University of Kerbala \ College of Nursing

Effectiveness of an Educational Program on Nurses' Knowledge and Attitudes toward Prevention of Viral Hepatitis Type B Infection at Kerbala Center for Cardiac Diseases and Surgery

A Thesis Submitted

By

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To the Council College of Nursing \ University of Kerbala, in Partial Fulfilment of the Requirements for the Master degree in Nursing Sciences

Supervised

Assist. Professor Dr. Selman Hussain Faris

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﴿ يَرْفَعِ اللهُ الَّذِينَ آمَنُوا مِنْكُمْ

وَالَّذِينَ أُوتُوا العِلْمَ دَرَجَاتٍ

وَاللهُ بِمَا تَعْمَلُونَ خَبِيرٌ ﴾

صدق الله العلي العظيم

سورة المجادلة الآية (١١)

Supervisor Certification

I certify that this thesis, which entitled (**Effectiveness of an Educational Program on Nurses' Knowledge and Attitudes toward Prevention of Viral Hepatitis Type B Infection at Kerbala Center for Cardiac Diseases and Surgery**), submitted by **Adil Mohammed Chyad**, was prepared under my supervision at the College of Nursing, University of Kerbala in partial fulfillment of the requirements for the degree of master in nursing Science.

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Dedication

Great thanks to Allah almighty .... To my dear father and to my beloved mother's soul, ... To my brothers and sisters with all love and respect who support me to pursue my study.... To my wife with love and respect forever ....

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Abstract

Hepatitis B virus (HBV) infection is considered one of the occupational risks that nurses face during the work. Therefore, preparing educational programs to improve nurses' knowledge and attitudes about HBV prevention will contribute to reducing the risk of infection. The study was conducted to evaluate the effectiveness of the educational program, on nurses' knowledge and attitudes about HBV infection prevention.

The study design was quasi-experimental, and implemented during the period from 1st November 2021 to 16th June 2022, at Kerbala Center for Cardiac Diseases and Surgery. A convenient sample of 50 nurses was divided into 25 nurses of the study group (included in educational-program), and 25 nurses of the control group(not-included in educational-program). The research tool used the multiple-choice questions to measure knowledge, and the Five-Way Likert scale to measure attitudes.

The study finding when comparison of the pre and post-program tests, for the study group' knowledge were, MS=(pre = 0.26,post = 0.95), p-value = 0.000, and for the attitudes were, MS=(pre = 2.91, post = 4.16),p-value= 0.000. While the results for the control group' knowledge were, MS=(pre= 0.26, post =0.28), p-value= 0.09, and for the attitudes were, MS=(pre = 2.89,post=2.99), p-value=0.177. The results showed significant relationship between the knowledge and some demographic data include (education level at p-value = 0.023, gender and participate in a training course at p-value=0.000 respectively), and significant relationship between the attitudes and some demographic data include (gender and participate in a training course at p-value = 0.000 respectively).

The study concluded the implementation of the educational program showed an improvement in the knowledge and attitudes of the

study group regarding the prevention of HBV infection, while the situation remained the same for the control group.

The study recommends that more efforts be made to prepare appropriate educational programs to improve and update the knowledge and attitudes of the nurses about HBV prevention.

List of Contents

List of Appendices

List of Figures

List of Tables

List of Abbreviations and Symbols

Items	Meaning
Anti-HBc	Hepatitis B core -Antibody
BBPs	Blood Borne Pathogens
CDC	Centers for Disease Control and Prevention
CDHB	Canterbury District Health Board
df	Degree of Freedom
DNA	Deoxyribonucleic Acid
ELISA	Enzyme-Linked Immunosorbent Assay
F	Frequencies
H	High
HAIs	Healthcare-Associated Infections
HAV	Hepatitis A Virus
HBcAg	Hepatitis B core Antigen
HBeAg	Hepatitis B e Antigen
HBIG	Hepatitis B Immune Globulins
HBsAg	Hepatitis B surface Antigen
HBV	Hepatitis B Virus
HCC	Hepatocellular carcinoma
HCO	Healthcare Organizations
HCV	Hepatitis C Virus
HCWs	Health care workers
HDV	Hepatitis D Virus
HEV	Hepatitis E Virus
HIV	Human immunodeficiency virus
HS	High Significant
IFN	Interferon
IPC	Infection Prevention and Control
L	Low
M	Moderate
MS	Mean Score
Neg.	Negative
No.	Number
NS	Non-Significant
OBE	Occupational Blood Exposure
OHS	Occupational Health and Safety

OSHA	Occupational Safety and Health Administration's
PCR	polymerase chain reaction
P value	Probability Value
PEP	Post Exposure Prophylaxis
PMTCT	Prevention of Mother-To-Child Transmission
Pos.	Positive
PPHSN	Pacific Public Health Surveillance Network
RNA	Ribonucleic Acid
RS	Relative Sufficiency
S	Significant
SD	Standard Deviation
SPs	Standard precautions
SPSS	Statistical Package of Social Sciences
STIs	Sexually Transmitted Infections
TTIs	Transfusion Transmitted Infections
t-value	observed T-test
WHO	World Health Organization
α	Alpha Cronbach
%	Percentage

Chapter One
Introduction

1.1. Introduction

Infection with the hepatitis B virus (HBV) is a major global public health hazard. HBV is the most frequent and dangerous type of infection, and it can lead to a persistent, lifelong infection of the liver. HBV infection caused a variety of hepatic disorders, including (acute or chronic hepatitis, liver- cirrhosis, and cancer of the liver (Abdi & Salleh , 2019).

Vaccination can prevent HBV infection, which is caused by the hepatitis B virus (HBV). Dr. Blumberg discovered it in 1965 and was awarded the Nobel Prize in Medicine in 1976 for his discovery (Pattyn et al., 2021).

Hepatitis B virus is a deoxyribonucleic acid (DNA) virus , and that belongs to a viral family called(Hepadnaviridae)(Gebrecherkos et al., 2020). It is estimated that 0.6 million people die from the acute or chronic effects of hepatitis B infection. About 25% of adults who are chronically infected as children die as adults from liver cancer or cirrhosis (liver scarring) caused by the chronic infection (Ahmed et al., 2018).

As a result, it is regarded as a life-threatening virus over the world, with high rates of fatality. HBV symptoms are indistinguishable from those of other hepatitis illnesses. Furthermore, many people may not exhibit any symptoms or may be suffering from a silent acute or chronic infection (Al-Sadeq et al., 2019).

Acute HBV infection does not necessarily result in symptoms. For instance, children under the age of five are unlikely to exhibit symptoms of infection. After infection, symptoms may take (one to six) months to manifest. It's possible that the infected person won't feel anything. Only about a third of persons with the disease are even aware

they have it. Only a blood test reveals the truth. Symptoms of chronic HBV infection are not always present, if they occur, they might resemble the signs of an acute infection(Nazario, 2020).

Hepatitis B virus is highly contagious and is spread through percutaneous or mucosal contact with infected blood, sperm, or other bodily fluids (Osei et al., 2019). For at least 7 days, HBV can survive and remain infectious on environmental surfaces (Steinmann et al., 2020).

Vertical and horizontal transmissions are the two main HBV transmission routes. At the time of birth, this infection is vertically transmitted from mother to newborn. The infection spreads horizontally via sharing dirty razor blades or needles, unsafe intercourse, and transfusion of contaminated blood (Alrabaiah et al., 2020).

Hepatitis B virus does not spread through the respiratory or gastrointestinal system. As a result, HBV cannot be spread through routine exposure in schools, workplaces, and other group settings, such as sharing computers and other office supplies, shaking hands and embracing, living in the same dormitory, dining in the same restaurant, and using the same bathroom (Wang & Duan, 2021).

Different stages of hepatitis B infection can be identified by the presence of specific markers like viral-antigens, antibodies against certain viral-antigens, or viral DNA. HBV infection can thus be identified serologically by observing for antibodies to the core protein (anti-HBc) or the (e-antigen), or by observing for HBsAg and HBV envelope antigen(HBe Ag) (anti-HBe). Most notably, polymerase chain reaction(PCR) can detect HBV DNA and viral load (Al-Sadeq et al., 2019).

There is no specific treatment for acute hepatitis B. As a result, the focus of treatment is on maintaining comfort, a balanced diet, and replenishing fluids lost as a result of diarrhea and vomiting (WHO, 2021).

Chronic hepatitis B has no cure, owing to the persistence of a viral minichromosomal that is not addressed by current treatments(Revill et al., 2020). Though present antiviral treatments can efficaciously decline replication of the virus, and in some cases, provide a sustained off treatment serological response, complete eradication of HBV infection remains the desirable goal (Nicolini et al., 2019).

Hepatitis B virus elimination needs interaction across five essential interventions (HBV vaccination, prevention of HBV transmission from mother to child; safety of blood and injections; services for individuals who use injected drugs that reduce harm, and expanded treatment & testing) according to the global strategy (Liu et al., 2019).

The global health region plan on HBV 2016 to 2021 was endorsed by the World Health Organization (WHO) assembly in May 2016, by applying these five basic interventions at a level of service coverage that is sufficiently high, the approach seeks to make HBV nonexistent as a public health concern by 2030 (Al Awaidy et al.,2020).

Universal children HBV immunization has been introduced in 187 countries since the first hepatitis B vaccine was released in 1981, accounting for 75% of global coverage among neonates. With the advent of the HBV vaccination, the occurrence of chronic HBV infection reduced considerably in most countries (Lin & Kao, 2021).To prevent HBV infection and development of chronic disease, a harmless and effective vaccine is accessible for every age group (Zhang & Zhang,2018).

The major targets of vaccination are newborns, babies, previously unvaccinated children and teenagers aged 15 years, as well as high-risk populations (Wang & Duan, 2021).

Healthcare –worker (HCW) including nursing staff is a person whose duties require them to come into connection with patients or their physique fluids (Lee J. et al., 2017). HCWs are more commonly than the general public at risk of contracting HBV infection from mucosal cutaneous contact with possibly infective blood (mouth, skin, or eyes) or from percutaneous contact with polluted shrill instruments (blades, needles, etc.) (Garzillo et al., 2020).

Healthcare –workers should be aware of the risks associated with such infections and take appropriate precautions. Other trainees, such as medical and nursing students, are also exposed to high levels of HBV infection, with the danger of accidental damage being extremely high due to a lack of expertise and abilities (Rehman et al., 2021).

Internationally the largest group of HCWs are nurses. They are an essential resource for providing safe and effective care to the world's population. More than any other healthcare provider, Nurses expend time with patients and their relatives when they are suffering from serious illnesses(Schroeder& Lorenz ,2018).

In the course of their daily work in the health-care setting, nurses are exposed to a significant risk of occupational risks and injuries. Nurses are at high risk of a variety of occupational risks, including infectious disease, due to the nature of their working environment, obligations, and activities (Kebede & Gerensea, 2018).

Standard precautions, increased percutaneous injury precautions, and HBV vaccination of HCWs have all been shown to lower the incidence

of occupational infections and prevent the virus from spreading in hospitals (Verso et al., 2019).

Standard precautions denote to the fundamental concepts of infection control used to protect health care workers from healthcare-associated infections. hand-washing, personal protective equipment, controlling sharp items, and managing patient related care tools are all examples of these precautions. They are, in fact, minimums for ensuring safety of health care at any ward, regardless of disease kind or severity (Nasiri et al., 2019).

Nursing staff's infection control procedures are efforts that safeguard them and their patients from hospital-acquired infections. As a result, whether or not the patient has a known or suspected infectious process, the nurse must apply standard precautions to all patients throughout the contact (Baqar et al., 2018).

Vaccination is the cornerstone of HBV prophylaxis, and it has been shown to lower the risk of infection to almost nil. Healthcare –workers who test negative for HBV should receive hepatitis B vaccine, but those who test positive for HBV should be treated (Omotowo et al., 2018).

All Healthcare –workers should be vaccinated against HBV, according to the Center for Disease and Control (CDC). Acute and chronic HBV infections are uncommon in vaccinated HCWs, while those who do not respond to the vaccine remain vulnerable to infection (Babanejad et al., 2019).

Effective HBV infection prevention is the result of a high level of knowledge, a positive attitudes, and strong HBV infection prevention practice. In this situation, knowledge of HBV infection prevention refers to knowledge of the etiology of HBV infection, its transmission, diagnosis,

clinical signs and symptoms, diagnosis, management, treatment, immunization, complications, and the presence of post exposure prophylaxis for the treatment of accidentally exposed individuals. In this setting, attitudes toward hepatitis B infection prevention are based on perceived susceptibility-risk, severity, and danger of HBV infection (Balegha et al., 2021).

Many research have demonstrated the importance of educational activities in enhancing knowledge and changing attitudes. Changes in professional practice and, in some cases, health care outcomes can be influenced through interactive continuing education courses that increase participant involvement and allow opportunities to practice skills. As a result, nursing personnel should be appropriately educated in the fundamentals of infection control and should get ongoing training to keep their knowledge and abilities up to date. Periodic seminars are held for HCWs as part of their ongoing infection control training (Gaikwad et al., 2018).

Other socio-cultural characteristics within impacted areas that endure to stymie progression toward hepatitis B elimination, such as patients' insufficient knowledge of HBV, and HBV- associated stigma, could be mitigated by HCW training. When Nurses and other HCWs are well- trained, they are poised in their ability to share their knowhow with their societies and to provide correct and competent advice to the general population and individuals seeking services (Nankya-Mutyoba et al., 2022).

Uptake of HBV infection prevention actions such as HBV screening, HBV immunization, antibody testing after HBV vaccine, gloves change for each client, needles not being recapped after usage, avoidance of needle stick and sharps injuries, and avoidance of blood and contaminated body fluids splashes on the body is a good practice of HBV

infection prevention. Following health education, high knowledge with a favorable attitude toward HBV prevention, mediated through pertinent socio- demographics, have been shown to be definitely connected to effective disease prevention practice, which is hypothesized to result in desired HBV prevention outcomes (Balegha et al., 2021).

1.2 Importance of the Study

Globally, Infection remains a major problem and public health concern in all hospitals and health-care organizations around the world. It is seen as a major problem since it causes to a high rate of morbidity, mortality, and higher costs. The goal of infection prevention strategies is to ensure that the vulnerable population is protected from hepatitis B virus infection. During therapy, these risk groups can come from both the community and hospitals (Rehman et al., 2021).

Hepatitis B virus is a serious worldwide health concern. It leads to an increased risk of cirrhosis and liver cancer, as a result of the infection turning into a chronic infection. HBV is a serious liver disease due to its progression to liver cancer. With 1.5 million new cases annually, the WHO estimated that 296 million people had chronic HBV infection in the same year. An estimated 820000 people died from HBV in 2019, primarily from cirrhosis, and primary hepatocellular cancer (WHO,2021).

Iraq has a low endemic rate of HBV when compared to its neighbors. In the city of Karbala Because of the efficiency of a vaccination program that required all six-year-olds to get vaccinated against HBV as a condition of entering school, the prevalence of HBV dropped in 2008–2010. Because of the massive migration to holly Karbala governorate as a result of ISIL attacks in some northern Iraqi cities, the prevalence of HBV has increased in the governorate since 2011(Merzah et al., 2019).

The healthcare-workers they deal with blood and other bodily fluids on a regular basis are at a higher risk of contracting blood-borne viruses like HBV. Around two million HCWs are exposed to HBV each year, with roughly 70000 becoming infected. Increase the momentum of patients in hospitals , decreased ratio of health care workers to patients ratio, inadequate or absent essential equipment for safety and protection, reusing \ reprocessing sharp objects and contaminated needles, limited knowledge of the dangers associated with exposure to blood and other fluids, all these factors collectively raise the risk of occupational infections in developing nations(Akazong et al., 2020).

These exposures are widespread during major and minor surgical procedures, everyday clinical and nursing activities such as simple physical examinations, handling laboratory specimens, and disposing of hospital trash, as well as accidents and life-saving emergency procedures (Arinze Onyia.,et al., 2020).

The cardiac interventional (cardiac catheterization) laboratory is a possibly dangerous location if appropriate safety precautions are not taken. Occupational contact to blood and other fluids is one of these hazards. While performing procedures such as IV therapy in a cardiac intervention laboratory, various blood exposure dangers such as (needle stick injury, blood splashing on skin, mucous membrane contact) may occur. Administration of local anesthetic, arterial puncture, catheter insertion or exchange, catheter flashing, catheter removal and groin, and contact with soled linen or equipment (Sorajja et al., 2021).

Nurses are an important element of the healthcare team. As a result, they must have a thorough understanding of Hepatitis-B infection, including its modes of transmission, clinical features, complications, and various preventive measures that should be taken, in order to take the

necessary precautions to prevent the disease and to raise knowledge about the disease among the general public, patients, and other health-care professionals (Anand et al., 2020).

The majority of people around the world are at risk of contracting Hepatitis B. Routine contact with blood, a lack of knowledge about prevention and control measures, a negative attitude, and a lack of practices are all factors that contribute to this high risk (Rehman et al., 2021).

Therefore, this study was conducted to investigate the effectiveness of an educational program on nurses' knowledge and attitude toward prevention of hepatitis type B virus infection.

1.3. Statement of the Problem

Effectiveness of an Educational Program on Nurses' Knowledge and Attitudes toward Prevention of Viral Hepatitis Type B Infection at Kerbala Center for Cardiac Diseases and Surgery.

1.4. Objectives of the study

1- To assess the nurses ' knowledge and attitude toward prevention of hepatitis B virus infection.

2- To construct an educational program for the nurses toward prevention of hepatitis B virus infection.

3-To evaluate the effectiveness of an educational program on the nurses' knowledge and attitudes toward prevention of viral hepatitis B infection.

4- To find out the relationship between the nurses' knowledge, attitudes with their demographic characteristics(age, gender, experiences, level of education, and participate in a training course).

1.5. Definition of Terms

1.5.1. Effectiveness

A. Theoretical Definition:

Is an adjective denoting that a particular action or event is generally adequate to accomplish some purpose(Scott et al., 2012).

B. Operational Definition:

The degree to which an education program will influence the knowledge and attitude of nurses in the center for cardiac diseases and surgery.

1.5.2. Educational Program

A. Theoretical Definition:

Written and crafted instructional materials provided to the subject or person to enhance or motivate their comprehension of particular pertinent issues (Ochako, 2019).

B. Operational Definition:

It is a group of educational actions prepared to succeed a pre-determined objective or to complete a definite set of educational tasks related to the knowledge and attitude of nurses in the center for cardiac diseases and surgery.

1.5.3. Knowledge

A. Theoretical Definition:

It refers to the theoretical and practical understanding of a subject (Sen Gupta, 2021).

B. Operational Definition:

The degree to which the nurses perceived principles and information concerning prevention of viral hepatitis B infection.

1.5.4. Attitudes

A. Theoretical Definition:

The pattern of feelings, beliefs, and reactions that an individual holds regarding particular people, objects, or ideas and are often formed based on an individual's past experience(Boyle et al., 2010).

B. Operational Definition:

Nurses feeling or opinion or behavior toward prevention of hepatitis B virus infection .

1.5.5.Prevention

A. Theoretical Definition:

Measures aimed at avoiding disease (including infection), halting its progression, and minimizing its consequences once it occurs (Outwater et al., 2017).

B. Operational Definition:

Measures aimed at avoiding the occurrence of hepatitis B virus infection.

Chapter Two

Review of Literature

Review of Literature

2.1. History of Hepatitis B virus

History of hepatitis B virus (HBV) is intriguing and spans thousands of years. When these germs first infected people, a natural recurring cycle occurred began, capable of spreading infection to millions of individuals, killing thousands of people and decimating the population. There are reports of jaundice epidemics five thousand years back in China and 2,500 years ago or more in Babylon (Fonseca, 2010).

This clear physical sign is documented on Babylonian mud tablets and mentioned in the old testament, but the prolonged time intermission, measured in weeks, between exposure to the pathogenic cause and the progress of disease prevented jaundice from being recognized as an infectious condition until recently. Despite the fact that Hippocrates reported several situations and offered numerous reasons and cures , and adopt the terms (kirros, ikteros) in his explanations, he mistakenly believed that jaundice was caused by a humoral disorder and was unaware that the disease could be transmitted from a person to person (Block et al., 2016).

Written evidence of epidemic jaundice outbreaks can be traced back several millennia before Christ. Owing to the connection of numerous sources perhaps related to distinct an etiologies, such as epidemic jaundice (viral hepatitis A or E) and serum hepatitis (viral hepatitis B or C) there is unavoidable confusion (Craxi, 2012) .

Great jaundice epidemics and pandemics have a tragic past, and they are frequently linked to significant wars. 40,000 cases were reported among union troops during the American civil war. Following smallpox immunization,191workers at the Bremen shipyard (Germany) had catarrhal

jaundice in 1885. After receiving the yellow fever vaccine in 1942,28,585 soldiers fell afflicted with hepatitis (Fonseca, 2010).

Hepatitis B virus was one of the first blood-borne diseases to be discovered in humans (Okonkwo et al., 2018). In1965, Dr. Baruch Blumberg identified the Australia antigen, which was finally discovered as the hepatitis B surface antigen (HBsAg).The Nobel Prize in Physiology or Medicine was given to Dr. Blumberg in 1976 for his contributions (Zhao et al., 2020).

In fact, decades before Dr. Blumberg's key breakthrough, scientists had been studying the pathogenesis of viral hepatitis. Among the greatest physicians of the nineteenth century was Dr. Rudolf Carl Virchow, presented an authorized description of the transmission of "catarrhal jaundice" through humanoid serum, which Hippocrates had reported (Bousali et al., 2021).

Depending on the exposure method and the interval of the incubation period, the difference between short incubation or (infectious) and lengthy incubation or (serum) hepatitis was unmistakably identified, around the 1920s, however scientists were incapable to produce an infectious agent or duplicate any disease in lab animals (Block et al., 2016).

The designations (HAV & HBV) were first used in 1947. After notes of cirrhotic patients who had previously recovered from an episode of catarrhal jaundice many years prior and had no history of alcoholic liver disease, and chronic hepatitis was initially identified around 1940s, but it wasn't until the invention of liver function testing around 1950s that an-icteric infections and chronic carriers were identified(Bousali et al., 2021) .

Various liver function tests were developed over the two decades that followed, revealing the occurrence of an-icteric hepatitis and a large number of chronically sick people, however the triggering factors remained unknown . In 1965, Blumberg with his colleagues identified an uncommon band on a double diffusion gel, There had been enormous accumulation of epidemiologic and clinical information, alongside thousands of frozen serum samples, enabling quick advancement through the development of an HBV-specific diagnostic test (Block et al., 2016).

Following the "Australia antigen" was identified, the enormous amount of recorded clinical and epidemiological information, in addition to the enormous quantity of serum samples that are kept in storage, accelerated the comprehension of HBV, and made clear that there are a great number of persons who are chronically afflicted in many different parts of the globe (Bousali et al.,2021). Blumberg and Millman created the first HBV vaccine in 1969 using a heat -treated version of the disease(Das et al., 2019) .

In 1972, the first vaccine against HBV was available (Bousali et al.,2021). HBV vaccine made from plasma by Merck Pharmaceuticals, this entailed virulent particles in blood from donors who tested positive for HBsAg being inactivated, was granted a license in 1981 through the US Food and Drug Administration. In 1986, an extremely purified HBV vaccination that was genetically engineered (or recombinant DNA) and did not include any blood components was created. The World Health Organization recommended in 1991 that all nations incorporate vaccine for HBV into their country's vaccination programs (Das et al., 2019).

The first interferon clinical study for treating chronic hepatitis B began in 1986. In 1998, lamivudine was approved as the first directly

acting antiviral through the US Food and Drug Administration (Bousali et al., 2021).

2.2. Overview of the Hepatitis

Hepatitis is a broad term that refers to liver inflammation. A viral infection is the greatest frequent reason for hepatitis. Viral hepatitis types A, B, C, D, and E, are the greatest prevalent kinds. Epstein-Barr virus, cytomegalovirus, herpesvirus, coxsackie virus, and rubella virus are additional viruses that can cause hepatitis. Chemicals and medicines, autoimmune diseases, metabolic issues, and genetic anomalies can all cause hepatitis(Lewis et al.,2019).

Hepatitis can have both local and systemic consequences. The inflammatory process causes the liver to enlarge on a local level. When the edema is extreme, two things happen. The bile channels are first squeezed, which damages the bile-producing cells. This causes jaundice and an increase in serum bilirubin. Second, blood flow via the liver is impeded, resulting in an increase in portal circulation pressure. Systemic effects are linked to the liver's normal metabolic functions as well as the infectious response in viral hepatitis (Linton & Matteson, 2020).

Viral hepatitis is an infection with a virus that results in the inflammation and necrosis of hepatic cells, causing a variety of metabolic, cellular, and clinical complications. The fecal-oral method of transmission is the same for hepatitis A, and E, while hepatitis B, C, and D have a lot of similarities. Hepatitis is easily transmitted and results in significant morbidity and time away from school or work (Hinkle & Cheever, 2018).

The presence of antigens and the subsequent production of antibodies to them are the only definitive ways to discriminate between the

various kinds of viral hepatitis. Even if a person is immune to one virus, they can contract another type of viral hepatitis (Lewis et al., 2019).

Hepatitis B virus is a DNA virus with an envelope that causes hepatic inflammation. It can cause acute or chronic hepatitis, as well as abrupt liver failure, often known as fulminant hepatitis. Acute hepatitis is typically a symptomatic, self-limiting condition that does not require treatment. Chronic hepatitis, on the other hand, is typically asymptomatic until problems such as acute flares, cirrhosis, and malignancy develop (Okonkwo et al., 2018).

Hepatitis B virus is an illness that must be reported. Infection with HBV is transmitted when contaminated blood or other body fluids are directly touched (Ross & Furrows, 2014).

2.3. Epidemiology of Hepatitis B virus & Global Geographic Distribution

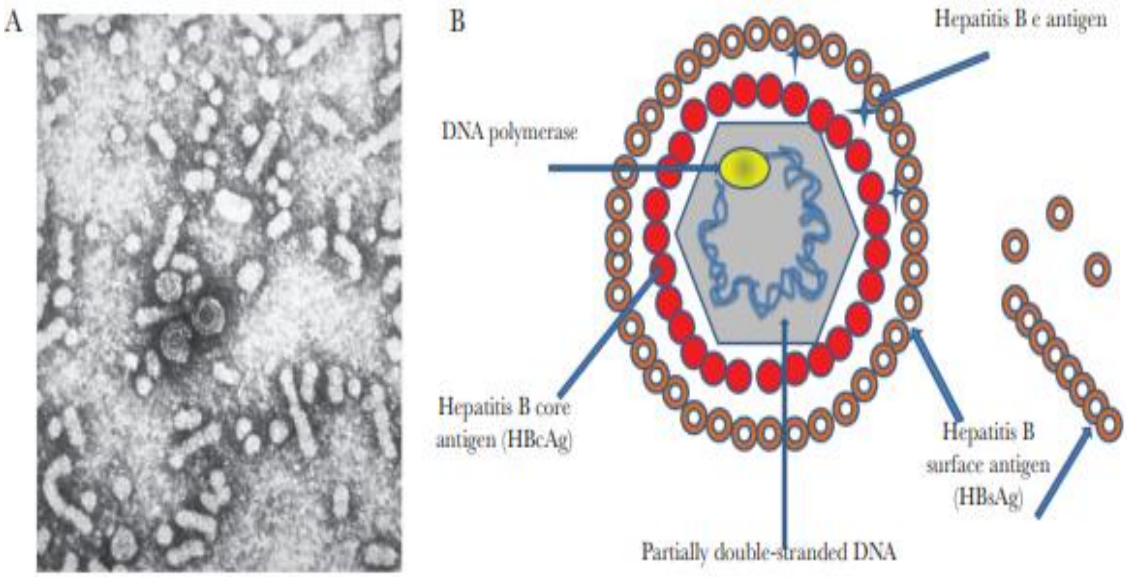
The WHO estimated that (296) million persons have chronic HBV in 2019, with(1.5) million new cases reported annually . In 2019, 30.4 million people (about 10% of all hepatitis B infected people) knew they had the disease, while(6.6) million persons (22 % of those diagnosed) take therapy. In 2019, there were 820,000 deaths from HBV, most of which were brought on by hepatocellular malignancy (primary liver carcinoma) and cirrhosis (WHO, 2021).

Countries are classified based on the prevalence of chronic HBV into (high prevalence (≥ 8%), intermediate prevalence (5%–7.9%), low intermediate prevalence(2%–4.9%), low prevalence (≤1.9%). According to this classification, Iraq is among the countries with low prevalence of chronic HBV (Schillie et al., 2018).

With 116 million and 81 million chronic cases, respectively, the Western Pacific and African areas have the highest burden of HBV infection. HBV is a chronic infection that affects an estimated 60 million persons in the Eastern Mediterranean region. The burden of chronic infection is lower in Southeast Asia, Europe, and the Americas, where an estimated 18 million, 14 million, and 5 million persons, respectively, have chronic infection(WHO, 2021).

2.4. Description of Hepatitis B Virus

Hepatitis B is a possibly deadly liver infection that is brought on by the hepatitis B virus. It is a serious problem for world health. It can cause a chronic disease and raises the risk of dying from cirrhosis and liver carcinoma (WHO, 2021). HBV is a tiny enveloped hepatotropic DNA virus that is a member of the Hepadnaviridae family. (Zhao et al., 2020).



Figure(2-1) A\ HBV electron micrograph, B\ HBV particle & surface antigens in a simplified diagram (Pattyn J.,et al., 2021)

Hepatitis B virus is a virus with a 40–42 nm envelope. The DNA genome of HBV is circular and partially double- stranded with a length of 3.2 kb. The virus enters the liver through the circulation once a vulnerable

person is exposed. HBV is divided into two classification systems: serologic subtype and genotype. A–J are the ten HBV genotypes that have been identified. Geographically, HBV serotypes and genotypes differ. Immunity to all genotypes is often conferred by infection or immunization with one genotype (Schillie et al., 2018).

Hepatitis B virus produces a small numeral of viral proteins or antigens that can be distinguished in the blood (see fig. 2-1). Antibodies to each antigen may develop in response to HBV infection. The HBV surface antigen (HBsAg) is the virus's outside protein coat. Although the HBV core antigen (HBcAg) is not found in the blood but only in the liver, its antibody (anti-HBc) can be detected and its presence in the blood suggests infection. HBV e antigen (HBeAg) is the virus's third protein excreted. Its presence is linked to high viral infectivity and active viral replication. However, the absence of HBeAg does not automatically rule out active disease, since some persons can have mutant viruses that are unable to express e antigen, resulting in active e antigen negative chronic HBV(Lewis et al., 2019).

2.5. Hepatitis B Virus Transmission

Hepatitis B virus infection is greatest frequently transmitted during childbirth, from mother to baby (perinatal transmission)or horizontally(exposure to contaminated blood), in particular, from an infected child to a healthy child , in regions where the disease is endemic. Babies infected through their mothers or beforehand the age of five are more likely to develop chronic infection. The incubation period for hepatitis B virus is an average of 75 days, but it can range from 30 to 180 days (WHO, 2021).

Hepatitis B virus is highly infectious, can be remain infectious for at least 7 days on environmental surfaces and spread without observable

blood. All (HBsAg) positive people are infectious, however individuals with increased HBV- DNA or HBV e antigen (HBeAg), HBV protein that is present in the blood that is measure of infectivity,bare the greatest infectious (Schillie et al., 2018). Hepatitis B virus is not transmitted through water, food, insects, or other infected vectors (Kumari et al., 2019).

In the world, there are two major forms of hepatitis B virus transmission: perinatal (vertical) transmission and horizontal transmissions (Katamba &Philippe, 2021).

Vertical transmission of HBV is characterized as transmission from a mother infected with HBV to the fetus or child during pregnancy and the perinatal period , resulting in (HBV (HBsAg) or HBV- DNA) positivity in newborns at 6-12 months of age. Micro transfusions can happen during pregnancy, labor, or delivery. Maternal micro infusions could be linked to placental leakages caused by imminent premature abortion or birth , extended uterine contractions, amniocentesis . During labor and delivery, the newborn may be exposed to cervical secretions and blood infected with HBV (Veronese et al., 2021).

Horizontal transmission is the second mode of transmission, which can happen as a result of exposed wounds (scratches and cuts), inadequate infection control measures in health facilities to prevent blood-borne infections , blood transfusions, sexually transmittable , and risky health activities like body-piercing, unsafe drug injection, tattoos, and scarification with unsterilized instruments and other equipment (Katamba & Philippe, 2021).

Sharing tools like glucose test device, toothbrushes, and shaving blades with an individual who is infected could cause damage to the

mucous membranes or skin and increase exposure to infected blood. (CDC, 2021).

Transfusion of blood is an important element of medical therapy and care. Safe, timely, and adequate transfusion thousands of thousands of lives. Yet, the risk of transfusion-borne infections (TTIs) is increased by unsafe blood transfusions and a large number of life-threatening consequences. HBV (hepatitis B virus), HIV (human immunodeficiency virus), HCV (hepatitis C virus), malaria, and syphilis are the most frequent TTIs (Rawat et al., 2017).

The most serious hazards to blood safety are HBV and HCV. This is owing to their capacity to produce persistent (often asymptomatic) infection, which can lead to long-term consequences such liver cirrhosis and hepatocellular cancer (Dahl .,et al., 2020).

Hepatitis B virus is transmitted by semen, blood, and other fluids of the body. Adults with risk behaviors, such as having several sex partners and sex partners of those suffer from chronic illness, are the most vulnerable to HBV transmission. HBV is easily transferred through sexual activity, in fact (Lu et al., 2021).

Recurrent partner exchange, recurring sexual connection with an HBV- positive individual, and homosexual relationships, all enhance the risk of HBV infection transfer during sexual intercourse (Drazilova et al., 2020).

For at least 7 days, HBV replication can be achieved at room temperature so it can be transmitted percutaneous. It's possible that the virus can spread from persons with persistent infections to surfaces via torn skin and mucosa, infecting other people with open sores. Non-sterile devices and methods can also spread the virus, such as medicine injections,

tattoo, and so on. Transmission, which can be caused by poor infection protection methods in health care settings (Katamba & Philippe, 2021).

Healthcare systems must give priority to the prevention of healthcare-associated infections (HAIs), which pose a severe threat to the safety of patients and healthcare workers (Alhumaid et al., 2021).

Healthcare-associated infections is the greatest communal adversative happening in healthcare globally, each year, they can impair the standard of care for millions of patients in equally developing and developed nations as a result of epidemic or endemic situations. These infections increase costs, mortality, morbidity, as well as pose a significant risk to patient safety and public health (Geberemariyam et al., 2018).

Healthcare-associated infections potential to reduce life expectancy or can reduce an individual's quality of life, and incur significant long-term costs. HAIs were found to be (0.3%) to HIV, (3%) to HCV, and (6-30%) to HBV after exposure to injury with a needle-stick injury from a patient who was infected. Each year, out of 35 million HCWs globally, 3 million are exposed to blood borne pathogens (BBPs), with 2 million of them exposed to hepatitis B virus (Alhumaid et al., 2021).

2.6. The Relationship between Hepatitis D & Hepatitis B

Hepatitis D virus infection occurs in some cases of HBV. Only those with HBV are at risk for HDV because the virus requires HBsAg to replicate. Anti-delta antibodies confirmed the diagnosis in the presence of HBAg on testing (Hinkle & Cheever, 2018).

Hepatitis D virus (HDV), is ribonucleic acid (RNA) virus with a single-stranded usually identified as (Delta virus),with a flaw that prevents it from surviving on its own (Lewis et al., 2019).

People can contract both the HBV and the HDV viruses at the same time known as (co-infection), or they can contract HDV after contracting the HBV virus known as (super-infection). HDV is not preventable by vaccination. HBV vaccination, on the other hand, protects against HDV infection in the future (CDC, 2020).

Co-infection with HBV and HDV can result in fulminant hepatitis and more serious disease than HBV infection alone. Anti-HDV (HDV antibody) testing confirms HDV infection, whereas HDV-RNA demonstrates active disease. HDV, like HBV, is transferred through the skin (Lewis et al., 2019). Hepatitis D virus raises the chances of the patient developing chronic hepatitis and eventually dying of liver failure (Linton & Matteson, 2020).

Hepatitis D virus is common in those who use IV or injectable drugs, hemodialysis patients, and people who get multiple blood transfusions. Sexual interaction with people who have HBV is thought to be a major mechanism of hepatitis B and D transmission. The incubation phase might last anything from 30 to 150 days. HDV symptoms are identical to hepatitis B symptoms, with the exception that individuals are more prone to develop fulminant hepatic failure, chronic active hepatitis, and cirrhosis. Treatment is the same as for other types of hepatitis (Hinkle & Cheever ,2018).

2.7. Hepatitis B Virus Phases

2.7.1. Acute Hepatitis B Virus Phase

Acute HBV is a short- term disease that appears after exposure to the HBV within the first six months. Acute HBV may be asymptomatic or only mild in some individuals . Some people infected with acute HBV

develop more severe symptoms and they need to be hospitalized (CDC, 2021).

Most people who are acutely infected, particularly newborns and small children born to moms who have HBV, have no symptoms. The percentage of infected patients whose infection does not resolve and becomes chronic after an acute infection varies with age. Up to 90% of neonates infested with HBV at birth progress chronic disease (Lewis S., 2019).

Acute infections may be range in severity from mild or asymptomatic disease to fulminant hepatitis which occurs just in rare cases. The disease is more severe in persons over the age of 60 (CDC, 2022).

Furthermore, HBV transmission is unlikely to be caused by acute HBV. However, the continued occurrence of acute HBV in adults suggests that current approaches to prevent HBV transmission are insufficient and that further preventative efforts are required (WHO, 2020).

2.7.2. Chronic Hepatitis B Virus Phase

Chronic HBV is more important than acute HBV in terms of public health because it causes long-term morbidity and death, and it serves as a reservoir for HBV transmission to a susceptible host (WHO, 2020).

When some individuals become infected, especially those who contract the infection as adults, are able to rid their bodies of infection and do not need treatment. Other individuals, acute HBV develop to a lifelong infection. Over time, chronic HBV can cause serious health problems such liver cirrhosis, damage, hepatocellular carcinoma, and to death even. The hazard of developing a chronic infection varies with infection age and is

highest in infants and young children. Nearly 90% of infants and 25%-50% of children aged one to 5 years will continue to have chronic HBV infection. Adults, on the other hand, recover entirely from HBV infection and do not develop a chronic infection in roughly 95% of instances(CDC, 2022).

Chronic HBV has a very diverse and complicated course. Some infected people experience remissions and exacerbations of inflammatory activity in the liver, whereas others have constant active inflammation or no inflammation at all. In those who were infected at a young age, the course of a chronic HBV infection can be split to four stages,(immune - tolerant stage, an inactive stage, immune clearance stage, and reactivation of HBV infection stage) (Lewis et al.,2019).

The stages of chronic HBV infection are not always in that order. This based on serological and biochemical data.(Wiegand et al., 2019).

2.8. Hepatitis B Virus Sign &Symptoms

Hepatitis B virus has two types of clinical manifestations: acute and chronic hepatitis. Many people with acute hepatitis show no signs or symptoms. Immunocompromised people may have no signs or symptoms. As a result, many serious infections go undiagnosed (Lewis et al., 2019).

Hepatitis B virus is clinically similar to HAV, although the incubation period is substantially longer (1 to 6 months) HBV symptoms and signs might be subtle and varied (Hinkle & Cheever, 2018).The discrete onset of symptoms is considered acute hepatitis(Wilkins et al., 2019).

Sometimes Most children under the age of five, as well as those with major health conditions (such as weakened immune systems),

experience no symptoms. Up to (50%) of the elder children, teenagers, and adults have acute HBV symptoms effects. Fatigue, fever, anorexia, vomiting, nausea, discomfort in the abdomen, clay-colored stools, dark urine, yellow hue in the eyes or skin (jaundice), and joint pain are all symptoms of acute HBV (CDC, 2022).

The liver may be painful and grow to a vertical size of 12 to 14 cm. In a few cases, the spleen is enlarged and palpable, and the posterior cervical lymph nodes may also be enlarged. Subclinical events are also common (Hinkle & Cheever, 2018).

Most patients with chronic HBV asymptomatic, they don't impression sick, and can live tens of years without feeling any symptoms. If symptoms do materialize, they resemble those of an acute infection but may signify a severe liver condition(CDC, 2022).

The quantity and intensity of symptoms vary greatly from one person to the next. Chronic hepatitis is marked by a long recovery period marked by persistent fatigue and liver enlargement that gradually disappears. Symptoms and signs last longer than 6 months (Linton & Matteson, 2020).

2.9. Diagnosis of Hepatitis B Virus

Since it is impossible to differentiate HBV from hepatitis brought on by different viral agents according to clinical conditions, there must be laboratory confirmation of the diagnosis. Several blood tests can be used to detect and track HBV. They can be used to distinguish between chronic and acute HBV. Focus is placed on finding the surface antigen (HBsAg) of the HBV infection during laboratory diagnosis (WHO, 2021).

To Identify if a person has chronic or acute HBV infection, requires post-test care referrals and guidance, is protected against HBV due to a past infection or immunization, or needs vaccination since it is prone to infection, There are three separate serologic tests needed hepatitis surface antibody (anti-HBs), hepatitis surface antigen (HBsAg), and total hepatitis B core antibody (anti-HBc) (CDC, 2022)

The definitive marker of HBV infection is HBsAg. Chronic HBV infection is defined by the presence of HBsAg for at least 6 months. Screening should be performed using both HBsAg and anti-HBs. (Lee & Kim,2021).

A person infected with the virus will have detectable (HBsAg) in their blood for an average of four weeks (range 1-9 weeks) after becoming infected. By 7weeks following beginning of symptoms, about half of infected person will no longer be infectious , and all individuals who are not chronically infection will be (HBsAg) negative by 15 weeks following the beginning of symptoms(CDC, 2022).

2.10. Hepatitis B Virus Treatment

There isn't a specific treatment for acute HBV. Due to this, the focus of treatment is on maintaining comfort and a balanced diet, in addition to replenishing fluids lost as a result of diarrhea and vomiting. The greatest important object is to abstain from using unnecessary medicines. Avoid using paracetamol, acetaminophen, and antiemetic. Medications can be used to treat chronic HBV infection, especially oral antiviral drugs (WHO, 2021).

The goal of treatment is to reduce viral load and liver enzymes while also reducing disease progression. Cirrhosis, liver failure, and

hepatocellular cancer are all long-term objectives. Current HBV medication regimens inhibit the virus but do not eradicate it. Interferon (IFN) and oral antiviral medications are used to treat chronic HBV. IFN contains antiviral as well as immunomodulatory properties(Lewis et al., 2019).

The oral treatments Entecavir or Tenofovir are the greatest effective drugs to block the HB, as stated by the WHO. Most HBV patients who start treatment must continue it for the remainder of their lives. People with liver cancer or cirrhosis may have transplantation of the liver on occasion in high-income countries, with varying grades of success (WHO, 2021).

2.11. Complications of Hepatitis B Virus Infection

Individuals who have acute hepatitis can get acute liver failure, that might result in death. HBV infections can result in a variety of long-term complications, some people get advanced liver diseases, for instance, liver cancer and cirrhosis, may result in significant mortality and morbidity. HBV complications include(Fulminant hepatitis(<1%), Hospitalization, Cirrhosis, Hepatocellular carcinoma, Death)(Kroger, 2020).

2.12. Adults at Risk for Hepatitis B Virus Infection

2.12.1.Injection-Drug Use

Sharing needles and drug use paraphernalia puts persons who use injected drugs at hazard of exposure to the HBV (Haussig et al., 2018).

2.12.2. Sexual Exposure

The main cause of persistent HBV infection has been recognized as sexual transmission. Sexually active people, particularly those with

sexually transmitted infections (STIs), are at a greater risk of developing chronic HBV infection (Yewande et al., 2018).

2.12.3. Household Contact

Hepatitis B virus transmission in the home is a greatest important concern for public health. The home contacts of HBV carriers have a high occurrence of HBV infection. HBV infection is spread mostly through parenteral and sexual exposure. During the perinatal period, vertical transmission happens from an infected mother to her child. Furthermore, horizontal spread of HBV infection among close contacts is well documented as a route of transmission (Yousef et al., 2021).

2.12.4.Long-Term Care Facilities for People with Developmental Disabilities

In comparison to the general community, patients at facilities for mental health care have a higher chance of contracting HBV. In a research conducted in Spain in 2000 with the goal of establishing the prevalence of HBV in patients who had been hospitalized for a long time in mentally challenged care centers, 81.3% of patients tested positive for HBsAg (Sarbandi et al., 2020) .

2.12.5.Correctional Facilities

Correctional facilities are a site in which people with unknown health condition may spread contagious diseases. Drug users who inject drugs, as well as persons who share a clipper, or nail clipper, and/or persons who participate in homosexual behavior, are very likely to contract one of the many blood transmission diseases, including HBV (Alkali et al., 2017).

When inmates are released back into the community, transmissible infectious diseases may have an influence on the general public's health, necessitating infection surveillance in correctional facilities (Sullivan et al., 2021).

2.12.6. Healthcare worker at Risk for Occupational Exposure to Hepatitis B Virus

A healthcare worker (HCW) is someone whose job requires them to come into touch with patients or their body fluids. Physicians, nurses, pharmacists, dentists, technicians, students, emergency responders, professionals in public safety, providers of first aid, workers in the health care waste, and volunteers (Lee et al., 2017).

Direct contact with infection Substances, particularly blood or body fluids infected with the HBV, is the greatest risk factor for HBV infection in healthcare workers. According to some research, these personnel are unaware of the HBV and do not take enough precautions against blood-borne diseases (Muljono et al., 2018).

The sexual spread of HBV has been linked to sperm and vaginal fluids. HBsAg, which is usually a sign of active HBV, can as well be identified in additional bodily fluids (e.g., bile, mother's milk, sweat, and stool). However, because greatest bodies' fluids contain tiny amounts of infectious HBV, they are ineffective transmission vehicles (unless they contain blood). Unless sputum, urine, or vomitus contain blood, they are not regarded potentially contagious (Schillie et al., 2013).

The blood of HBV patients has the greatest HBV level of all bodies' fluids and is the greatest common source of hospital infection transmission. Synovial fluid, cerebrospinal fluid, pleural fluid, pericardial

fluid, amniotic fluid, and peritoneal fluid are among the fluids that could be infectious (Yasin et al., 2019).

World Health Organization stated that, around the world,(3,000,000)of health workers are percutaneously exposed to blood-transmission diseases each year (170,000 to HIV, 900,000 HCV, and 2,000,000 for HBV). Arise from these injuries, (500) HIV infections, (15,000) HCV infections, and (70,000) HBV infections. Furthermore, occupational blood exposure (OBE) cause significant psychological stress, such as work-related sadness, as well as significant managerial expenditures(Lee et al., 2017).

Hepatitis B virus has been identified as an occupational risk because the virus may survive for long times of time on surfaces and can be transmitted even when there is no observable blood. Unlike the probability of HIV and HCV spreading after a percutaneous injury (0.3 % and 1.8 %, respectively), the risk of HBV transmission commonly ranges from (6 - 30%). HBV is a well-known danger for health-care professionals who work with blood and blood products (Nemr et al., 2018).

2.12.7. Patients on Hemodialysis

The extensive frequency of these infections in hemodialysis patients is due to the existence of common risk factors such as a great numeral of blood transfusions , polluted equipment , and substantial contact with infectious patients. As a result of the immunological deficiency experienced by hemodialysis patients, blood-transmission viral infections, notably HCV and HBV, are a leading reason of mortality and morbidity in these patients(Ingin et al., 2021).

2.12.8. Persons with Hepatitis C Virus

Patients in endemic nations by HBV or HCV are at risk of co-infection with both viruses. HCV/HBV co-infection could also be transmitted via parenteral viral transmission. The chance of developing hepatic illness in persons suffers from both HBV and HCV is increased. Cirrhosis and hepatocellular carcinoma are more common in people who have mono-infection of the liver. virus or both Hepatitis C and B co-infected patients must be monitored on a regular basis (Shih & Liu, 2021).

2.12.9.Persons with Chronic Liver Diseases

If not they have mucosal or percutaneous contact to bodies' fluids or blood, those how have chronic hepatic diseases(autoimmune liver disease, fatty liver, drinking-related hepatic damage, and cirrhosis) are not at an enlarged danger of infected with HBV. Concurrent chronic HBV infection, on other hand, may raise the risk of developing chronic liver diseases in these people (Schillie et al., 2018).

2.12.10. Persons with Human Immunodeficiency Virus (HIV)

There are (2.700.000) HBV patients who simultaneously have HIV, or around 1 % of all HBV patients. Among those with HIV, the worldwide occurrence of HBV infection is 7.4% (WHO, 2021).

2.12.11.Persons with Diabetes

Diabetes patients are more likely to contract parenterally transmitted viruses such as hepatitis B or C because they are frequently hospitalized and subjected to blood testing such as blood glucose monitoring (Villar et al.,2019).

Diabetics should check their blood sugar at least once monthly, anyway of whether they are on insulin, oral medications, or nutritional therapy. Monitoring is carried out in hospitals, physician clinic, facilities for assisted living, schools, and all places where supported monitoring is done. When exposed to infected people's bodily fluids such as blood by polluted surfaces or equipment (e.g., when more than one individual uses an insulin pen or by glucose meter), HBV transmission can occur (Zhang et al.,2019).

Although there have been reports linking lapses in infection control to HBV transmission in healthcare settings, research in the United States reveal that HBV rates are greater in peoples with diabetes than in the public. (Younossi et al.,2017).

2.12.12. Travelers to Countries where HBV is Endemic

Those without HBV immunity who travel to an endemic country may contract the virus. Expatriates, visitors to friends and relatives, and travelers who engage in casual sex, dental surgery, or medical operations may be more susceptible to HBV infection. Younger travelers have a higher risk of contracting HBV, and individuals who travel for longer periods of time (Poovorawan et al., 2016).

2.13.Risk Of HBV Exposure at The Cardiac Intervention Laboratory in Cardiac Diseases and Surgery Centers

If sufficient safety precautions are not taken, the cardiac intervention laboratory can be a dangerous place. There is always the possibility of radiation, blood and other body fluids, and infectious diseases like hepatitis (see table 2-1). One of the blood-borne viruses that puts nursing staff and other healthcare workers at risk is HBV. The greatest risk

to cardiac intervention laboratory personnel is blood and equipment contaminated with blood, as well as bloody saline flash solutions (Sorajja et al., 2021).

Nurses and other healthcare personnel are frequently exposed to patients' bodily fluids and are involved in invasive operations. As a result, they may be exposed to bodily fluids such as blood at work on a daily basis. Percutaneous damage (e.g., needle stick injury or sharps injury) and blood splashes into the eyes, mouth, nose, or non-intact skin can cause exposure (Ahmad et al., 2021).

Table(2-1) cardiac intervention lab. potential blood exposure hazards (Sorajja P.,et al.,2021).

Procedure	Potential exposure
IV therapy	Needle stick , blood to skin contact
Local anesthesia administration	Needle stick
Arterial puncture	Needle stick , splashing of blood
Catheter insertion or exchange	Splashing of blood to skin , mucous membrane contact
Catheter flashing	Splashing of blood to skin , mucous membrane contact
Catheter removal and groin	Splashing of blood to skin , mucous compression membrane contact
Contact with soled linen or equipment	Needle stick , splashing of blood to skin , mucous membrane contact

2.14. Prevention of HBV Infection

2.14.1.Immunization Against HBV

Hepatitis B Virus vaccination is the cornerstone of HBV preventive strategy . In new born delivered to infected women and in some another post-exposure prophylactic scenarios, Hepatitis B Immune

Globulins (HBIG) are commonly used as an adjuvant to HBV vaccine. HBIG can help supplement protection until a vaccine response is achieved. After an HBV infection, HBIG delivered alone is the primary source of protection for people who do not respond to HBV vaccine (Schillie et al., 2018) .

2.14.1.1. Active Immunization: Vaccine

Enhance host's immunity is the aim of active immunization to HBV. Use of genetic engineering technology (or recombinant DNA), a very pure vaccine for HBV was developed in 1986. Blood isn't used in the production of this product because it's synthetic products(Das et al., 2019).

Currently ,the Pichia pastoris, Hansenula polymorpha, cells from Chinese hamster ovary , or yeast, are used to produce all recombinant vaccines that contain HBsAg (Leroux-Roels, 2015).

When compared to universal newborn vaccination, targeted immunization of adults engaged in high-risk activities may have slightly various satisfactory immune protection aims, especially when considering the age association with the danger of turns into a chronic HBV infection. The success of an HBV immunization program is determined by the reduction in chronic carriage and control of incident infection in a community(Osiowy et al.,2018).

Hepatitis B Virus vaccines must be saved at a temperature between (2° to 8°) Celsius (36 to 46°) Fahrenheit in the refrigerator and avoid freezing (Kroger , 2020). If Hepatitis B Virus vaccine is kept at 2-8°C when stored, it can remain stable for 3-4 years from the date of manufacture (Pattyn et al., 2021).

Hepatitis B vaccination is widely used around the world and safe. Allergy to yeast or any vaccine component is an absolute contraindication toward HBV immunization(Das et al.,2019).

Lactating women and pregnant can receive the HBV vaccine without danger. All occupationally exposed health-care employees and others should get vaccinated against HBV (WHO, 2019).Vaccination will have no effect on individuals who have Hepatitis B Virus infection already, and it is completely danger-free (no benefit or harm)(CDC, 2022) .

2.14.1.1.1.HBV Vaccination Schedule

There have been numerous clinical studies to determine the best appropriate vaccination dosage and immunization schedule to various categories, including infants , adults , new born, and patients with lowered immunity . The best vaccination would develop enough titer quickly, be long-lasting, and offer the same defense as naturally occurring anti-HBs (Das et al.,2019).

Anti-HBs antibodies usually show resistance to HBV infection . Immune-competent adults and children with vaccination should have (anti-HBs) levels of ≥10 mIU/Ml 1 to 2 months afterward receiving the entire HBV vaccine series are called vaccine responders. Anti-HBs levels decrease over time after vaccination, which is influenced by the age at which the vaccine was given.18 years following immunization, around 16% from people who were immunized at the age of <1 year have antibodies levels of ≥10 mIU/mL , compared to 74 percent of those who were immunized at the age of ≥ 1 year . Three intramuscular doses are usually given every 0-, 1-, and 6-months during primary vaccination schedule (Schillie et al., 2018).

Within 12 months, the anti-HBs titer drops dramatically, then slowly thereafter. Such a downward tendency can be predicted using advanced models and mathematical algorithms. The HBV vaccination is administered to healthy people at three intervals: baseline, one month, and six months. In people who appear to be healthy, a booster dose may not be necessary (Das et al., 2019).

2.14.1.1.2. Interruption of The Vaccination Schedule

When the HBV vaccination series is stopped , It is not necessary to repeat it to people of any age. If the series is stopped after the 1st dose, second dosage must be given at the earliest opportunity, with a minimum 8-weeks gap between the 2nd and 3rd doses. If only the 3rd dose is missing , it must be given at the earliest opportunity. The last dose of vaccination should be given at least 8-weeks following the 2nd dosage and at least 16-weeks following the 1st dosage, the time between the 1st and 2nd doses must be at least 4 weeks (Schillie et al., 2018).

2.14.1.1.3.Persons Recommended for HBV Vaccination

As a precaution, all newborns as part of the advised childhood vaccination regimen , should receive the series of HBV vaccines, starting at natal. Each not immunized children and teenagers aged less than 19 years should get HBV vaccine. People at danger of become infected due to sexual intercourse (sex partners who have HBV infection),travelers internationally to nations with intermediary or high levels of HBV infection (incidence of HBsAg of ≥ 2%), Anyone else seeking protection from infection with the HBV infection(Schillie et al., 2018).

Vaccination of those who are most at risk of contracting HBV is advised, people on dialysis, people who regularly need blood and its

products, solid organ transplant receivers, healthcare workers, diabetics, those with chronic liver illness, particularly those with HCV, people in prison, patients with HIV, injectable drug users, and their household people with chronic HBV infection (WHO, 2019).

2.14.1.2. Hepatitis B Immune Globulins (Passive Immunization)

Passive immunization by antibody injection can provide short-term protection against certain illnesses. The key advantage of employing this technique to avoid infection is that the protection is instantaneous (Domachowske , 2021).

In infants born to women infected with HBV and in some additional post-exposure prophylactic scenarios, HBV Immune Globulins (HBIG) are commonly used as an adjuvant to HBV vaccine. HBIG can help supplement protection until a vaccine response is achieved. HBIG is made using plasma of human that is known to have a great anti-HBs level. For post exposure prophylaxis, HBIG is usually combined with HBV vaccination. HBIG only is the main route to protection in the aftermath of HBV exposure for those who did not respond to the HBV vaccination (Schillie et al., 2018).

Hepatitis B Immune Globulins is injected intramuscularly; an adequate mass of the muscle (e.g., gluteus or deltoid) must be selected to inject the enough amount from HBIG. HBV vaccine and HBIG can be given at the same time, but at a different injection site (e.g., separate limb) (Schillie et al., 2013).

It is unknown how effective HBIG is when given after 7 days of exposure. Passive anti-HBs are provided by HBIG. When provided interim

protection (lasting 3–6 months). HBIG given within one week of exposure, it provides 75% protection against infection with HBV (Kashyap et al., 2019).

2.15. Protecting Nurses from Hepatitis B

Hepatitis B virus is extremely communicable and is spread largely by contact of mucosal or percutaneous with infected fluids of the body such as blood , elevating the danger of infection for nurses and other healthcare professionals who interface with patients and materials produced by patients on a regular basis (Stevenson et al., 2021).

In all healthcare settings, preventing transmission of contagious diseases amongst patients and HCWs is the vital element of safe delivery of healthcare. Occupational Health and Safety (OHS) provides occupational Infection prevention and control knowledge to an healthcare organizations (HCO) and services to HCW, including as immunizing HCW and monitoring HCW exposures that could be contagious and diseases to avoid the transfer of communicable diseases from potentially infectious patients to healthcare workers and anothers (Kuhar et al., 2019).

2.15.1.Pre-Exposure Management

2.15.1.1.Education and Training

Programs for training and education in infection prevention and control (IPC) aim to improve nurses' knowledge, competency, and practical skills in the prevention of infectious diseases. These programs are usually overseen by a facility's IPC program. Furthermore, training and education can confirm that nursing staff receives IPC procedures and policies and becomes accustomed to them, promote quick recognition, evaluation, reporting, and management of possibly contagious exposures, decrease

healthcare and nursing staff exposures to infection, and make it easier to control epidemics of communicable diseases (Kuhar et al., 2019).

The risk of contracting HBV varies throughout an nursing staff 's career, however it is often higher when the nursing staff initially enters a medical setting and begins professional training (Stevenson et al., 2021).

Nursing staff get education and training when they are hired, at regular intervals throughout their recruitment, for example by yearly update training, and when necessary to address certain requirements, for example new occupation responsibilities, novel medical technology or apparatus, or control of epidemic (Kuhar et al., 2019).To encourage early reportage of fluids of the body such as blood contacts , nursing staff should be well-trained regarding safe injection , and Post Exposure Prophylaxis (PEP) at the appropriate time (Nemr et al., 2018).

2.15.1.2. Nurses vaccination

According to the Occupational Safety and Health Adminstration (OSHA) standard requirements for blood-borne diseases that each employees with risk of exposure to any possibly infective substances, such as blood be receive the HBV vaccine for free to the employer, and that the vaccine be available for post-exposure management. Employers must tell employees about the vaccine's efficacy, safety, advantages of immunization, and administration mode, according to the guideline(Kuhar et al., 2019).

2.15.1.2.1. Pre & Post Vaccination Serologic Testing for Nurses

When services for laboratories are available and pre-vaccination examinations is thought to be economical the serological examinations

might lower the numeral of persons who receive unneeded vaccines if people already have HBV immunity(WHO, 2019).

Serological examinations must not be an obstacle to immunization of vulnerable people, particularly in hard-to-reach places examinations is not required to immunization, and when examinations is impossible , advised people should continue to be vaccinated (Schillie et al., 2018).

For post-vaccination testing, the following categories should be considered people at hazard of an HBV infection acquired at work, such as infants born to HBV infected women, people with chronic dialysis, health care providers, those with immune system impairment including those with HIV, and partners for sex or those who share needles with HBsAg-positive individuals (WHO, 2019).

Testing for anti- HBs must be conducted on all HCW who have recently received or completed HBV immunization. One to two months after the final dosage of the series of vaccines, anti- HBs testing must be performed , is administered if practicable. HCWs who run the risk of being exposed to bodily fluids or blood at work and have a whole ≥ three-dosage HBV vaccine series but no record of anti-HBs ≥10m IU/mL may be tested for anti-HBs when employment. Protective concentrations of anti-HBs (≥10 mIU/mL) should be detected using a quantitative approach such as ELISA- teste (enzyme- linked immunosorbent assay)(Schillie et al., 2013).

Incidence of HBsAg determined by serological studies, which will be descriptive of the intended people, will be the key instrument for assessing the impact of vaccination and confirming that the HBV control targets have been met. The success of immunization should be measured

and publicized for the sake of ensuring long-term support (Pattyn et al., 2021).

If the anti-HBs measurement of ≥10mIU/ml the healthcare worker considered protected, healthcare worker with anti-HBs levels of <10 mIU/mL must get another further vaccine doses (typically a total of six doses), then, one to two months after the last dosage, anti-HBs testing. (Schillie et al., 2013).

2.15.1.2 .2.Barriers to Vaccination of Nurses

Vaccination barriers differ by health care workers (including nursing staff) the workplace and the subcategory, Difficulty getting vaccinated (e.g., duration or place of service), lack of belief in the necessity of immunization (e.g., belief in a low vaccination effectiveness or low disease hazard), inadequate direction backing for immunization, and fright of adverse vaccination reactions example as dislikes of injections are all instances of barriers (Kuhar et al., 2019).

2.15.1.3. Standard Precautions for Infection Control

Standard precaution (SPs) are a group of infection prevention techniques, used to avoid the spread of infection through blood, fluids of the body , mucous tissues , and wounded skin. These precautions should be taken when caring for anyone, regardless of whether they are infectious \ symptomatic or not (see table 2-2)(Sadeghi et al., 2018).

Standard precautions are minimal prevention of the infection measures that offered to each patients , irrespective of whether they have a supposed or proven illness, in every situation where health care is provided. These health-care workers and patients are both protected by these procedures (Arinze - Onyia et al., 2018).

Table(2-2)Specific HBV infection control precautions (Ross & Furrows , 2014) .

Procedure	The use
Isolation	Not required.
Hand washing	Required.
Gloves	Required when blood/body fluid contact is possible.
Apron or gown	Required when blood/body fluid contact is possible.
Mask	Required when splashing of body fluids is possible.
Eye protection	Required when splashing of body fluids is possible.
Disinfection of blood/body fluid spillages	Chlorine-releasing agents at a concentration of 10 000 parts per million (ppm) available chlorine should be used to disinfect blood/body fluid spillages.
Waste management	Treat waste as 'clinical waste' and dispose of via clinical waste stream.
Linen and laundry	Items contaminated with blood/body fluids should be treated as 'infectious linen' and bagged accordingly.

Nurses and other (HCWs) should strictly adhere to infection-control policies based on universal precautions. They are greatly exposed to Hepatitis B and other blood-borne viruses if they do not follow the standards and SP regulating blood and other body fluids (Sadeghi et al., 2018).

Furthermore, the HCWs with insufficient experience or competence must be taught in basic safety principles such as hand washing ,Personal hygiene, proper disposal of contaminated trash , and sharps conventional measures or protective equipment when handling of potentially infectious blood and blood products, or other potentially infectious materials human bodily fluids (Kashyap et al., 2019) .

Hands need to be washed in the" five moments", Before touching the patient, following contact with bodily fluids such as blood, prior to using a sterile or clean procedure , and following contact with a patient. For most clinical care activities, hand washing by water and plain liquid soap is sufficient, the more significant than the kind of soap used is the technique of hand washing. It is also necessary to wash hands under running water rather than still water (Ross & Furrows , 2014).

Gloves serve two purposes, they protect HCWs and they inhibit microorganism transmission to patients during procedures. Gloves should be used when contact to fluids of the body and blood is expected. Gloves should be changed directly (after each patient and \ or upon achievement of the treatment or procedure, if a puncture is found). Gloves should be functional, well-fitting, and dependable (Khalid, 2019).

When doing procedures that are more exposed - hazardous, must be used two pairs of gloves (double gloving). Gloves used for a process or action must not be used to write on charts or handle or at all shared, clean surroundings. Gloves must never be washed or treated with alcohol hand rub. Wearing gloves does not eliminate the need to wash hands, hands should be cleansed both before and after donning gloves. Under gloves, no jewelry should be worn. Mini rings of metal are usually acceptable, however ring with stones can rip the material of the glove and must not be used with clinical practice (Ross & Furrows , 2014).

During operations and activities related to patient care that could result in spraying or splashing (fluids of the body, blood, secretions), fluid resistant gowns/coveralls and aprons protect infectious agents from contaminating clothing and skin. For treatments that are expected to result in splashes or sprays of blood or bodily substances, a clean, non-sterile

gown will suffice. A fluid-resistant long-sleeved gown, apron, or coverall is strongly recommended to reduce the risk of infectious blood and body substances, secretions, or excretions penetrating the underlying clothes or skin and unknowingly transmitting the infectious agent to the mucous tissues of the mouth, eye, or nose via the hands (PPHSN, 2021).

Aprons or gown should be worn when required, and not worn routinely as part of normal activities. They are for one-time use products that are abandoned and disposed of as clinical waste after one procedure or episode of patient care (CDHB, 2020).

After completing the task for which it was worn, the gown or apron must be taken off before touching clean and unpolluted places, goods, surfaces of the environmental, or interaction with other patients and employees (Ross & Furrows , 2014).

When materials, fluids of the body, or blood are probable splash into the (face, mouth, or eyes) eye protection, face masks, and visors must be used (CDHB, 2020).

Wearing the mask prevents splashes from getting into your mouth or nose. Masks that are torn or broken should not be worn since they may not provide adequate protection. Surgical masks are one- use products that must be discarded after usage ,and must be altered as soon as they get moist, wet, or contaminated (Ross & Furrows , 2014).

When using a mask, make sure (it's altered after it gets wet, not use again after disposal, It is not handled when you wear it, that it is not worn around the neck, wash hands after removing used mask. The mask's front is considered contaminated (PPHSN, 2021).

To guarantee that side parts are protected, visors/goggles must encircle the ocular region . Visors may be used in place of a goggles mask and combination when there is a significant risk of fluids of the body or blood spraying or splattering (Ross & Furrows , 2014).

To prevent the spread of microorganisms, every linen must be handled with care. While there is a possibility of contamination of the uniform/clothing, such as when making and changing beds, plastic disposable aprons must be used (CDHB, 2020).

Blood and body fluid contaminated linens and laundry should be treated as "infectious linens." Linens used for a patient diagnosed or supposed of having an infection , or that have been tainted with fluids of the body like blood must be located in special bags and labeled as from contaminated materials (Ross & Furrows , 2014).

Before linen is sent for laundering, HCWs must ensure that it doesn't contain any foreign objects, like sharp objects and tools, and that spent linen is located in leaky- resistant sacks (PPHSN, 2021).

Blood/body fluid spills must be disinfected. To disinfect fluids of the body such as blood spills, compounds that release chlorine at 10,000 ppm (parts per million) concentration accessible chlorine must be employed (Ross & Furrows , 2014).

When needles and other sharp objects or devices are used, the risk of HBV virus transmission is greatest. When cleaning reusable sharp instruments and disposing of sharps, more caution should be exercised to avoid accidents. Sharps are handled and disposed of safely by all HCWs who use them into (sharps containers) (PPHSN, 2021).

All sharp things must be brought for the patient in the trolley or tray. Provide the patient with a container for sharps (for the care point). After use of sharps, immediately dispose of them in a sharps container. Never separate the syringes and needles, dispose of them together. Re-sheathing needles is not recommended, if it is necessary, set the cap on a horizontal surface and drive the needle in it, or use a re-sheathing tool. Waste disposal Trash should be disposed of through the clinical waste stream and processed (Ross & Furrows , 2014).

Sharps should not be handed between health care workers by hand, instead, they should be transferred using a puncture-resistant tray or kidney dish. After using needles, lancets, or other sharps, do not bend them. Sharps should never be put into a sharps container by force(PPHSN, 2021).

2.15.2. Post Exposure Prophylaxis (PEP)

Nursing staff and other HCWs at a significant hazard of contracting HBV infection as a result to their exposure to infected body fluids such as blood. These infections are dangerous, but they can be avoided, especially in health-care settings, by using post-exposure prophylaxis appropriately and promptly (Sharma & Adhikari , 2019).

2.15.2.1. Initial Post exposure Management

All professional injuries should be treated with quickly irrigation and cleansing with soap and water. Although the use of antiseptics is not contraindicated, there is insufficient data to show that chlorhexidine or iodine solutions for lower the risk of transmission blood- transmitted infection to wound (O'Brien & Lim, 2019).For the greatest possible outcome, post-exposure prophylaxis should be started through an 60 minutes after the exposure (Ross & Furrows , 2014).

If blood or other bodily fluids enter the mouth, it is spit and the mouth rinsed with water several times. Any contaminated clothing is removed and bathed. If the eyes are exposed or have been contaminated, rinse them gently with normal saline or water for at least 30 seconds while they remain open (remove contact lenses) (PPHSN, 2021).

Injuries and skin areas that have come into contact with fluids of the body such as blood must be cleaned with water and soap, and mucous tissues should be flushed by water(Schillie et al., 2018).

All HCWs, even those who have established HBV protection, must be advised to report any exposures to fluids of the body or blood as soon as possible . occupational health with the purpose of determining the best course of action to prevent the spread of blood-borne pathogens (such as HIV, HCV, and HBV)(Schillie et al., 2013).

The HCW should notify their supervisor or manager as soon as possible (24 hours). The supervisor shall arrange for prompt medical evaluation to the patient who is the source of exposure as well as to the HCW, and fill out the report of an exposure. The staff member's name to whom the exposure occurred, where the incident occurred such as the operating theater or other location, an explanation of the occurrence, The name of the person who shared blood or other body fluids and who may have been involved in the accident should be included in the exposure report . If the blood's source is uncertain, it must be noted as well (PPHSN, 2021) .

When the identity of the source patient is unclear (like a needle in to the garbage), the injured HCW must be treated as if the source person was positive for HBV. Whether the source person is unknown or known, sharp tools testing and needle concerned in an injury is not suggested,

because in such conditions, the reliability and interpretation of data are indefinite, and testing can pose a threat to those handling sharp tools (Schillie et al., 2013).

If the source patient's infectivity status cannot be determined, the person who has been exposed must be handled as though the source were infected. If available, review previous HIV, HBsAg, and HCV testing results. If known, check the dates of HBV vaccinations and the post-immunization (anti - HBs) titer . If the injured person has been immunized but is uncertain response, a test for (anti - HBs) must be sought (Chilaka et al., 2020).

Nurses and other HCWs should quick access to post-exposure care, including HBV vaccination and HBIG, from their institutions. HBV vaccine and HBIG must be given immediately if possible following an injury to HCWs who are regarded to be susceptible to HBV infection. After the (anti-HBs) produced by HBIG are gone (after 6 months of given), anti-HBs examination of HCW who received HBIG should be undertaken. When HBIG is given more than seven days after exposure occurred to an injured person (after of exposure of the non-intact skin, percutaneous, exposure of the mucosal) the resulting benefit is unknown (Schillie et al., 2013).

If the health care provider does not have a response to the vaccine after completing the series of vaccinations and has been exposed to infection from an unknown source or HBsAg is positive, must be given two HBIG doses. Inside 24 hours after exposure, initial dosage must be administered; If it's not practicable for example(delayed results), It should be administered as soon as possible, ideally inside 7 days, the next dose should be given one month after the initial dose (Chilaka et al., 2020).

2.15.2.2. Post Exposure Prophylaxis (PEP) for Vaccinated Nurses and other HCWs

Testing the source patient for HBsAg is not essential for immunized HCW (whose whole course of HBV immunizations has been documented in writing) with following verified anti-HBs ≥10 mIU\mL, regardless of the HBsAg level for the source patient, no HBV post-exposure prophylaxis is required. If the HCW's anti-HBs levels are less than 10 m IU/ ml and the source patient is HBV infected or with an uncertain HBsAg condition, the HCW must get one dosage of HBIG and be re- vaccination immediately feasible following exposure (see table 2-3) (Schillie et al., 2018).

If the HCW's anti-HBs level is less than 10 mIU/mL and the source person tests negative for HBsAg , the HCW must get another HBV vaccination dosage, (one to two) months later, anti-HBs testing is conducted. Regardless of the source patient's HBsAg status, if the HCW possesses anti-HBs ≥10 mIU/mL when the exposure occurred, post-exposure HBV care is not required (Schillie et al., 2013).

The source person must be confirmed for HBsAg condition immediately feasible following the exposure of immunized HCW (who possess written proof of HBV immunization) with anti-HBs less than 10 mIU/mL following two whole HBV series of vaccines. The HCW must receive two doses of HBIG if the source person is infected with HBV or with uncertain HBsAg condition , the first dose must be given immediately feasible following exposure, with the naxt dose being given after one month (Schillie et al., 2018).

The HBV vaccine is not advised for HCWs who have already received two HBV vaccine series. Neither HBIG nor HBV vaccination are

required if the donor person negative for HBsAg . No matter the HBsAg condition of the source person , if the HCW possesses anti - HBs ≥ 10 mIU/mL when the exposure occurred , post-exposure HBV care is not required (Schillie et al.,2013) .

Table (2-3) PEP of HCW following mucosal or percutaneous exposure to fluids of the body or blood, by HCW immunization against HBV and response status (Schillie et al., 2018).

	Post exposure testing		Post exposure prophylaxis		
HCW status	Source patient (HBsAg)	HCW testing (anti-HBs)	HBIG	Vaccination	Post vaccination serologic testing
Documented responder after complete series	No action needed				
Documented non responder after two complete series	Positive/unknown	-*	HBIG x2 separated by 1 month	-	N/A
	Negative	No action needed			
Response unknown after complete series	Positive/unknown	<10 mIU/mL	HBIG x1	Initiate revaccination	Yes
	Negative	<10 mIU/mL	None	Initiate revaccination	Yes
	Any result	≥10 mIU/mL	No action needed		
Unvaccinated/incompletely vaccinated or vaccine refusers	Positive/unknown	-	HBIG x1	Complete vaccination	Yes
	Negative	-	-	Complete vaccination	Yes

Abbreviations: anti HBs = antibody to hepatitis B surface antigen; HBIG = hepatitis B immune globulin; HBsAg = hepatitis B surface antigen; HCW = Health Care Workers ; N/A = not applicable. ,* Not indicated.

2.15.2.3. Managing Nurses Who Lack Documentation of Vaccination, are Not fully Immunized or Unimmunized

The source person must be evaluated to HBsAg immediately feasible following the exposure for not fully immunized or unimmunized HCW (including those who declined immunization). Anti-HBs testing for unvaccinated or partially vaccinated HCWs is unnecessary and possibly deceptive , because only individuals who have finished series of the vaccination have anti-HBs levels ≥10mIU/mL as evidence of immunization protection (Schillie et al., 2018)

Due to anti - HBs testing of HCW that got HBIG must be done following anti-HBs from HBIG is not discernible (after 6 months of administration), Anti-HB testing must be delayed for more than 1-2 months following the last dose of vaccine. HCWs who are anti-HBs levels less than(10mIU\ml) should be revaccinated follow receiving the initial series. Testing for anti-HBs (1- 2) months follow the 3rd dosage, followed by the second series with complete three -dosage on an appropriate timetable, is usually more realistic for these HCW than serologic testing after each successive vaccine dose. The HCW must complete the HBV vaccine series as instructed even if the source person's HBsAg test results are negative(Schillie et al., 2013).

2.15.2.4. Testing of Nurses and other HCWs Exposed to Unknown or Positive Source of HBV

Nurses and other HCWs with anti-HBs less than10 mIU/mL, or who are not fully immunized or unimmunized, who have occupational exposure by a person with positive HBV or with unknown HBsAg condition must have starting point teste for HBV infection immediately if

possible following the exposure, then a subsequent test about six months afterwards (Schillie et al., 2018).

Total anti-HBc should be tested immediately after exposure, and total anti-HBc and HBsAg must be tested 6 months later. During the follow-up period, HCW exposed to a person with positive HBV or with unknown HBsAg condition do not require for take any additional care to avoid secondary spread, nonetheless, they should avoid giving blood, plasma, organs, tissue, or sperm (Schillie et al., 2013).

2.16. Nurses' Knowledge and Attitudes toward HBV

Because nursing staff and other HCWs are at hazard of infection transmission from infected or contaminated needles and syringes, as well as from exposure to fluids of the body and blood through the medical or surgical practice, it is critical that they follow proper infection control and prevention measures. Nurses are the most common health-care workers who are exposed to needle prick injuries and infectious fluid contact (Potdar et al., 2019).

Lack of knowledge about the place of work safety precautions like HBV immunization, occurrence of HBV and post-exposure management, the implementation of safer working techniques, and training might facilitate the spread of HBV(Mursy et al., 2019).

As a result, it is critical for nurses and nursing students to have a good understanding of HBV in order to decrease the infection extended among themselves and other health care workers. The knowledge and attitudes of health-care employees are critical in preventing illness spread (Potdar et al., 2019) .

Knowledge is the comprehension of any particular topic. While attitude includes any preconceptions, opinions, the tendency to act in a certain way in a given circumstance , and motives for choosing a particular course of action (Mursy et al., 2019).

Nurses and other HCWs with sufficient knowledge and training in HBV infection play a significant role in executing HBV infection control strategies. HCWs' lack of knowledge and negative attitudes have been identified as barriers to providing health education and controlling HBV infection (Roien et al., 2021).

Knowing the facts and being informed can help HCWs change their attitudes and reduce the disease's threat. The low level of immunization and high prevalence of HBV surface antigen (HBsAg) reported in several studies could be explained by HCWs' lack of understanding of the transmission mechanism. Prevention is still the best defense against a viral hepatitis epidemic (Akazong et al., 2020).

2.17. Previous Study

First Study:

A study was conducted by Hilal & Redha (2021)to identify the effectiveness of the instruction program on the knowledge of the nurses in the operating theater about HBV, The study was conducted in Wasit Governorate, Iraq. The study used a quasi-experimental design. Data was collected at two points: pre and post-test, as well as program interventions for the study group . The sample was purposeful comprises 60 of nurses working in the operational rooms of two teaching hospital. The study found that the program is very effective in improving nurses' knowledge of HBV transmission and prevention in the study group indicated by high

significant difference in times of pre and post-test at p-value=0.001. While there was no significant difference in the control group. The research shows the value of the instruction program for nurses in group of study and the statistical differences between educational attainment and years of experience with knowledge .

Second Study:

A study by Abdulla & Abdulla (2014) a study was conducted on determining of an educational program effect on the practice and knowledge of nurses in emergency of hospitals about HBV, at Erbil Governorate .A quasi-experimental design ,used test and retest method . A questionnaire created by the researcher , to increase the nurses' knowledge and practices about the HBV, The same questionnaire was used for pre and post-test , 50 nurses contributed in sample. The results show The mean (±SD) score of pre-test knowledge was 6.96±1.6, while the mean (±SD) score of post-test knowledge was 8.4±1.5 ($P<0.001$). The study concluded that there are statistically significant differences in the mean score in the pre and post program tests with regard to on some factors of knowledge and practices. The program of education had a substantial impact on some factors that could improve HBV preventive knowledge and practices.

Third Study:

Mustafa & Taha (2016) conducted research about identify the effect of an educational program on knowledge of the nurse in Nineveh 's hospitals around HBV. The study used a quasi-experimental design . The study sample was chosen 60 nurses randomly and separated to two groups (control and study)each one contain 30 nurse. Findings of the study revealed that an educational program has a positive effect on nurses' knowledge of HBV for the study group , by comparing the pre and post-

test of the study and the control group. There was a dearth of understanding among nurses concerning HBV before the educational program was implemented, but there was an improvement afterward.

Fourth Study:

A study was conducted by Mahrous & Gendy (2016) to determine the effect of global interventional program on practice and knowledge of nurse regarding HBV. The design was quasi-experimental. The sample contain 50 nurses chosen was randomly allocated. The findings of the study revealed a statistically significant link between knowledge, practice, and educational attainment. The study concluded After implementation, a HBV educational program increased understanding and practice while lowering occupational risk of blood-borne infection.

Fifth Study:

Potdar, Ashutosh, & Vivek (2019) have studied about the nursing staff's practice, knowledge, and attitude toward HBV infection , the study took place in southern India. Design of the study was cross sectional (descriptive) study, with purposive sample, by select 145 nursing staff members from various departments who were approached in person at the time of the study. The survey found that 64.7% of the participants knew enough about HBV. Around16% were unaware of the route of transmission, 23 % were unaware that it is communicated by unsterilized tools, 46 % were unaware of the vaccine schedule, and 20% were unaware that it is avoidable. HBV was viewed positively by 86.5% of those polled. 22.4% of the total 145 nurses did not follow the recommended HBV prevention strategies. At the time of our study, 35%of the 145 nurses had not had their HBV vaccination. The study concluded one-third of nursing staff members are unaware of the HBV. Around 16% of nurses are unaware

of how HBV is transmitted. At the time of investigation, one-third of the nurses were not HBV-vaccinated. To keep nursing personnel from contracting this dangerous virus, regular health education programs should be implemented to promote understanding and preventive Practice.

Sixth Study:

Mursy, Mahmoud, and Sagad (2019) have studied about the midwives and nurse's practice, knowledge, and attitude toward HBV infection the study took place in Sudan. Design of the study was cross sectional(descriptive) study, with purposive sample contain (110) midwives and nurses to investigate practice, knowledge, and attitude toward HBV infection , the previously verified regulated instrument of the research was created and administered. The result of the study was, 58.2% of respondents have medium level knowledge, and the number of those who have a safe practice is two thirds of the number, and positive attitude towards preventive measures about HBV. Almost half of the respondents 51.8% have previous injuries from needle stick. Also, inaccurate perceptions about post-exposure management were among half of the respondents, while more than half of midwives and nurses did not complete the immunization schedule against HBV. The study concluded, most midwives and nurses were aware of hepatitis B virus infection. However, a large proportion of them did not have sufficient information about post-exposure precautions, They also have a low rate of completing immunizations against HBV and a high rate of injury by needle sticks.

Chapter Three
The Methodology

The Methodology

3.1. Design of The Study

The design of the study was quasi– experimental used a teste and retest method for two groups of samples (study and control), the sample consists of a group of Nurses working in the Kerbala Center for Cardiac Diseases and Surgery, located in the holy governorate of Kerbala. The duration of conducting the study was from 1st November 2021 to 16th June 2022 .

3.2. Administrative Arrangements

Before actually starting the data collection, the official approval was obtained from the concerned departments to conduct the study as follows: Holy Kerbala Health Directorate \ Training and Human Development Department \ Kerbala Center for Cardiac Diseases and Surgery [Appendix -A].

3.3. Ethical Consideration

In order to participate in the study, participants were fully informed of the current study and its objectives and then voluntary consent was received. In addition, the confidentiality of the acquired information was taken into account by the nurses. Ethical approval was also obtained from the Ethical Research Committee of the College of Nursing, University of Kerbala regarding the confidentiality and anonymity of the participants. [Appendix- B].

3.4. Setting of the Study

The study is conducted in the Kerbala Center for Cardiac Diseases and Surgery. It is a specialized center affiliated to the Holy

Karbala Health Directorate. It deals with patients suffering from heart diseases. It is provides the surgical and medical services daily for 24 hours. It receives patients with emergency and cold cases to provide the necessary therapeutic interventions, whether surgical or medical treatments.

3.5. Sample of the Study

A non – probability (convenient sample) chosen from Nurses working in the Kerbala Center for Cardiac Diseases and Surgery, located in the holy governorate of Kerbala. The study's initial participant pool was (60) nurses, but a some of them dropped out, the final a sample consisted from (50) nurses. The study sample was divided into two groups (control and study), and each group consisted of (25) participants. The study group was exposed to the educational program, while the control group remained without interference. The selection criteria were established as follows:

3.5.1. Inclusion Criteria

- All nurses of all educational levels who work in the Kerbala Center for Cardiac Diseases and Surgery.

3.5.2. Exclusion Criteria

- Participants in the pilot study.
- Other health care workers in the Kerbala Center for Cardiac Diseases and Surgery who are not nurses.

3.6. Steps of the Study

In the current study , the subsequent steps were followed :

3.6.1. Preliminary Assessment for Nurses' Knowledge and attitudes Concerning Prevention of Hepatitis B Virus Infection:

A preliminary assessment is an initial study aimed at exploring nurses knowledge and attitudes needs about prevention of viral hepatitis B infection in the kerbala center for cardiac diseases and surgery. The preliminary study conducted in 1st to 2nd of January 2022 on 20 participants.

The assessment questionnaire of knowledge and attitudes is composed of 20 close ended questions through the previous Studies, review of available literature, researcher's background and review with a nurses in order to determine their needs for program, every participant had 20-30 minutes to respond to the questions.

According to the assessment's findings, the participants have lacking or poor in knowledge toward prevention of HBV infection. and many Inappropriate attitudes. So, the assessment showed to that developing educational program to those participants to improve their attitudes and advance their knowledge about prevention of viral hepatitis B infection is crucial. The assessment's findings are presented in [Appendix- C].

3.6.2.Construction of Educational Program

Designing the educational program was based on the information obtained from the review of previous scientific studies and literature related to the subject of the study, on the findings of the needs assessment for participants, in addition to experiences of researcher, and based on nurses' needs for further information regarding prevention of HBV infection [Appendix - D, the educational program].

3.6.3.Parts of The Questionnaire

To fulfill the study's purpose, the questionnaire form was constructed and designed after reading previous studies and literature. There are 3 parts to the questionnaire [Appendix- E].

Part 1 :- Includes demographic information of nurses involve age, gender, marital condition, educational level, experience period, previous training courses on HBV prevention, being injured by a sharp object or a needle while working, HBV vaccination, and the number of doses taken.

Part 2:- Nurses' knowledge toward Hepatitis B virus and its prevention: There are 3 sections in this part , including 30 items:

Section I : The knowledge of the nurses about viral hepatitis B and its signs & symptoms (7 items)

Section II: The knowledge of the nurses about (transmission, diagnosis, treatment) of hepatitis B infection (8 items).

Section III: The knowledge of the nurses towards prevention of hepatitis B infection (15 items).

Part 3 :- The attitudes of the nurses about hepatitis B infection and its prevention including 10 items .

3.7. Testing Questionnaire for Validity and Reliability

3.7.1. Study Instrument Validity

The instrument of the study [Appendix- E] has undergone a set of modifications, which were based on the opinions and viewpoints of a panel of experts (face validity method) [Appendix-F], The experience of

the members of the panel of experts are not less than four years in their field of specialization.

Each expert reviewed the study questionnaire in terms of content, style, suitability, simplicity and relevance, according to what was proposed by the researcher to each expert member.

The panel consists of 16 experts from different specializations to make the research instrument more valid [Appendix-E] The distribution of experts was as follows: (2) from College of Nursing (faculty member)\ Baghdad's University,(4) from College of Nursing (faculty member)\ Kerbala's University,(2) from College of Nursing (faculty member)\ Babylon's University,(1) from College of Nursing (faculty member)\ Al-Qadisiyah's University,(3) from College of Medicine (faculty member)\ Kerbala's University,(2) from College of Nursing(faculty member) \ Kufa's University,(1) from College of Nursing (faculty member) \ Al- Ameed's University, (1) A physician specializing in gastroenterology and hepatology from Kerbala Center for Gastrointestinal and Liver Diseases.

The outcomes of the experts' review of the questionnaire showed that they all concur, since it was suitable for the study's measurement and clear. Items underwent changes, rewriting their text. These changes were made in accordance with the advice of the experts.

3.7.2. Pilot Study

Convenience sample of (20) participants chosen among nurses work in the Kerbala Center for Cardiac Diseases and Surgery, this Pilot study was conducted for the period of (16th February 2022 to 28th February 2022).

3.7.3. Objectives of Pilot Study:

1-To check the instrument structure's content sufficiency and clarity throughout the subject's understanding, as well as to decide the necessary revisions.

2- To determine the internal consistency of the study questionnaire.

3-To estimate the average amount of time each nurses member will need to collect data during the interviewing procedure.

4-To identify the optimal approach, and determine the nature of the obstacles they may confront.

3.7.4. Reliability of the Questionnaire Format Items:

In order to determine the questionnaire's accuracy, reliability was considered , as the outcomes demonstrated a high level of internal stability and consistency of fundamental components with regard to questionnaire item replies , the main statistical parameter (Alpha Cronbach) , that was used to determine reliability , see table no. (3-1) .

Table (3-1): Alpha Cronbach results (reliability coefficients) to determine the internal consistency of the study questionnaire

Items	Reliability Coefficients of the Studied Questionnaire	Standard Lower Bound	Actual values	Assessment
knowledge	(Alpha Cronbach – α)	0.70	0.78	Accepted
Attitude	(Alpha Cronbach – α)	0.70	0.80	Accepted

By calculating the result, the questionnaire was found to be meaningful and successful , Also, a specially designed questionnaire was valid for studying a phenomenon of (effectiveness of an educational program on nurses' knowledge and attitudes toward prevention of viral hepatitis type b infection at kerbala center for cardiac diseases and surgery) assuming that conditions on the studied population remain stable, on the same population whenever in the future, and that are accounted on measuring improvements due to applying the suggested of education program.

3.8. Collection of Data

A self-administration technique was used during the procedure for collecting data , and the nurses completed the questionnaire forms on their own . Data were collected by the following techniques:

• Pre-test data collection (study group) (25) and (control group)(25) nurses from Kerbala Center for Cardiac Diseases and Surgery.

•The study group (25) nurses are exposed to the educational program by five lectures in 5 days at March 13th 2022, the time for each lecture (60minute) at (9:30 a.m. to 10:30 a.m.) in the Cardiac Diseases and Surgery Center , the teaching methods were: Lectures with laptop with display screen, whiteboard, and discussion.

• The post-test- data collection process, for participant's (study group) nurses and (control group) nurses, is done in March 17th 2022 .

3.9. Rating and Scoring

The items of questionnaire have received ratings and scores according to the following patterns:

1. The nurses' knowledge respondent for each question was scored with (1) for correct, and (0) for incorrect. (MS= mean of score , RS= relative

sufficiency) has been approved to define the degree of knowledge . The. cutoff point of nurses' knowledge respondents was (0.5). The higher the mean score (MS) level of the questionnaire items, the greater the knowledge toward the prevention of viral hepatitis B infection. The mean score for acceptance of a nurse's knowledge score was as follow: Low levels of knowledge = (mean of score=less than 0.5), High levels of knowledge = (mean of score=0.5-1.0).

2. The nurses' attitudes respondent to each question was scored with a five-point Likert scale, the possible responses for each item were determined like this : (1) for strongly agree, (2) for agree, (3) for not sure, (4) for disagree, and (5) for strongly disagree. The high-grade score levels of nurses' attitudes toward the prevention of viral hepatitis B infection indicate positive attitudes.

3. The higher percentage of the knowledge development, the greater effectiveness on nurses' knowledge results from the application of the educational program. It was shown as(low, moderate, and high). According to the following formula, the relative sufficiency (RS) to acceptance knowledge of nurses score was defund: RS=Mean of score/number of score 100. The level of improvement was calculated based on the relative sufficiency that is determined using the formula : RS= Cutoff point x 100 \ No . of scale .

3.10. Statistical Data Analysis

IBM \ SPSS version 25 was used to analyze the data . The study's findings were assessed and analyzed using both inferential and descriptive statistical analysis techniques , that are as follows:

3.10.1.Discriptive Analysis of Data

Frequencies (F), percentages(%), cumulative percent, M.S., R.S., and standard deviation (SD) that used to summarize the data in order to

make a comparison between the study variables.

- The percentage (%) that is determined using the formula :

$$\% = \frac{\text{Frequencies}}{\text{Size of sample}} \times 100$$

- The MS was calculated using the following formula:

$$\text{mean of score , MS} = \frac{\sum s_i * f_i}{\sum f_i}$$

Where S_i = score ,(i) = index , f_i = frequency of (i) responding .

- The RS was calculated according to the following formula:

$$\mathbf{RS} = \frac{\mathbf{MS}}{\mathbf{No.\ of\ score\ levels}} \times \mathbf{100}$$

- A bar-chart presentation for graphics.

1. **Analyzing inferential data:** the statistical hypothesis were rejected or accepted by using this analysis, included with the following :

a. Pearson correlation coefficient : used to determine the relationship between 2 variables and to determine the direction as well as the strength of this relationship. It was calculated according to the following formula:

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}}$$

Where xi = values of the x –variable in sample ,yi= values of y-variable ,and r = coefficient of correlation .

b. Paired sample t-test: used for measure the differences in the mean score of respondents between (pre and post) tests period of the program for the (control and study) groups. the following formula was used to calculate it :

$$t = \frac{\sum d}{\sqrt{\frac{n(\sum d^2)-(\sum d)^2}{n-1}}}$$

Where, Σd is the sum of the differences, d difference between paired value, n number of samples.

c.Analysis of Variance (ANOVA):

In this study, one-way ANOVA tests are used to identify the association between the effectiveness of the educational program and some selected variable.

Table (3-2) : ANOVA (Variance Analysis) :

Source of variance	Sum of square	d.f	Mean square	F
Between Groups	$SS_{B=} \sum \frac{(\sum Xp1)2}{n} - \frac{(\sum Xp)2}{n}$	$Df_b=K-1$	$\frac{SS\beta}{DF\beta}$	$\frac{MSB}{MSW}$
Within Groups	$SS_{W=}(\sum Xp)2 - \frac{(\sum Xp)2}{n}$	$Df_W=N-K$	$\frac{SS\varpi}{Df\varpi}$	
Total	$SS_{T=}(\sum Xp)2 - \frac{(\sum Xp)2}{n}$	$Df_T=N-1$		

Where Dfb (degrees of freedom for the between-groups variance); dfw (degrees of freedom for the within-groups variance); F = Anova Coefficient; MSB = Mean sum of squares between the groups; MSW = Mean sum of squares within the groups; SST = total Sum of squares; p = Total number of populations; n = The total number of samples in a population; SSW = Sum of squares within the groups; SSB = Sum of squares between the groups; s = Standard deviation of the samples; N = Total number of observations. (Plichta and Kelvin, 2013).

Chapter Four
Results of the Study

Results of the Study

This chapter addresses the results of study that are systematically organized and presented according to participant responses during the pretest post-test periods of the program.

Table (4-1):Distribution of the control and study groups participants based on their demographic data (n = 50) :

Demographic characteristics		Study group		Control group	
Variables	**Categories**	**F .**	**%**	**F.**	**%**
Age Groups / Years	20-30	21	84.0	17	68.0
	31-40	2	8.0	5	20.0
	41-50	2	8.0	3	12.0
	Total	25	100.0	25	100.0
Gender	Male	8	32.0	17	68.0
	Female	17	68.0	8	32.0
	Total	25	100.0	25	100.0
Marital Status	Married	17	68.0	15	60.0
	Unmarried	8	32.0	10	40.0
	Total	25	100.0	25	100.0
Education levels	Nursing secondary school	7	28.0	5	20.0
	Diploma	13	52.0	16	64.0
	College of nursing	5	20.0	4	16.0
	Total	25	100.0	25	100.0
Years of experiences	1-5	20	80.0	13	52.0
	6-10	2	8.0	5	20.0
	11-15	1	4.0	1	4.0
	16-20	2	8.0	4	16.0
	21-25	0	0.0	2	8.0
	Total	25	100.0	25	100.0
Participating in training course	No	22	88.0	24	96.0
	Yes	3	12.0	1	4.0
	Total	25	100.0	25	100.0
Vaccination status	Unvaccinated	8	32.0	8	32.0
	One dose	3	12.0	9	36.0
	Two doses	2	8.0	2	8.0
	Three doses	12	48.0	6	24.0
	Total	25	100.0	25	100.0
Needle stick injury	No needle stick injury	10	40.0	10	40.0
	Needle stick injury	15	60.0	15	60.0
	Total	25	100.0	25	100.0

F = Frequency ; % = Percentage.

Table (4-1) reveals that 84.0% and 68.0% from the participants enrolled in the control and study groups respectively are at the age group of 20-30 years old, and 68.0% from the participants in the control and study groups are females and males respectively. Concerning educational level, more than half (52.0%) of the study group and approximately two-thirds (64.0%) of the control group have a diploma. Regarding the years of experience, the result in this table indicate that the majority (80.0%) from the study group , and more than half (52.0%) of the control group had 1-5 years. With respect to participating in training about the prevention of viral hepatitis B infection, the majority (88.0%), and (96.0%) of the control and study groups respectively do not participate in a training course about the prevention of hepatitis B infection. Regarding the history of exposure to needle-stick injury, 60.0% of the study and control group have been exposed previously to needle-stick injury.

Table (4-2-1):Nurses' knowledge toward the prevention of HBV infection(pre and post-test period) for the control group:

Nurses' knowledge items		Pre - test			Post – test		
		M.S	S.D.	Level	M.S	S.D.	Level
1.	**Hepatitis B virus infection is caused by a virus that contains in its genetic composition:**	**0.20**	**0.40**	**L**	**0.24**	**0.43**	**L**
2.	**The viral family to which the hepatitis B virus belongs is called:**	**0.24**	**0.43**	**L**	**0.32**	**0.47**	**L**
3.	**Which of these age groups, if their members are infected with hepatitis B virus, most of them do not show symptoms in general?**	**0.36**	**0.49**	L	**0.44**	**0.50**	**L**
4.	**HBV infection is more severe in one of the following age groups:**	**0.40**	**0.50**	L	**0.48**	**0.51**	**L**
5.	**The incubation period for hepatitis B virus after infection ranges as follows:**	**0.20**	**0.40**	L	**0.28**	**0.45**	**L**
6.	**The chance of hepatitis B becoming infected increases from the acute to the chronic phase depending on :**	**0.28**	**0.45**	L	**0.28**	**0.45**	**L**
7.	**Which of the following signs & symptoms are not signs & symptoms of hepatitis B in the acute phase?**	**0.32**	**0.47**	L	**0.44**	**0.50**	**L**

8.	**Which of the following people is not considered to be at high risk of HBV infection?**	**0.36**	**0.49**	L	**0.44**	**0.50**	**L**
9.	**The probability of infection with hepatitis B virus after exposure to contaminated needle sticks is:**	**0.44**	**0.50**	L	**0.48**	**0.51**	**L**
10.	**Which of the following bodily fluids is not considered probable infection unless it contains blood?**	**0.28**	**0.45**	L	**0.32**	**0.47**	**L**
11.	**The hepatitis B virus remains active and contagious on surfaces for:**	**0.24**	**0.43**	L	**0.28**	**0.45**	**L**
12.	**Laboratory diagnosis, when examining the blood for HBV infection, focuses on detecting one of these antigens:**	**0.32**	**0.47**	L	**0.32**	**0.47**	**L**
13.	**The result of a blood test to detect hepatitis B virus is positive after a period of:**	**0.24**	**0.43**	L	**0.28**	**0.45**	**L**
14.	**All patients whose infection does not turn into the chronic phase will have a negative HBV blood test after:**	**0.28**	**0.45**	L	**0.40**	**0.50**	**L**
15.	**Which of the following measures not used to treat and care for hepatitis B patients in the acute phase?**	**0.28**	**0.45**	L	**0.28**	**0.45**	**L**
16.	**Which of the following points are more important than others in hands washing?**	**0.36**	**0.49**	L	**0.44**	**0.50**	**L**
17.	**Wearing the gown when dealing with a person with HBV is required in one of the following cases:**	**0.16**	**0.37**	L	**0.24**	**0.43**	**L**
18.	**When the eyes are exposed to blood or body fluids, they can be washed with one of the following materials:**	**0.32**	**0.47**	L	**0.48**	**0.51**	**L**
19.	**Two pairs of gloves (double gloves) should be worn when handling a HBV patient in one of the following :**	**0.36**	**0.49**	L	**0.40**	**0.50**	**L**
20.	**It is preferable to use one of the following sterile materials when dealing with blood and fluids contaminated with HBV spilled on surfaces for sterilization:**	**0.24**	**0.43**	L	**0.44**	**0.50**	**L**
21.	**When exposed to a puncture with a used needle, it is recommended to deal with that needle by doing one of the following:**	**0.16**	**0.37**	L	**0.16**	**0.37**	**L**
22.	**Immunoglobulin should be taken as soon as possible after exposure when required (preferably within 24 hours) where its effect is not known after:**	**0.20**	**0.40**	L	**0.32**	**0.47**	**L**
23.	**Immunoglobulin gives the body temporary immunity against HBV for a period that lasts:**	**0.24**	**0.43**	L	**0.32**	**0.47**	**L**
24.	**Exposure to contaminated needles and sharp instruments should be reported if the healthcare provider:**	**0.36**	**0.49**	L	**0.40**	**0.50**	**L**

25.	**Which of the following groups cannot be given the HBV vaccine?**	**0.28**	**0.45**	L	**0.36**	**0.49**	**L**
26.	**To manufacture the hepatitis B virus vaccine, one of the following methods is used:**	**0.08**	**0.27**	L	**0.20**	**0.40**	**L**
27.	**HBV vaccine can be given together with immunoglobulin if the condition of the exposed person requires, as follows:**	**0.20**	**0.40**	L	**0.36**	**0.49**	**L**
28.	**A person is considered immune to HBV if he has a level of (anti-HBs) after completing the vaccine doses as at least as follows:**	**0.08**	**0.27**	L	**0.20**	**0.40**	**L**
29.	**When taking the HBV vaccine, we get additional protection from one of the following types of viral hepatitis:**	**0.20**	**0.40**	L	**0.16**	**0.37**	**L**
30.	**In some cases, the person's condition after exposure to infection requires giving more than one dose of immunoglobulin, and it is given as :**	**0.32**	**0.47**	L	**0.44**	**0.50**	**L**
Total Knowledge Items		**0.26**	**0.14**	L	**0.28**	**0.14**	**L**

S.D = Standard Deviation ; M.S = Mean of score ; L= Low level of knowledge (M.S. < 0.5) .

The result in table (4-2-1)shows that there are no significant present in the mean score and relative sufficiency of the knowledge respondents toward the prevention of viral hepatitis B infection in the (pre and post-test) period of the education program among nurses enrolled in the control group. There is a low level of knowledge in all items in the (pre and post-test) period of the program, the overall mean of score level of knowledge respondents regarding the prevention of viral hepatitis B infection in the pre-test period was (0.26±0.14). In the post-test period of the program, the overall mean of score level of knowledge respondents regarding the prevention of viral hepatitis B infection was (0.28±0.14).

Table (4-2-2): Nurses' knowledge toward the prevention of HBV infection (pre and post-test period) for the study group:

Nurses' knowledge items		Pre - test			Post – test		
		M.S	S.D.	Level	M.S	S.D.	Level
1.	**Hepatitis B virus infection is caused by a virus that contains in its genetic composition:**	**0.28**	**0.45**	**L**	**0.96**	**0.20**	**H**
2.	**The viral family to which the hepatitis B virus belongs is called:**	**0.28**	**0.45**	**L**	**0.88**	**0.33**	**H**

3.	Which of these age groups, if their members are infected with hepatitis B virus, most of them do not show symptoms in general?	0.2	0.40	L	1.0	0.00	H
4.	HBV infection is more severe in one of the following age groups:	0.36	0.49	L	0.92	0.27	M
5.	The incubation period for hepatitis B virus after infection ranges as follows:	0.24	0.43	L	0.96	0.20	H
6.	The chance of hepatitis B becoming infected increases from the acute to the chronic phase depending on :	0.28	0.45	L	0.92	0.27	H
7.	Which of the following signs & symptoms are not signs & symptoms of hepatitis B in the acute phase?	0.36	0.49	L	0.92	0.27	H
8.	Which of the following people is not considered to be at high risk of HBV infection?	0.36	0.49	L	0.92	0.27	H
9.	The probability of infection with hepatitis B virus after exposure to contaminated needle sticks is:	0.28	0.45	L	0.92	0.27	H
10.	Which of the following bodily fluids is not considered probable infection unless it contains blood?	0.2	0.40	L	1.0	0.00	H
11.	The hepatitis B virus remains active and contagious on surfaces for:	0.12	0.33	L	0.96	0.20	H
12.	Laboratory diagnosis, when examining the blood for HBV infection, focuses on detecting one of these antigens:	0.44	0.50	L	1.0	0.00	H
13.	The result of a blood test to detect hepatitis B virus is positive after a period of:	0.16	0.37	L	0.84	0.37	H
14.	All patients whose infection does not turn into the chronic phase will have a negative HBV blood test after:	0.16	0.37	L	0.92	0.27	H
15.	Which of the following measures not used to treat and care for hepatitis B patients in the acute phase?	0.24	0.43	L	0.92	0.27	H
16.	Which of the following points are more important than others in hands washing?	0.32	0.47	L	1.0	0.00	H
17.	Wearing the gown when dealing with a person with HBV is required in one of the following cases:	0.24	0.43	L	0.96	0.20	H
18.	When the eyes are exposed to blood or body fluids, they can be washed with one of the following materials:	0.24	0.43	L	1.0	0.00	H
19.	Two pairs of gloves (double gloves) should be worn when handling a HBV patient in one of the following :	0.24	0.43	L	0.92	0.27	H
20.	It is preferable to use one of the following sterile materials when dealing with blood and fluids contaminated with HBV spilled on surfaces for sterilization:	0.24	0.43	L	1.0	0.00	H

21.	When exposed to a puncture with a used needle, it is recommended to deal with that needle by doing one of the following:	0.24	0.43	L	0.8	0.40	M
22.	Immunoglobulin should be taken as soon as possible after exposure when required (preferably within 24 hours) where its effect is not known after:	0.28	0.45	L	1.0	0.00	H
23.	Immunoglobulin gives the body temporary immunity against HBV for a period that lasts:	0.36	0.49	L	1.0	0.00	H
24.	Exposure to contaminated needles and sharp instruments should be reported if the healthcare provider:	0.32	0.47	L	0.96	0.20	H
25.	Which of the following groups cannot be given the hepatitis B vaccine?	0.28	0.45	L	1.0	0.00	H
26.	To manufacture the hepatitis B virus vaccine, one of the following methods is used:	0.28	0.45	L	1.0	0.00	H
27.	HBV vaccine can be given together with immunoglobulin if the condition of the exposed person requires, as follows:	0.28	0.45	L	0.96	0.20	H
28.	A person is considered immune to HBV if he has a level of (anti-HBs) after completing the vaccine doses as at least as follows:	0.16	0.37	L	1.0	0.00	H
29.	When taking the HBV vaccine, we get additional protection from one of the following types of viral hepatitis:	0.16	0.37	L	1.0	0.00	H
30.	In some cases, the person's condition after exposure to infection requires giving more than one dose of immunoglobulin, and it is given as :	0.32	0.47	L	1.0	0.00	H
Total Knowledge Items		0.26	0.15	L	0.95	0.67	H

S.D = Standard Deviation ; M.S = Mean of score ; L= Low level of knowledge (M.S. < 0.5) ; H = High level of knowledge (M.S.≥0.5).

The result in table (4-2-2) shows that there are a significant differences present in the mean score and relative sufficiency of the knowledge respondents toward the prevention of viral hepatitis B infection in the (pre and post-test) period of the education program among nurses enrolled in the study group. There is a low level of knowledge in all items in the pretest period of the program, the overall mean of score level of knowledge respondents regarding the prevention of viral hepatitis B infection in the (pre-test) period was (0.26±0.15). In the (post-test) period of the program, a high level of knowledge is observed in almost all items in

the posttest period of the program, the overall mean of score level of knowledge respondents regarding the prevention of viral hepatitis B infection was (0.95±0.67).

Table (4-2-3):Comparison between the (control and study) groups in the (pre and post-test) period for the level of nurses' knowledge:

Overall Knowledge respondents		Rating	F	%	Cumulative Percent
Study group	Pre-test	Low	24	96.0	96.0
		Moderate	1	4.0	100.0
		High	0	0.0	
		Total	25	100.0	
	Post-test	Low	0	0.0	0.0
		Moderate	3	12.0	12.0
		High	22	88.0	100.0
		Total	25	100.0	
Control group	Pre-test	Low	23	92.0	92.0
		Moderate	2	8.0	100.0
		High	0	0.0	
		Total	25	100.0	
	Post-test	Low	25	100.0	100.0
		Moderate	0	0.0	
		High	0	0.0	
		Total	25	100.0	

Low (R.S. < 66.6); Moderate (R.S.= 66.6-83.3); High (R.S.≥83.4-100); F = Frequency; % = Percentage.

Table (4-2-3) exposed three levels of nurses' knowledge at (pre and post-test) for the two groups (control and study) groups. 96.0% of nurses have had a low level of knowledge in the pretest period of the study group; during the post-test period of the study group, about 12.0% and 88.0% of patients have had a moderate and high level of knowledge. The result reveals a significant difference in the level of knowledge between the (pre and post-test) periods of the study group this indicates that the educational program was effective.

Table (4-2-4):Comparison of nurses' knowledge toward the prevention of HBV infection for the study and control groups between the (pre and post-test) periods:

Groups	Tests	M.S	S.D.	t-value	df.	p-value	Sig.
Study Group	Pre –test	0.26	0.153	22.95	24	0.000	S
	Post-test	0.95	0.067				
Control Group	Pre- test	0.26	0.146	4.28	24	0.09	NS
	Post-test	0.28	0.148				

df=Degree of Freedom; p-value = probability value ; HS= Significant (p-value ≤ 0.05) ; NS=Non- Significant (p-value > 0.05).

Table (4-2-4) displays that is a highly significant difference at p-value (0.000) between the (pre and post-test) of knowledge respondents among nurses enrolled in the study group. In contrast, there is no significant difference at p-value (0.09) in the level of knowledge between the (pre and post- test) of knowledge respondents among nurse's enrolled in the control group.

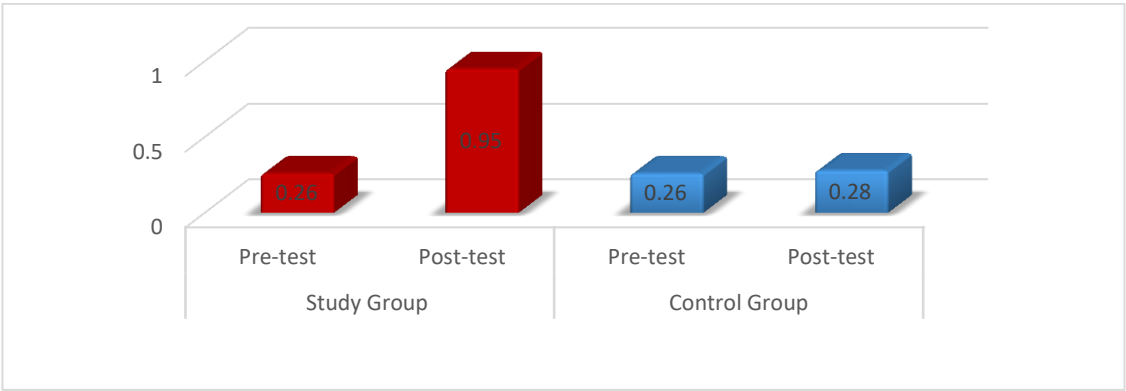


Figure (4-1): Comparison of the overall knowledge respondents for the (control and study) groups at the (pre and post - test) periods.

Figure (4-1) shows the improvement in the nurses' knowledge toward the prevention of viral hepatitis B infection for the study group between(pre and post-test), while the control group exists at the same level between (pre and post - test) periods.

Table (4-3-1):Nurses' attitudes toward the prevention of HBV infection (pre and post-test period) for the control group:

Nurses' attitudes Items		Pretest				Posttest			
		M.S.	S.D.	R.S. (%)	Level	M.S.	S.D.	R.S. (%)	Level
1.	I believe that infection with HBV is not as dangerous as infection with the AIDS virus.	2.68	1.24	53.6	Neg.	2.84	1.10	56.8	Neg.
2.	I believe that hepatitis B infection is not transmitted in the absence of visible blood on the surfaces.	2.96	1.20	59.2	Neg.	3.20	1.00	64	Pos.
3.	I believe it is possible to distinguish between HBV and other types of viral hepatitis clinically.	2.84	0.98	56.8	Neg.	3.04	0.79	60.8	Pos.
4.	I believe that HBV has a specific treatment that cures it completely.	2.68	0.80	53.6	Neg.	2.68	0.55	53.6	Neg.
5.	I believe that the HBV vaccine should not be given more than three doses.	2.40	0.57	48	Neg.	2.68	0.74	53.6	Neg.
6.	I believe the level of (anti-HBs) does not decrease over time after receiving the HBV vaccine.	2.72	0.98	54.4	Neg.	2.84	0.80	56.8	Neg.
7.	I believe there is a need for HBV post-exposure precautions if the person is responsive to the vaccine after a full series of vaccinations, even if the source is infected.	2.16	0.55	43.2	Neg.	2.36	0.63	47.2	Neg.
8.	I believe that exposure to direct contact with the blood and body fluids of the patient is not risk because it does not necessarily lead to infection with the HBV.	3.72	1.27	74.4	Pos.	3.64	0.99	72.8	Pos.
9.	I believe it is not necessary to confirm the response to the HBV vaccine after completing the series of doses.	3.56	0.87	71.2	Pos.	3.52	0.87	70.4	Pos.
10	I believe that people who are already infected with the HBV will not get any benefit, and may harm them when they get the vaccine.	3.20	0.76	64	Pos.	3.12	0.83	62.4	Pos.
Total Attitudes Items		2.89	0.53	57.8	Neg.	2.99	0.44	59.8	Neg.

S.D = Standard Deviation ; M.S = Mean of score ; R.S. = Relative Sufficiency ; Neg.=negative attitudes (R.S. < 60); Pos.=Positive attitudes (R.S.≥60).

The results in table (4-3-1) show that there is no significant change in the mean of score and relative sufficiency of the nurses' attitudes in the (pre and post-test) periods of the educational program among the control group. The greater the mean of score and relative sufficiency of the items, the positive the nurses' attitudes. The overall mean of score of

nurses' attitudes about the prevention of viral hepatitis B infection in the (pre and post-test) periods is (2.89±0.53) and (2.99±0.44) respectively.

Table (4-3-2) Nurses' attitudes toward the prevention of HBV infection (pre and post-test period) for the study group:

Nurses' Attitudes Items		Pretest				Posttest			
		M.S.	S.D.	R.S. (%)	Level	M.S.	S.D.	R.S. (%)	Level
1.	I believe that infection with HBV is not as dangerous as infection with the AIDS virus.	3.24	1.42	64.8	Pos.	4.24	0.52	84.8	Pos.
2.	I believe that HBV infection is not transmitted in the absence of visible blood on the surfaces.	3.12	1.09	62.4	Pos.	4.28	0.54	85.6	Pos.
3.	I believe it is possible to distinguish between HBV and other types of viral hepatitis clinically.	2.56	0.82	51.2	Neg.	3.96	0.35	79.2	Pos.
4.	I believe that HBV has a specific treatment that cures it completely.	3.00	0.95	60	Pos.	4.12	0.44	82.4	Pos.
5.	I believe that the HBV vaccine should not be given more than three doses.	2.52	0.87	50.4	Neg.	4.00	0.50	80	Pos.
6.	I believe the level of (anti-HBs) does not decrease over time after receiving the HBV vaccine.	2.60	0.86	52	Neg.	4.04	0.45	80.8	Pos.
7.	I believe there is a need for HBV post-exposure precautions if the person is responsive to the vaccine after a full series of vaccinations, even if the source is infected.	2.12	0.72	42.4	Neg.	4.04	0.53	80.8	Pos.
8.	I believe that exposure to direct contact with the blood and body fluids of the patient is not risk because it does not necessarily lead to infection with the HBV.	3.68	1.28	73.6	Pos.	4.52	0.58	90.4	Pos.
9.	I believe it is not necessary to confirm the response to the HBV vaccine after completing the series of doses.	3.24	1.01	64.8	Pos.	4.40	0.57	88	Pos.
10.	I believe that people who are already infected with the HBV will not get any benefit, and may harm them when they get the vaccine.	3.04	0.97	60.8	Pos.	4.04	0.67	80.8	Pos.
Total Attitudes Items		2.91	0.53	58.2	Neg.	4.16	0.29	83.2	Pos.

S.D = Standard Deviation ; M.S = Mean of score ; R.S. = Relative Sufficiency ; Pos. = positive attitudes (R.S. ≥ 60); Neg.=negative attitudes (R.S. <60).

The results in table (4-3-2) show that there is a significant change in the mean of score and relative sufficiency of the nurses' attitudes in the

(post-test) period of the educational program among the study group. The greater the mean of score and relative sufficiency of the items, the positive nurses' attitudes. The overall mean of score of nurses' attitudes about the prevention of viral hepatitis B infection in the pre and post-test period is (2.91±0.53) and (4.16±0.29) respectively.

Table(4-3-3):Comparison between the (control and study) groups in the (pre and post-test) period for the level of nurses' attitudes:

Overall attitudes respondents		Rating	F	%	Cumulative Percent
Study group	Pre-test	Negative	16	64.0	64.0
		Positive	9	36.0	100.0
		Total	25	100.0	
	Post-test	Negative	1	4.0	4.0
		Positive	24	96.0	100.0
		Total	25	100.0	
Control group	Pre-test	Negative	16	64.0	64.0
		Positive	9	36.0	100.0
		Total	25	100.0	
	Post-test	Negative	15	60.0	60.0
		Positive	10	40.0	100.0
		Total	25	100.0	

Positive= positive attitudes (R.S. < 60); Negative attitudes (R.S.≥60); F = Frequency; % = Percentage.

Table (4-3-3) indicates two levels of attitudes respondents among nurses enrolled in the (pre and post-test) of the control and study groups. There are no significant differences in the nurses' attitudes levels shown between the study and control groups in the pre-test period. Whereas, there

are a wide difference in attitudes level shown between the (control and study) groups in the post- test period of the program .

Table(4-3-4):Comparison of nurses' attitudes toward the prevention of HBV infection for the study and control groups between the pretest and posttest periods:

Groups	Tests	M.S	S.D.	t-value	df.	p-value	Sig.
Study Group	Pre-test	2.91	0.53	10.54	24	0.000	HS
	Post-test	4.16	0.29				
Control Group	Pre-test	2.89	0.53	1.391	24	0.177	NS
	Post-test	2.99	0.44				

df=Degree of Freedom; p-value = probability value ; HS= Significant (p-value ≤ 0.05) ; NS=Non- Significant (p-value > 0.05).

The study reveal a highly significant difference at p-value (0.000) between the (pre and post-test) attitudes levels among nurses' enrolled in the study group. In contrast, there is no significant difference in the level of the attitude between the (pre and post-test) among nurses' enrolled in the control group. This indicates that the educational program was effective in modifying the nurses' attitudes toward the prevention of viral hepatitis B infection.

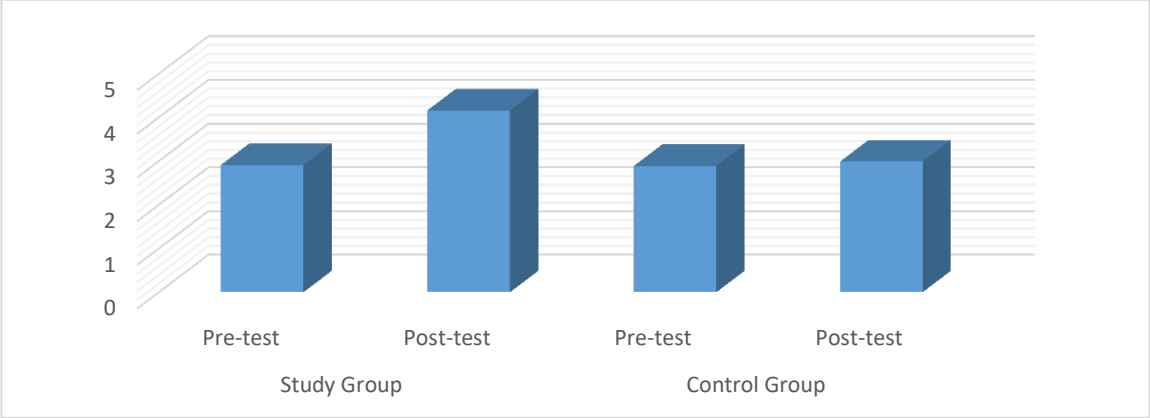


Figure (4-2): Comparison of the overall attitudes of respondents for the (control and study) groups at the (pre and post - test) period.

Figure (4-2) shows the nurses' attitudes toward the prevention of viral hepatitis B infection for the study group between (pre and post-test) was changed for the better, while the control group stay at the same tenet between pre and post-test.

Table(4-4-1):Relationship between the effectiveness of the educational program on the nurses' knowledge with their age groups, level of education, and experience:

Demographic data	Comparative patterns	df	F	p-value	Sig.
Age groups	Between Groups	2	1.347	0.281	NS
	Within Group	22			
Education level	Between Groups	2	4.498	0.023	S
	Within Groups	22			
Experiences	Between Groups	3	0.003	1.000	NS
	Within Groups	21			

df = degree of freedom ; F = F –statistics ;Sig = Level of significant ;S= Significant ; NS= Non - Significant

Table (4-4-1) exposes that there is significant association between the effect of the educational program on nurses' knowledge and their education level; whereas there is no significant association between the effectiveness of the program and the age group, and years of experiences at p value ≤ 0.05 value.

Table (4-4-2):Relationship between the effectiveness of the educational program on the nurses' knowledge with their gender, previous exposed to needle stick injury and participated in training course:

Variables	M.S.	S.D.	t-value	df.	p-value	Sig.
Gender	1.68	.476	11.360	24	0.000	S
Previously exposed to needle stick injury	0.60	0.500	0.808	24	0.427	NS
Participated in the training course	0.12	0.332	8.091	24	0.000	S

t-value = observed T-test ; df = Degree of Freedom ; p- value = probability value ; S= Significant (p-value = <0.05) ; NS = Non – significant (p-value > 0.05) .

Table (4-4-2) shows that there is a significant association between the effectiveness of the educational program on the nurses' knowledge with their ,participation in training courses and gender. While there is no significant association between the effectiveness of the educational program on nurses' knowledge with their, previous exposure to needle stick injury at p- value $\leq$ 0.05 value .

Table(4-4-3):Relationship between the effectiveness of the educational program on the nurses' attitudes with their age groups, level of education, and years of experience:

Demographic data	Comparative patterns	df	F	p-value	Sig.
Age groups	Between Groups	2	0.151	0.861	NS
	Within Groups	22			
Education level	Between Groups	2	1.557	0.233	N.S
	Within Groups	22			
Experiences	Between Groups	3	1.391	0.273	NS
	Within Groups	21			

df = Degree of Freedom ; F = F- statistics ; Sig = Level of significant ; S= Significant ; HS = Highly Significant ; NS= Non - Significant .

Table (4-4-3) shows that there is no significant association between the effectiveness of the educational program on nurses' attitudes and their age groups, level of education, and years of experience at p- value ≤ 0.05 value .

Table(4-4-4): Relationship between the effectiveness of the educational program on the nurses' attitudes with their gender, previous exposure to needle stick injury and participated in training course:

Variables	M.S.	S.D.	t-value	df.	p- value	Sig.
Gender	1.68	0.476	2.583	24	0.016	S
Previously exposed to needle stick injury	0.60	0.500	4.235	24	0.000	S
Participated in training course	0.12	0.332	8.943	24	0.000	S

t-value = observed T-test ; df = Degree of Freedom ; p- value = probability value ; S= Significant (p-value = <0.05) ; NS = Non – significant (p-value > 0.05) .

Table (4-4-4) expose that there is significant association is found between the effectiveness of the educational program on the nurses' attitudes and their gender, previous exposure to needle stick injury, and participation in training courses at p-value ≤0.05 value.

Chapter Five
Discussion of the Results

Discussion of the Results

5.1. Part 1. Socio-demographic characteristics of nurses:

The findings of the present study showed in table (4-1) ages group has participants ranging in age from 20 to 50 years, which indicated that almost of the participants (84.0%) were in the age range (20-30) years, and less than a quorate (68.0%) were the age range (20-30) years of the of the study group. This finding agree with a cohort study that was carried out upon (560) nurse by Al-Busafi et al., (2021) concerned (Assessment of Risk Factors for Hepatitis B Virus Transmission in Oman), they found that the majority of the study sample were nurse and accounted at age groups (< 13, 13–23, > 28) in percentage (52.2%).

In addition, another cross-sectional, prospective study of (328) nurse conducted by Araya Mezgebo and other (2018) included 30 years of age, (81.7%) were also. Furthermore, more than half (52.0%) of the study group of participants in the study group had graduated from a diploma education also high percentage two-thirds (64.0%) of participants in the control group had graduated from a diploma education. This result is inconsistent with design for a quasi- experimental study with(pre and post) test , the (control , study) groups method , use to evaluate the effect of the an educational program about HBV study carried out The sample consists of (60) nurses working in both hospitals by (Mustafa Wahab et al., 2016). In their study that aim to determine the effect of an educational program on knowledge of nurses toward HBV the study conducted at the hospitals of the Nineveh Governorate, they reported that the majority of nurses within level education secondary school of nursing (37%; 57%) of each study, control group, respectively.

In addition, this result in disagree with a ccross-sectional descriptive study done by Clausina et al., (2019) include 150 nurse in the study, a bout HBV seroprevalence in pregnant, who reported that the majority of the participants within level of education college (54.67%).

With respect to participating in training about the prevention of viral hepatitis B infection, the majority (88.0%), and (96.0%) of the study and control groups respectively do not participate in a training course about the prevention of hepatitis B infection, there is findings disagree with cross sectional study by Joukar et al., (2017) among (100) nurses participated, the purpose of this study was to assessing the attitude and knowledge of health-care providers toward HBV, a significant percent of responders (52.9 %) and (55.4%) had satisfactory attitude and knowledge toward HBV.

Mean - score of the knowledge toward HBV was meaningfully among higher educated staff , $p < 0.001$ and immunized staffs ,and (68.0% , and 32.0 %) and of the responders in the study group are females and males respectively the result agree with study done by Reang et al., (2015) The study found that (73.3%) were females and the male of each them have training about the prevention of viral hepatitis B infection , Regarding the years of experience, the majority (80.0%) of the study group, and more than half (52.0%) of the control group had 1-5 years . This findings are consistent with a cross – sectional study (descriptive) conducted by Al - Dossary et al., (2020) in their study (Awareness, Attitudes, Prevention, and Perceptions of HBV infection among nurses in Saudi Arabia), who reported that a large majority 400 (96.3%) size of sample are less than 10 years of experience groups. Also These findings disagree with admixed technique of survey advanced depend on the reporting by checklist as a result of online surveys by Bergman et al., (2019) among (282) nurses participated, the

reason behind this study was for (Assess registered nurses 'experiences of working in the intensive care with patient have hepatitis B), they reported that the majority of the study sample ,more than ten years of experience (42%) the prevention of viral hepatitis B infection.

Furthermore, the current study indicated that both groups had a percentage, 60.0% of the study and control group have been exposed previously to needle-stick injury. This outcome is in line with analytic cross-sectional study, done by Albeladi et al.,(2021) in order to determining the injuries that workers in health institutions are exposed to by needle stick injury, the study was conducted in Saudi Arabia,who stated that most of the study sample were Last year 223 (48.6 %) of exposed previously to needle-stick injury. Also, these findings consistent with a cross sectional study was carried out by Akhuleh, et al., (2019), in the direction of , sharp injury occurrence and related features among hospital staff in wards at a great hazard , they mentioned that all study participants had a history of getting wound by sharp objects at work. However, in this study out of the (306) responders, 250 (81.7%) experienced at least single needle stick injury was recorded in the previous year.

The study believes that the majority of nurses, are young people between the ages of (20- 30) years, as a outcome of the great numeral of nursing graduates in recent years as an outcome of the great numeral of educational institutions that graduate nurses. And that the increase in the percentage of nurses with a diploma is due to the Health Directorate's distribution of nursing staff when employing new personnel, which is based on the available number of nurses and their educational levels. The fact that only a small percentage of the nurses in the current study attended particular hepatitis B courses emphasizes the importance of developing hepatitis B educational programs and involving nurses in these programs.

Because the majority of the nurses in this study are new employees, their years of experience range (1-5) years. The majority of the nurses in the study had been exposed to needle stick injuries while working in the nursing field, which increases their risk of contracting blood-borne diseases like hepatitis B and confirms the need for further educational programs on how to prevent these infections.

5.2. Part 2. Nurses' knowledge toward the prevention of HBV infection (pre and post-test period) for the study group:

The findings of this study indicated shows that there are significant differences present in the mean score and relative sufficiency of the knowledge respondents toward the prevention of viral hepatitis B infection in the (pre, post) test period of the education program among nurses enrolled in the control group., in table (4-2-1), the educational level is the most important factors that helps the nurse to understand the importance of the prevention of viral hepatitis B infection. The outcomes of the current study similar to results of Talib and Ahmed, (2021) they reported Through a quasi-experimental study conducted on a sample of nurses divided into two groups (control and study), that there is a highly-significant difference, between the study group , total results across the two tests periods (pre and post) tests at less than(0.01) p- value, regarding the mean of statistical, according to study's findings, the nurse's knowledge increased at the post-test compared with pre-test. Theses result unsupported by a Quasi- experimental study done by Mustafa Wahab et al. (2016) on a sample of (60) nurse around determine the extent to which nurses' knowledge is affected by an educational program about HBV, they reference that there was no significant difference between practice of prevention of HBV and knowledge in the (pre, and post) tests at (p- value 0.05) of study group.

5.3.Part 3. Comparison between the (pre and post)tests period to the (control and study) groups, for the level of nurses' knowledge:

The result shows that regarding the levels of nurses' knowledge at (pre and post) tests for the two groups (control and study) groups. Whereas, the result of the current study showed that the result reveals a significant difference in the level of knowledge between the (pre and post) tests periods of the study group this indicates that the educational program was effective, in table (4-2-3).

These outcomes are congruent with research done by Machowska and other (2020) who mentioned that there was the study group shows that an educational program is highly effective in improving nurses' knowledge of HBV transmission and prevention in the room of operation, as evidenced by a large significant difference in (pre and post) tests timings respectively, at (p- value = 0.001). among the research group. There was no significant difference in (pre and post) test time in the control group. The research shows that the educational-oriented program was effective for nurses. There were statistical disparities between educational levels and age, which was significant, knowledge from operating room experiences.

5.4.Part 4.Comparison of nurses' knowledge toward the prevention of HBV infection for the study and control groups between the (pre and post-test) periods:

The findings of the study on hand stated that a highly significant difference at (p-value 0.000) between the (pre and post) tests of knowledge respondents among nurses enrolled in the study group, table (4-2-4). This

shows that the educational program was effective in improving the nurse's knowledge about the prevention of viral hepatitis B infection.

The results of the present study go in line with a quasi-experimental design study done by Hilal and Redha (2021), who reported that showed that in the (pre- test), there is a non- significant difference between the (control and study) groups, having a p-value higher than 0.05, while in the post test, there is a significant difference between the (control and study) groups, the study group had p- value less than (0.01) in the post test . After the post-test, nurses in the study group had improved their knowledge of safety measures and prevention for patient with HBV.

On my point of view regarding what was mentioned in Parts (1,2,3) that these results indicate that the educational program was effective, and this is due to the good preparation as well as the effort that the researcher made in implementing the program, and his use of multiple methods to present the scientific material in a smooth and not boring way in attracting the attention of the participants The program as well as the participants' desire to obtain the information they need to prevent hepatitis B infection and to have their questions answered.

5.5.Part 5.Nurses' attitudes toward the prevention of HBV infection (pre and post-test period) for the control, study group

Regarding the no significant change in the mean of score and relative sufficiency of the nurses' attitudes in the (pre and post) test period of the educational program among of each the control, study group, the mean of score indicator nurses' attitudes about the prevention of viral hepatitis B infection in the post -test high compared pre-test period of each group, in table (4-3-1), (4-3-2) respectively. In contrast, the outcome of the

present study was not in line with the research done by El-Sokkary et al., (2020) included assess the attitude and knowledge of nurses and their immune response to HBV vaccination as well as to identify factors affecting their immune response to immunization ,the study found that The results reveal that there is no significant difference between the (control and study) groups in the (pre-test) when the (p-value) is higher than (0.05), but a great significant difference between the (control and study) when the p-value is below 0.01. When it comes to statistics, the study outcomes show that following the intervention, the study group's responses improved. in contrast to the control group, which assigned efficacy to the program, the program's application was more effective. In the study group, nurses' knowledge grades were raised as part of an educational program. this will allow you to confirm the importance or success of implementing the advised program. the results of a study published in the same directory proved that nurses' understanding of hepatitis and its applications. the differences of statistically highly, on the same line, Mustafa Wahab et al., (2016) conducted that significant differences in the attitude and knowledge of nurses following the applying of an educational program about HBV, compared to their knowledge prior to the program's adoption in the study group. The outcomes of the study revealed that there is significant correlation between attitude and knowledge about viral hepatitis B among nurses and several of the demographic features.

5.6.Part 6.Comparison between the (pre and post) tests period to the (control and study) groups, for the nurses' attitude

In relation to the of nurses' attitudes, the current study findings reported that a highly significant difference at p-value (0.000) between the (pre and post) test attitudes among nurses' Participants in the study group, this indicates that the educational program was effective in modifying the

nurses' attitudes toward the prevention of viral hepatitis B infection; the study group between pre and post-test was changed for the better, while the control group stay at the same tenet between pre and post-test , in table (4-3-4).

These findings are consistent with the study done by Kim et al., (2019) included evolution the nurses' attitudes about the prevention of viral hepatitis B infection according to training courses; who mention that The pre-test knowledge score did not show a statistical significant difference between the groups, but the post-test score of attitude was significantly greater in the group of study, than in the group of control (p 0.001).The study group's attitude scores significantly improved from the(pre to post) test (p 0.01). On my point of view regarding parts (6,5), the results confirm the improvement in attitudes of the participating nurses in the study group after implementing the program compared to the control group, indicating that the program was effective in improving knowledge and attitudes at the same time, and this is because the nurses' good knowledge leads to positive attitudes.

5.7.Part 7. Relationship between the effectiveness of the educational program on the nurses' knowledge with their gender, age group, educational level, and years of experience :

The results of this study showed a significant association between the effect of the educational program on nursing staff's knowledge with their gender in a table (4-4-1) this result agree with study done by Rahiman et al., (2018) that reported outcomes show that there was a significant association of gender with scores of knowledge (p-value = 0.001) at a significance level of ($p < 0.05$). and this result disagree with another study conducted by Hilal and Redha (2021), who reported that no

significance association between the effect of the educational program and gender.

According to the finding of the study that a significant association between the effect of the educational program on nurses' knowledge and their education level in a table(4-4-1)and no significant association between the knowledge and previous exposure to needle stick injury at p -value ≤ 0.05 value, a significant association between the effect of the educational program on the nursing staff's knowledge and participation in training courses at p-value (0.000)in a table (4-4-2) these results concord with research by Awad and Hewi (2020) they informed that the level of education of the study subject, the total mean score of knowledge of those with highly educated (bachelor and master degree) was greater than the other educational levels. A significant relation was found between the educational level of the study nurses and their knowledge before (p = 0.002) and following the application the educational program of the study group (P=0.006), Toubasi et al.,. (2015) that found in the study a significant improvement in skills and performance among Jordanian nurses have a training session or training courses about virus B hepatitis prevention transition.

The result disagrees with study by Jabbar and Mohammed (2021) who mention that the study found a statistically significant difference between nursing staffs' age and their knowledge of infection control methods in the post test at p- value of 0.05. These findings indicate that the educational program was more beneficial for the young (25-29). In terms of educational level, the study's findings reveal a no significant difference in educational level and nursing staff knowledge in the post-test at p-value (0.049). The findings revealed that years of experience had statistically significant effect on nursing staff's knowledge of infection control. This

result implies that years of experience have effect on nursing staff's knowledge of infection control. However, these years of expertise should logically have a significant influence in infection control methods.

On my point of view on what was said in Part (7) about the existence of statistical significance in the association between the effect of the educational program and the gender of the program participants, as this could indicate a difference in how males and females deal with the information obtained from the educational program. As for the existence of a statistically significant association between the effect of the educational program and the educational level of the participants, this indicates the importance of increasing the educational level in improving the knowledge level of nurses, which is a logical result where the higher the educational level, the greater the ability to absorb information. The existence of a statistically significant association between the educational program's efficacy and the nurses' knowledge indicates the importance of continuing to conduct educational courses and including nurses in them to expand their knowledge.

5.8. Part 8. Relationship between the effectiveness of the educational program on the nurses' attitudes with their age groups, level of education, and years of experience:

No significant association between the nurses' attitudes and their age groups , educational level , and years of experience at p- value ≤ 0.05 value , in table (4-4-3). Saud and Ali, (2021).They discovered that there is no significant link between nurses' attitudes toward the hepatitis virus and some demographic factors. at p=0.05, there were no statistically significant variations in mean attitude score and demographic features of health care employees.

Furthermore, there is a link between nurses' attitudes and the amount of training courses they have taken (0.05) the result disagree with a study by Gao et al.,(2017) conducted that a significant correlation between the knowledge of nurses around personal protective equipment and their educational level at $p < 0.05$ level , and there has been correlation between the knowledge of nurses about personal protective equipment and their of demographic variables as age group, gender, and training course in infection control and training course in infection control .

5.9. Part 9. Relationship between the effectiveness of the educational program on the nurses' attitudes and their gender, previous exposure to needle stick injury and participated in training course:

There is a significant association is found between the nurses' attitudes and their gender, previous exposure to needle stick injury, and participation in training courses at p-value ≤ 0.05 value, in table(4-4-4). The result is supported with study done by Shil and Upashe, (2020) that showed the effect of video assisted teaching on needle stick injury attitude and knowledge among staff of nursing during of nurses using measures of control and prevention virus B hepatitis transmission by quasi-experimental study used (pre and post) test method , the study presented that the pre-test mean of attitude and knowledge score was 33.66 and 9.5 respectively, which was increased in post -"t"- test value attitude and knowledge (p 0.0001, t= 2.235) considered to be very significant which indicates significant improvement in attitude and knowledge.

On same line other study agree with the result that found by Rahiman et al.,(2018)conducted that significant association between knowledge and gender ($p < 0.05$), attitudes ($p < 0.05$), and practice (p

<0.05) there is significant association between nurses knowledge and attitudes and their gender and an insignificant association with nurse's gender and their practice around needle stick injury prevention procedures. This outcomes might relate to deference of interesting to increase knowledge around needle stick injury prevention procedures with gender of nurses .

This outcomes disagreed with the outcomes obtained from a prior research conducted in yemen by Alwabr, (2018) indicated that there is no relation between nurses' gender and their knowledge of needle stick injury preventive procedures , the outcome supported by EL-Mohamady et al.,(2018) they conducted during study that found the results of this study revealed an insignificant association between the nurses' work experience and their practice and knowledge of needle stick injury prevention and preventive procedures, for the virus hepatitis B; this could be due to adequate needle-stick injury prevention training for the nurses during previous years of employment.

On my point of view regarding to what was mentioned in parts (8,9), about the existence of a statistical significant association between the effect of educational program on the attitudes of the participating nurses and their gender. This may be because there is a disparity between males and females in changing their attitudes towards a specific topic, such as their attitude towards hepatitis B and how to prevent it. And about the existence of a statistical significant association between the effectiveness of the educational program on the attitudes of nurses and their participated in training course , this is a logical conclusion, as the better the knowledge of nurses by participating in educational and training courses, the better their attitudes towards hepatitis B and how to prevent it.

Chapter Six
Conclusions and Recommendations

Conclusions and Recommendations

6.1. Conclusions

Based on the findings of this study, the investigator came to the following conclusion:

1- Most of the nurses participating in the current study are within the age group (20-30) years.
2- The educational level of most nurses participating in this study is a diploma.
3- Years of experience for most nurses participating in the current study ranged from (1-5) years.
4- The largest proportion of the nurses participating in the current study had not participated in previous education courses on hepatitis B and its prevention.
5- Knowledge and attitudes towards hepatitis B virus and its prevention among nurses in the pre-test assessment were low for the study and control group.
6- The results showed significant relationship between the knowledge and some demographic data (education level, gender and participate in a training course), and significant relationship between the attitudes and some demographic data (gender and participate in a training course).
7- The current study shows that the educational program was effective in improving nurses' knowledge and attitudes of the study group towards hepatitis B and its prevention. While the control group remained at the same level of knowledge and attitudes in the post test.

6.2. Recommendations

The investigator made the following recommendations based on the study's findings:

1- Exerting more efforts by the continuing education units in the health directorates to develop and update the nurses' knowledge, and improve their attitudes about viral hepatitis B.
2- Encouraging nurses to develop their educational level by obtaining higher academic degrees.
3- Nurses are evaluated on a periodically to determine their level of knowledge about the prevention of hepatitis B.
4- Including special courses in the training program for new nurses about the prevention of blood-borne infections in general, and hepatitis B in particular, to improve their knowledge and attitudes about the prevention of these diseases.
5- Emphasizing the importance of delivering the vaccine to all health workers, especially nurses, and then following up with the necessary testing to see how they responded to the vaccine, by the public health department.
6- Creating posters about hepatitis B virus and posting them near the nurses' work to remind them of the disease's risks, modes of transmission, and how to prevent it, by the public health department.

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Appendixes

Appendix A
Administrative Agreements

جمهورية العراق

محافظة كربلاء المقدسة
دائرة صحة كربلاء المقدسة
مركز التدريب والتنمية البشرية
شعبة ادارة المعرفة
وحدة البحوث
العدد: ٢٩٢٣
التاريخ / ٢٠٢١ / ١٢ / ٢

Holy Karbala governorate
Karbala Health Department
General manager's office
Training and Human Development Center

إلى/ جامعة كربلاء / كلية التمريض
الموضوع /تسهيل مهمة

تحيه طيبه....

كتابكم المرقم ١١٤ في ٢٠٢١/١١/٢٨

نود إعلامكم بأنه لا مانع لدينا من تسهيل مهمة الطالب (عادل محمد جياد) دراسات عليا لإنجاز بحثه الموسوم حول: (تاثير برنامج تعليمي في معرفة الكادر التمريضي وموقفهم تجاه الوقاية من عدوى التهاب الكبد الفايروسي B في مركز كربلاء لامراض وجراحة القلب)) في مؤسستنا الصحية/ مركز كربلاء لامراض وجراحة القلب/ الدكتور(صالح يحيى جواد) على ان لا تتحمل دائرتنا اي نفقات مادية مع الاحترام ٠

٠

الدكتورة
تقوى خضر عبد الكريم
مديرة مركز التدريب والتنمية البشرية
٢٠٢١/١٢/ ٢

نسخة منه الى
مركز التدريب والتنمية البشرية مع الأوليات/ شعبة ادارة المعرفة/ وحدة البحوث مع الاوليات

Appendix B
Ethical Considerations

Ministry of Higher Education and Scientific Research
University of Karbala / College of Nursing
Scientific Research Ethics Committee

وزارة التعليم العالي والبحث العلمي
جامعة كربلاء / كلية التمريض
لجنة اخلاقيات البحث العلمي

استمارة اخلاقيات البحث العلمي

عنوان مشروع البحث	
English	بالغة العربية
Effect of an Educational Program on Nursing Staff Knowledge and Attitude toward Prevention of Viral Hepatitis B Infection at Kerbala Center for Cardiac Diseases and Surgery	اثر برنامج تعليمي في معرفة الكادر التمريضي وموقفهم تجاه الوقاية من عدوى التهاب الكبد الفيروسي B في مركز كربلاء لأمراض وجراحة القلب

بيانات عن الباحث الرئيسي			
الاسم الثلاثي	اللقب العلمي او العنوان الوظيفي	رقم الهاتف/ الموبايل	الايميل
عادل محمد جياد	طالب ماجستير	٠٧٧٠٤٩١٩٤٧١	adil.m@s.uokerbala.edu.iq

بيانات الباحث او الباحثين المشتركين			
الاسم الثلاثي	اللقب العلمي او العنوان الوظيفي	رقم الهاتف/ الموبايل	الايميل
لا يوجد			

اهمية موضوع البحث واهدافه (Importance of the research and its objectives)

التهاب الكبد الفيروسي B مرض معدي خطير ينتقل عن طريق الدم يمكن الوقاية منه ، ومن الاشخاص الاكثر عرضة للإصابة به العاملين في المجال الصحي ومنهم الممرضين ،وفي مركز امراض وجراحة القلب يتعرض الممرضين الى خطر الاصابة المحتملة بالمرض من خلال تعرضهم للملامسة المباشرة لدم المريض عند تقديم الاجراءات التمريضية والعلاجية . لذلك فان زيادة مستوى المعرفة لدى الممرضين وتحسين مواقفهم امر مهم لحمايتهم وحماية الاخرين من المرض وتعليمهم كيفية الوقاية منه ، وخاصة عند وجود انخفاض في مستوى المعرفة .اهداف البحث: 1- تقييم معرفة وموقف الكادر التمريضي تجاه التهاب الكبد B والوقاية منه.2- وضع برنامج تعليمي3- تقييم أثر البرنامج التعليمي4- التعرف على العلاقة بين معرفة وموقف الكادر التمريضي وبين خصائصهم الديموغرافية.

وقت ومكان اجراء البحث (الاماكن المقترحة لأجراء البحث فيها) Time and Setting of the Research

وقت اجراء البحث للفترة من 1\11\2021 الى 16\6\2022 . مكان البحث في مركز كربلاء لأمراض وجراحة القلب

منهجية البحث (Methodology)

تصميم دراسة البحث شبه تجريبية ، حيث يتم تقييم معرفة وموقف الكادر التمريضي حول التهاب الكبد الفيروسي B عن طريق استعمال الاستبانة ،ومن ثم يتم انشاء برنامج تعليمي حول المرض وتقديمة الى الكادر التمريضي ، بعدها يتم اعادة التقييم لمعرفة مدى تأثيرهم البرنامج التعليمي على معارفهم وموقفهم تجاه الوقاية من عدوى التهاب الكبد الفيروسي B.

عينة الدراسة Sample of the study

مجموعة من الممرضين العاملين في مركز كربلاء لأمراض وجراحة القلب من مختلف درجات التحصيل الدراسي في مجال التمريض .

الاعتبارات الاخلاقية خلال اجراء البحث (Ethical consideration during research)

التعهد

- اني الموقع ادناه (عادل محمد جياد) اتعهد بان اقوم باجراء البحث وفقا لما ذكر في البروتوكول اعلاه وان التزم باتباع القوانين والتعليمات فيما يخص اجراء البحوث والالتزام بأخلاقياتها ، كما واتعهد باخذ الموافقة من افراد العينة للمشاركة في الدراسة واخذ موافقة من ولي أمر المشارك الشرعي في حال كون عمر الشخص المشارك اقل من 18 سنة، او كونه غير قادر على الفهم ، وان اقدم الإيضاحات و المعلومات الخاصة بالدراسة لافراد العينة للمشاركين في حال طلبها. وان اتعامل بسرية تامة مع بيانات افراد العينة.

اسم وتوقيع الباحث
عادل محمد جياد

توصية لجنة اخلاقيات البحوث في الكلية

نحن اعضاء اللجنة الاخلاقية نوصي بان موضوع الباحث : ذو قيمة علمية ومهم للمجتمع والمريض

رئيس اللجنة أ.د. علي كريم حسين | عضو | عضو | عضو | عضو

Appendix C
Preliminary Assessment and Result

ت	السؤال	الإجابة				التقييم
		صح		خطأ		
		العدد	%	العدد	%	
1	**الفيروس المسبب لالتهاب الكبد الفيروسي B هو فيروس يحتوي على :** ١- DNA ثلاثي الشريط جزئيا ٢- RNA احادي الشريط جزئيا ٣- RNA ثلاثي الشريط جزئيا ٤- ما ذكر اعلاه غير صحيح	2	20%	18	80%	L.
2	**احد انواع التهاب الكبد الفيروسي التالية لا يصاب به الانسان الا اذا كان مصاب بالتهاب الكبد الفيروسي B** ١- التهاب الكبد الفيروسي C ٢- التهاب الكبد الفيروسي A ٣- التهاب الكبد الفيروسي E ٤- ما ذكر اعلاه غير صحيح	3	15%	17	85%	L.
3	**يبقى فيروس التهاب الكبد الفيروسي B فعالا وقابلا للعدوى على الاسطح وخارج الجسم لمدة :** ١- ٣٦ ساعة . ٢- اقل من ٤٨ ساعة. ٣- لا تزيد عن ثلاثة ايام . ٤- ما ذكر اعلاه غير صحيح	6	30%	14	70%	L.
4	**احد هذه الحالات المرضية من مضاعفات التهاب الكبد الفيروسي B الشائعة بالإضافة الى سرطان الكبد على المدى البعيد** ١- سرطان البنكرياس الاولي ٢- سرطان الكلية الاولي ٣- كلا الاجابتين السابقتين(١ و ٢) صحيح . ٤- ما ذكر اعلاه غير صحيح .	7	35%	13	65%	L.
5	**غالبا لا تظهر علامات و اعراض التهاب الكبد الفيروسي B على احدى الفئات العمرية التالية :** ١- الاطفال دون سن الخامسة ٢- الاطفال فوق سن الخامسة الى سن التاسعة عشرة ٣- مرحلة الشباب وكبار السن ٤- ما ذكر اعلاه غير صحيح .	2	10%	18	90%	L.
6	**تتشابه الاعراض السريرية لا لتهاب الكبد الفيروسي B مع باقي انواع التهاب الكبد الفيروسي** ١- اتفق ٢- لا اتفق	4	20%	16	80%	L.

7	**الادوات المستعملة التي لا تظهر عليها اثار الدم او سوائل الجسم فإنها :** ١- امنة من عدوى التهاب الكبد الفيروسي B ويمكن استعمالها دون الحاجة الى تعقيمها ٢- امنة من عدوى التهاب الكبد الفيروسي B ولكن تعقم للاحتياط قبل استعمالها ٣- امنة من عدوى التهاب الكبد الفيروسي B ولكن يجب تعقيمها قبل استعمالها ٤- ما ذكر اعلاه غير صحيح.	4	20%	16	80%	L.
8	**للوقاية من التهاب الكبد الفيروسي B يجب تجنب احد الامور التالية :** ١- تناول الاطعمة والمشروبات من مصادر غير معروفة مثل(الباعة المتجولين) ٢- الاقتراب لمسافة قريبة من المصاب دون ارتداء معدات الوقاية الشخصية ٣- تعرض الجلد الغير سليم (كالجروح والتشققات) مباشرة لدم وسوائل المريض ٤- كل ما ذكر اعلاه صحيح	5	25%	15	75%	L.
9	**تتراوح فترة حضانة التهاب الكبد الفيروسي B بعد التعرض للإصابة:** ١. ١٥-٢٥ يوم ٢. ٢٠-٣٥ يوم ٣. ٣٠-٤٥ يوم ٤. ما ذكر اعلاه غير صحيح	2	10%	18	90%	L.
10	**التهاب الكبد الفيروسي B يتحول الى الطور المزمن اذا استمر المرض لمدة :** ١. اكثر من ٣ اشهر ٢. اكثر من ٥ اشهر ٣. اكثر من سنة ٤. ما ذكر اعلاه غير صحيح	3	15%	17	85%	L.
11	**تتأكد الاصابة بالتهاب الكبد الفيروسي B عن طريق :**١ . فحص وظائف وانزيمات الكبد مثل (ALT , AST) ٢.علامات واعراض المرض ٣.الفحص السريري والسونار ٤.ما ذكر اعلاه غير صحيح	4	20%	16	80%	L.
12	**تبلغ نسبة احتمال الاصابة بالتهاب الكبد الفيروسي B عن طريق الوخز بالإبر والادوات الحادة الملوثة :** ١. ٠,٣% ٢. ٣% ٣. ٢ - ٥ % ٤. ما ذكر اعلاه غير صحيح	2	10%	18	90%	L.

13	**اجب بصح او خطا : يعتبر التهاب الكبد الفيروسي B من الامراض التي لا يمكن الوقاية منها عن طريق المناعة الجاهزة {المصل (الكلوبيولين المناعي) } ؟** ١- صح ٢- خطا	2	10%	18	90%	L.
14	**يزداد احتمال تحول التهاب الكبد الفيروسي B من الطور الحاد الى الطور المزمن كلما قل عمر الشخص المصاب** ١- صح ٢- خطأ	4	20%	16	80%	L.
15	**توجد علاجات تعطى للشخص المصاب بالتهاب الكبد الفيروسي B المزمن لمنع او تقليل مضاعفات المرض؟** ١- اتفق ٢- لا اتفق	17	85%	3	15%	H.
16	**ليس من الضروري جدا اجراء الفحوصات للكشف عن التهاب الكبد الفيروسي B قبل العملية للأشخاص الذين ليس لديهم علامات واعراض المرض حيث ان المصاب بالتهاب الكبد الفيروسي B يعاني دوما من اليرقان الذي يكون ظاهر بوضوح في العينين والبشرة** ١- اتفق ٢- لا اتفق	12	60%	8	40%	M.
17	**تزيد خطورة الاصابة بالتهاب الكبد الفيروسي B عند الاشخاص في ما يأتي عدا:** ١- الاشخاص الذين يعانون من ارتفاع الضغط في الشريان الرئوي المزمن ٢- الاشخاص الذين يعانون من داء السكري المزمن ٣- الأشخاص المصابون بأمراض الكبد المزمنة. ٤- الاجابتين في الخيارين (٢ ،١) صحيحتين	3	15%	17	85%	L.
18	**يتم ارتداء الكمامة اثناء التعامل مع المريض المصاب بالتهاب الكبد الفيروسي B لان الفيروس ينتقل عن طريق الهواء الملوث .** ١- اتفق ٢- لا اتفق	5	25%	15	75%	L.
19	**يحتوي لقاح التهاب الكبد الفيروسي B على :** ١- فيروس حي مضعف ٢- فيروس مقتول ٣- المادة السمية التي يفرزها الفيروس ٤- ما ذكر اعلاه غير صحيح	1	5%	19	95%	L.

20	**اخـذ اللقـاح بالنسـبة للعـاملين فـي القطـاع الصـحي لـيس ضـروريا جـدا اذا تـم الالتـزام بـإجراءات السـلامة المهنيـة مثـل ارتـداء عـدة الحماية الشخصية واتباع خطوات الحقن الامـن والـتخلص الامـن مـن النفايـات الطبيـة الملوثـة وغيرها من تدابير السلامة** ١- اتفق ٢- لا اتفق	**11**	**55%**	**9**	**45%**	**M.**
المجموع		**99**	**24.75 %**	**301**	**75.25 %**	**L.**

Low (L.) =If the correct answers <50% ; Moderate(M.)= If the correct answers ≥ 50% ; High (H.)= If the correct answers ≥ 70% ; percentage = %

Appendix D
Educational Program

نظرة عامة :

يركز البرنامج التعليمي على معارف الممرضين بفيروس التهاب الكبد B والوقاية منه ، ويركز على القضايا والتوجهات المرتبطة بتلك المعارف كما هو موضح في أهداف البرنامج ومحتوياته.

أهداف البرنامج:

الهدف العام

الغرض من البرنامج هو تزويد العاملين في مجال الرعاية الصحية (الممرضين) بفرص لمعرفة المزيد عن التهاب الكبد B وكيفية الوقاية منه ، وكذلك لتغيير توجهاتهم تجاه المرض ، حتى يتمكنوا من حماية أنفسهم ، المرضى ، وغيرهم من خطر الإصابة.

الأهداف الخاصة

يجب أن يكون المشاركون قادرين على التمييز وفهم ما يلي بعد الانتهاء من البرنامج:

١. تعريف فيروس التهاب الكبد B ومعرفة خصائص الفيروس.
٢. التعرف على طرق انتقال المرض.
٣. معرفة الأشخاص الأكثر عرضة للإصابة بالتهاب الكبد الفيروسي B.
٤. التعرف على تشخيص وعلاج المرض.
٥. تحديد الاحتياطات القياسية اللازمة للوقاية من المرض.
٦. التعرف على أهمية اللقاح للوقاية من المرض.
٧. معرفة الإجراءات الوقائية بعد التعرض (الوقاية بعد التعرض) وكيفية القيام بها حسب الحالة المناعية للشخص.

طرق ووسائل التدريس:

١. طريقة إلقاء المحاضرة القصيرة.
٢. إعداد وتقديم المحاضرة باستخدام برنامج بور بوينت.
٣. استخدام أسلوب المناقشة الجماعية.
٤. استخدام السبورة .

مكان وزمان المحاضرة:

قاعة المحاضرات في مركز كربلاء لأمراض وجراحة القلب ، مدة المحاضرة ٦٠ دقيقة.

محتويات البرنامج كالتالي:

رقم المحاضرة	المحتويات	وقت وتاريخ المحاضرة	رقم الصفحة
المحاضرة الاولى	**المقدمة :** • تاريخ التهاب الكبد الفيروسي B • وبائية التهاب الكبد B • وصف فيروس التهاب الكبد B • أطوار التهاب الكبد الفيروسي B أ- التهاب الكبد الفيروسي B الحاد ب- التهاب الكبد الفيروسي B المزمن • مضاعفات عدوى التهاب الكبد الفيروسي B أ-في حالة الاصابة الحادة ب- في حالة الاصابة المزمنة • علامات وأعراض عدوى التهاب الكبد الفيروسي B	٢٠٢٢\٣\١٣ **٩:٣٠ص**	٤-٧
المحاضرة الثانية	**انتقال فيروس التهاب الكبد B ، التشخيص ، العلاج :** • انتقال عدوى التهاب الكبد الفيروسي B • الاشخاص المعرضون لخطر عدوى الإصابة بفيروس التهاب الكبد B • التعرض المهني للعاملين في مجال الرعاية الصحية لفيروس التهاب الكبد B • العلاقة بين التهاب الكبد الفيروسي D و التهاب الكبد الفيروسي B • تشخيص الإصابة بفيروس التهاب الكبد B • علاج التهاب الكبد الفيروسي B	٢٠٢٢\٣\١٤ **٩:٣٠ص**	٧-١٠
المحاضرة الثالثة	**الوقاية من عدوى التهاب الكبد B:** • التحصين ضد الالتهاب الكبد B أ. التحصين النشط (Active Immunization: التطعيم (اللقاح) - جدول اللقاحات ضد التهاب الكبد B - الأشخاص الذين يحتاجون للتطعيم ضد التهاب الكبد B ب -التحصين السلبي (passive immunization): الكلوبيولين المناعي لالتهاب الكبد B (HBIG) • حماية العاملين في مجال الرعاية الصحية من فيروس التهاب الكبد B	٢٠٢٢\٣\١٥ **٩:٣٠ص**	١٠-١٢

المحاضرة الرابعة	**تدابير ما قبل التعرض :** - التعليم والتدريب - تطعيم العاملين في مجال الرعاية الصحية - الاختبارات المصلية قبل وبعد التطعيم للعاملين في مجال الرعاية الصحية - الاحتياطات القياسية لمكافحة العدوى: غسل اليدين الكفوف المريلة والعباءة (الكاون) أقنعة الوجه (الماسك) ،ودرع الوجه والنظارات(حماية العينين) البياضات والغسيل تطهير الدم \ سوائل الجسم المنسكبة التخلص من الإبر والأدوات الحادة الأخرى التخلص من النفايات	**٢٠٢٢\٣\١٦** **٩:٣٠ص**	**١٢-١٦**
المحاضرة الخامسة	**الوقاية بعد التعرض :** • الإدارة الأولية ما بعد التعرض • الوقاية بعد التعرض لعاملي الرعاية الصحية الملقحين • تدابير ما بعد التعرض لعاملي الرعاية الصحية الذين ليس لديهم توثيق للتطعيم ، أو لم يتم تطعيمهم أو لم يكملوا جرعات اللقاح • اختبار عامل الرعاية الصحية الذي تعرض لمصدر مصاب (مريض مصاب) او مصدر مجهول	**٢٠٢٢\٣\١٧** **٩:٣٠ص**	**١٧- ٢٠**

المحاضرة الأولى

المقدمة

التهاب الكبد هو عدوى في الكبد تسبب الالتهاب. يحدث التهاب الكبد بشكل أكثر شيوعًا بسبب فيروسات التهاب الكبد ، على الرغم من أنه يمكن أن يكون أيضًا بسبب مسببات العدوى الاخرى ، والمواد السامة (مثل الكحول وبعض الأدوية)، وأمراض المناعة الذاتية . التهاب الكبد الفيروسي هو تهديد عالمي للصحة العامة بالمقارنة مع فيروس نقص المناعة البشرية ، والسل ، والملاريا ، من بين الأمراض المعدية الأخرى الهامة.

يتم تصنيف فيروسات التهاب الكبد إلى خمسة أنواع: A و B و C و D و E. يعتبر تناول الأطعمة أو المشروبات الملوثة السبب الأكثر شيوعًا لالتهاب الكبد A و E. بينما ينتقل التهاب الكبد B و C و D بشكل شائع عن طريق الحقن او الملامسة المباشرة مع الدم و سوائل الجسم الملوثة.

يُعرَّف فيروس التهاب الكبد B بأنه عدوى الكبد التي يمكن الوقاية منها باللقاح والناجمة عن فيروس التهاب الكبد B (HBV) . وينتمي الى عائلة فيروسية تسمى (هيبادنافاردیا) ويصنف على أنه من الفيروسات التي تحتوي على الـ (DNA) لأنه يحتوي على الحمض النووي (DNA) في تركيبته الجينية.

تاريخ التهاب الكبد الفيروسي B

يعود تاريخ التهاب الكبد الفيروسي إلى آلاف السنين. يمكن تتبع الأدلة المكتوبة على تفشي اليرقان الوبائي إلى عدة آلاف من السنين قبل المسيح . هناك تقارير عن أوبئة اليرقان منذ ٥٠٠٠ عام في الصين وأكثر من ٢٥٠٠ عام في بابل. ان أوبئة اليرقان الكبيرة لها ماض مأساوي ، وكثيراً ما ترتبط بالحروب الكبيرة. تم الإبلاغ عن ٤٠،٠٠٠ حالة بين قوات الاتحاد خلال الحرب الأهلية الأمريكية.

كان التهاب الكبد B من أوائل الأمراض المنقولة عن طريق الدم التي تم اكتشافها عند البشر. اكتشف الدكتور باروخ بلومبرج "مستضد أستراليا" في عام ١٩٦٥ ، والذي تم التعرف عليه لاحقًا على أنه مستضد سطح فيروس التهاب الكبد B (HBsAg). حصل الدكتور بلومبرج على جائزة نوبل في علم وظائف الأعضاء أو الطب عام ١٩٧٦ عن عمله هذا.

في عام ١٩٨٦ ، تم إنشاء لقاح HBV شديد النقاوة والذي انتاجه بواسطة الهندسة الوراثية (أو الحمض النووي المؤتلف) ولم يتضمن أي مكونات للدم . أوصت منظمة الصحة العالمية (WHO) في عام ١٩٩١ بأن تدمج جميع الدول لقاح التهاب الكبد B في برامج التطعيم في بلادهم .

وبائية التهاب الكبد B

في عام ٢٠١٩ ، قدرت منظمة الصحة العالمية أن ٢٩٦ مليون شخص يعانون من عدوى التهاب الكبد B المزمنة ، مع ١,٥ مليون إصابة جديدة كل عام. في عام ٢٠١٩ ، كان ٣٠,٤ مليون شخص (حوالي ١٠٪ من جميع المصابين بالتهاب الكبد B) على دراية بإصابتهم ، وتلقى ٦,٦ مليون (٢٢٪ من المصابين) العلاج . تسبب التهاب الكبد B في وفاة ما يقدر بنحو ٨٢٠ ألف حالة

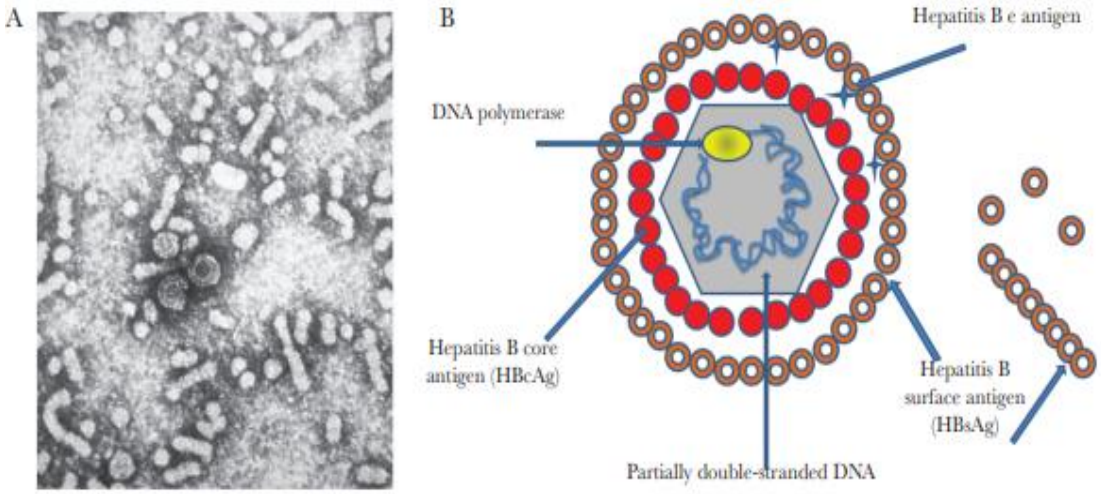
وفاة في عام ٢٠١٩ ، كان معظمها بسبب تليف الكبد وسرطان الخلايا الكبدية (سرطان الكبد الأولي).

يتم تصنيف البلدان وفقًا لانتشار عدوى التهاب الكبد B المزمن إلى [انتشار مرتفع (٨٪) ، وانتشار متوسط (٥٪ -٧,٩٪) ، وانتشار اقل من المتوسط (٢٪ - ٤,٩٪) ، وانتشار منخفض (١,٩٪)]. وفقًا لهذا التصنيف ، يعد العراق من بين الدول ذات معدل انتشار منخفض لفيروس التهاب الكبد B المزمن.

وصف فيروس التهاب الكبد B

فيروس التهاب الكبد B هو فيروس مغلف ٤٠-٤٢ نانومتر. يحتوي HBV على جينوم DNA دائري مزدوج الشريط . **(لاحظ شكل رقم ١)** يدخل الفيروس الكبد عن طريق الدورة الدموية بمجرد تعرض الشخص الضعيف. يتم تقسيم HBV إلى نظامين تصنيفين : النوع الفرعي المصلي والنمط الجيني A - J. هي الأنماط الجينية العشرة لفيروس التهاب الكبد التي تم تحديدها . جغرافيًا ، تختلف الأنماط المصلية والأنماط الجينية لـ HBV. غالبًا ما تُمنح المناعة ضد جميع الأنماط الجينية عن طريق العدوى أو التحصين بنمط وراثي واحد.

ينتج فيروس التهاب الكبد B عددًا صغيرًا من البروتينات الفيروسية أو المستضدات التي يمكن اكتشافها في الدم. قد تتطور الأجسام المضادة لكل مستضد استجابةً لعدوى فيروس التهاب الكبد B. المستضد السطحي لفيروس التهاب الكبد B (HBsAg) هو الغلاف البروتيني الخارجي للفيروس. المستضد الأساسي لفيروس التهاب الكبد B (HBcAg) موجود فقط في الكبد وليس في الدم ، و يمكن اكتشاف الجسم المضاد (anti-HBc) في الدم ويوحي وجوده في الدم على وجود العدوى. المستضد الفيروسي e (HBeAg) هو ثالث بروتين يفرز من فيروس التهاب الكبد B، يرتبط وجوده بارتفاع معدل العدوى الفيروسية والتكاثر الفيروسي النشط . ومع ذلك ، فإن غياب HBeAg لا يستبعد المرض النشط ، حيث يمكن أن يكون لدى بعض الأشخاص فيروسات متحولة غير قادرة على التعبير عن مستضد e ، مما يؤدي إلى ظهور التهاب الكبد الفيروسي B المزمن السلبي النشط .



شكل رقم (١) A\ صورة بالمجهر الإلكتروني لفيروس التهاب الكبد B

B \مستضدات السطح واجزاء الفيروس في مخطط مبسط لجسيم فيروس التهاب الكبد B

أطوار التهاب الكبد الفيروسي B

أ- التهاب الكبد الفيروسي B الحاد

هو مرض قصير الأمد يتطور خلال الأشهر الستة الأولى بعد تعرض شخص ما لفيروس التهاب الكبد B . يمكن أن لا يسبب التهاب الكبد B الحاد أي أعراض أو مجرد مرض متوسط الشدة لدى بعض الأشخاص. وقد يتسبب التهاب الكبد B الحاد في مرض أكثر خطورة لدى بعض الأشخاص ، مما يتطلب دخول المستشفى . لا تظهر أي أعراض على معظم الأشخاص المصابين بالعدوى الحادة ، وخاصة الأطفال الصغار وحديثي الولادة المولودين لأمهات مصابات بفيروس التهاب الكبد B .

يمكن أن تتراوح العدوى الحادة من مرض عديم الأعراض أو مرض خفيف إلى التهاب الكبد الخاطف ، والذي يحدث فقط في حالات نادرة. يكون المرض أكثر حدة عند الأشخاص الذين تزيد أعمارهم عن ٦٠ عامًا . يشير استمرار حدوث HBV الحاد عند البالغين إلى أن الأساليب الحالية لمنع انتقال HBV غير كافية وأن هناك حاجة إلى مزيد من الجهود الوقائية.

ب- التهاب الكبد الفيروسي B المزمن

يعتبر التهاب الكبد الفيروسي B المزمن أكثر أهمية من التهاب الكبد B الحاد من حيث الصحة العامة لأنه يسبب المرض والوفاة على المدى الطويل ، ويعمل كمستودع لانتقال المرض إلى الاشخاص السليمين . تختلف نسبة المرضى المصابين الذين لا تشفى إصابتهم وتصبح اصابتهم مزمنة بعد الإصابة الحادة مع تقدم العمر. يختلف خطر الإصابة بالعدوى المزمنة حسب العمر عند الإصابة وهو أكبر بين الأطفال الصغار. يبقى ما يقرب من ٩٠٪ من الرضع و (٢٥-٥٠٪) من الأطفال الذين تتراوح أعمارهم بين ١-٥ سنوات مصابين بشكل مزمن بفيروس التهاب الكبد B. من ناحية أخرى ، يتعافى البالغون تمامًا من الإصابة بفيروس التهاب الكبد B ولا يصابوا بالعدوى المزمنة في حوالي ٩٥٪ من الحالات .

مضاعفات عدوى التهاب الكبد الفيروسي B

يمكن أن يُصاب الأشخاص المصابون بالتهاب الكبد الحاد بفشل كبدي حاد ، مما قد يؤدي إلى الوفاة. من بين المضاعفات طويلة الأمد للعدوى بفيروس التهاب الكبد B ، تصاب مجموعة من الأشخاص بأمراض الكبد المتقدمة مثل تليف الكبد وسرطان الخلايا الكبدية ، مما يؤدي إلى ارتفاع معدلات المراضة والوفيات . تشمل مضاعفات عدوى التهاب الكبد الفيروسي B:

أ-في حالة الاصابة الحادة ١- التهاب الكبد الخاطف في <١٪ من الحالات والذي قد يؤدي للوفاة. ٢- الحاجة الى دخول المستشفى .

ب- في حالة الاصابة المزمنة ١- تليف الكبد. ٢- سرطان الخلايا الكبدية. ٣- الموت .

علامات وأعراض عدوى التهاب الكبد الفيروسي B

لا يعاني معظم الأطفال دون سن الخامسة ، وكذلك أولئك الذين يعانون من حالات صحية خطيرة (مثل ضعف جهاز المناعة) ، من أي أعراض. تؤثر أعراض التهاب الكبد B الحاد على ما يصل إلى نصف الأطفال الأكبر سنًا وكذلك على المراهقين والبالغين . (الحمى ، والتعب ، وفقدان الشهية

، والغثيان ، والقيء ، وعدم الراحة في البطن ، والبول الداكن ، اللون الطيني للبراز ، وآلام المفاصل ، واليرقان (اللون الأصفر في الجلد أو العينين) كلها أعراض التهاب الكبد B الحاد.

معظم المرضى المصابين بفيروس التهاب الكبد B المزمن ليس لديهم أعراض ولا يشعرون بالمرض ويمكن أن يمروا لعقود دون أن يعانون من أي أعراض. في حالة حدوث الأعراض ، فإنها تشبه أعراض العدوى الحادة ، ولكنها قد تشير إلى مرض كبدي متقدم.

المحاضرة الثانية

انتقال عدوى التهاب الكبد الفيروسي B

تنتقل عدوى فيروس التهاب الكبد B بشكل أكثر شيوعًا من الأم إلى الطفل أثناء الولادة (انتقال في الفترة المحيطة بالولادة) أو أفقيًا (التعرض للدم الملوث) ، خاصة من طفل مصاب إلى طفل غير مصاب ، في المناطق الموبوءة بشدة. الرضع المصابون بالعدوى من خلال أمهاتهم أو قبل سن الخامسة هم أكثر عرضة للإصابة بعدوى مزمنة .

يمكن أن تؤدي إصابات وخز الإبرة والوشم وثقوب الجلد والتعرض للدم الملوث وسوائل الجسم الأخرى مثل سوائل الدورة الشهرية والمهبلية والمنوية إلى انتشار فيروس التهاب الكبد B. يبقى فيروس التهاب الكبد B فعالا وقابلا للعدوى على الاسطح لمدة ٧ ايام على الاقل حتى في حالة عدم وجود دم مرئي . وفترة حضانة فيروس التهاب الكبد B هي ٧٥ يوماً في المتوسط لكنها قد تتراوح بين (٣٠ - ١٨٠) يوماً.

يمكن أيضًا أن ينتقل الفيروس إلى أولئك الذين يحقنون المخدرات عن طريق إعادة استخدام الإبر أو الحقن أو الأدوات الحادة الملوثة في الرعاية الصحية أو الأوساط المجتمعية. ينتشر الالتهاب الكبدي B عن طريق الأنشطة التي تتم على الجلد (ثقب الجلد) أو ملامسة الغشاء المخاطي للدم أو سوائل الجسم الملوثة . ويمكن ان يشمل ذلك الاتي :

- الولادة لأم مصابة.
- ممارسة الجنس مع شريك مصاب.
- نقل الدم الملوث أو منتجاته الملوثة.
- مشاركة الإبر والمحاقن أو معدات تحضير الأدوية عند استخدام أدوية الحقن.
- ملامسة دم الشخص المصاب أو سوائل جسمه.
- التعرض لوخز الإبر الملوثة أو إصابات الأدوات الحادة الملوثة .
- مشاركة بعض العناصر مع شخص مصاب يمكن أن تكسر الجلد أو الأغشية المخاطية (مثل شفرات الحلاقة وفرشاة الأسنان وأجهزة مراقبة الجلوكوز) ، مما قد يؤدي إلى التعرض للدم.

الاشخاص المعرضون لخطر عدوى الإصابة بفيروس التهاب الكبد B

- متعاطي المخدرات بالحقن.
- التعرض الجنسي.

- الملامسين في المنزل ، مثل (افراد العائلة للشخص المصاب) .
- الأشخاص ذوو الإعاقة التنموية مثل (ذوي الاحتياجات الخاصة) في مرافق الرعاية طويلة الأمد .
- المؤسسات الإصلاحية مثل (السجون).
- الأشخاص المعرضون لخطر التعرض المهني لفيروس التهاب الكبد B مثل (العاملين في المؤسسات الصحية).
- مرضى غسيل الكلى.
- الأشخاص المصابون بفيروس التهاب الكبد C.
- الأشخاص المصابون بأمراض الكبد المزمنة.
- المسافرون إلى البلدان التي يتوطن فيها التهاب الكبد B.
- الأشخاص المصابون بفيروس نقص المناعة البشرية.
- مرضى السكر.

التعرض المهني للعاملين في مجال الرعاية الصحية لفيروس التهاب الكبد B

العاملون في مجال الرعاية الصحية هم أشخاص تتطلب وظيفتهم الاتصال بالمرضى أو سوائلهم الجسدية. الممرضون ، والأطباء ، والصيادلة ، والفنيون ، وأطباء الأسنان ، والطلاب ، ومهنيو السلامة العامة ، والعاملين في مجال الاستجابة للطوارئ ، والعاملين في نفايات الرعاية الصحية ، ومقدمي الإسعافات الأولية ، والمتطوعين هم من بين أولئك الذين يعملون في هذا المجال.

يعد الاتصال المباشر بالمواد المعدية ، وخاصة الدم أو سوائل الجسم المصابة بفيروس التهاب الكبد B ، هو أكبر عامل خطر للإصابة بفيروس التهاب الكبد B في العاملين في مجال الرعاية الصحية. يمكن أيضًا التعرف على HBsAg ، الذي يكون عادةً علامة على الإصابة بفيروس التهاب الكبد B ، في سوائل الجسم الأخرى . نظرًا لأن معظم سوائل الجسم تحتوي على كميات ضئيلة من فيروس التهاب الكبد B المعدي ، فهي مركبات نقل غير فعالة (إلا إذا كانت تحتوي على دم). ما لم يحتوي البلغم أو البول أو القيء على دم ، فلا يُحتمل أن تكون معدية.

الإصابة عن طريق الجلد (على سبيل المثال ، الوخز بالإبر أو جرح بجهاز طبي حاد مستخدم سابقًا) أو تلامس بين غشاء مخاطي أو جلد غير سليم (على سبيل المثال ، جلد مكشوف متشقق أو متآكل أو مصاب بالتهاب الجلد) مع الدم او الأنسجة أو سوائل الجسم الأخرى يمكن أن تعرض الـ عامل الرعاية الصحية لخطر الاصابة بالتهاب الكبد الفيروسي B او C او فيروس نقص المناعة المكتسبة .

يحتوي دم مرضى التهاب الكبد B على أعلى مستوى من الفيروس وهو المصدر الأكثر شيوعًا للانتقال في المستشفى . تشمل السوائل المعدية المحتملة السائل الدماغي الشوكي والسائل الزلالي للمفصل والسائل الجنبي والسائل البريتوني والسائل التاموري والسائل الأمنيوسي .

تم تحديد التهاب الكبد B على أنه خطر مهني على العاملين في مجال الرعاية الصحية لأن الفيروس قد يعيش لفترات طويلة من الوقت على الأسطح ويمكن أن ينتقل حتى في حالة عدم وجود دم مرئي. على عكس احتمالية انتقال فيروس نقص المناعة البشرية وفيروس التهاب الكبد C بعد التعرض عن طريق الجلد (٠,٣٪ و ١,٨٪ على التوالي) ، فإن خطر انتقال فيروس التهاب الكبد B عادة ما يتراوح من(٦- ٣٠٪) .

العلاقة بين التهاب الكبد الفيروسي D و التهاب الكبد الفيروسي B

فيروس التهاب الكبد D (HDV)، المعروف باسم (دلتا فيروس) هو أحد الفيروسات التي يحتوي على الحمض النووي الريبي (RNA) مع وجود خلل يمنعه من البقاء على قيد الحياة بمفرده. فقط الأشخاص المصابون بفيروس التهاب الكبد B معرضون لخطر الإصابة بـ HDV لأن الفيروس يحتاج الى المستضد السطحي لفيروس التهاب الكبد B (HBsAg) ليتكاثر .

يمكن أن يصاب الأشخاص بفيروس التهاب الكبد B و D في نفس الوقت وتعرف العدوى باسم (العدوى المشتركة) ، أو يمكن أن يصابوا بفيروس التهاب الكبد D بعد الإصابة بفيروس التهاب الكبد B وتعرف العدوى باسم (العدوى الفائقة) . يمكن أن تؤدي العدوى بفيروس التهاب الكبد B و D إلى التهاب الكبد الخاطف وتكون العدوى أكثر خطورة من عدوى فيروس التهاب الكبد B وحدها. التهاب الكبد D لا يمكن الوقاية منه عن طريق التطعيم. من ناحية أخرى ، يحمي التطعيم ضد التهاب الكبد الفيروسي B من الإصابة بفيروس التهاب الكبد D في المستقبل .

ينتقل التهاب الكبد D مثل التهاب الكبد B ، عبر الجلد و يعتبر شائعًا لدى أولئك الذين يستخدمون الأدوية الوريدية أو الحقن ، ومرضى غسيل الكلى ، والأشخاص الذين يخضعون لعمليات نقل دم متعددة. قد تستمر فترة الحضانة من ٣٠ إلى ١٥٠ يومًا .

يزيد التهاب الكبد D من فرص إصابة المريض بالتهاب الكبد المزمن والموت في النهاية بسبب الفشل الكبدي. تتطابق أعراض HDV مع أعراض التهاب الكبد B ، باستثناء أن الأفراد أكثر عرضة للإصابة بالفشل الكبدي الخاطف والتهاب الكبد المزمن النشط وتليف الكبد. العلاج هو نفسه لأنواع أخرى من التهاب الكبد.

تشخيص الإصابة بفيروس التهاب الكبد B

نظرًا لأنه من المستحيل التمييز بين التهاب الكبد B والتهاب الكبد الناجم عن عوامل فيروسية أخرى بناءً على الاعراض السريرية ، فإن التأكيد المختبري للتشخيص مطلوب. يمكن تشخيص فيروس التهاب الكبد B ومراقبته باستخدام مجموعة متنوعة من اختبارات الدم. يمكن استخدامها لمعرفة الفرق بين الالتهابات الحادة والمزمنة.

يلزم إجراء ثلاثة اختبارات مصلية مختلفة (المستضد السطحي لفيروس التهاب الكبد B (HBsAg ، و(الأجسام المضادة للمستضد السطحي لفيروس التهاب الكبد B (anti-HBs))، و(الأجسام المضادة للمستضد الأساسي لفيروس التهاب الكبد B (anti-HBc) ، لتحديد ما إذا كان المريض:

١- مصاب بعدوى حادة أو مزمنة بفيروس التهاب الكبد B ، ويتطلب استشارة ما بعد الاختبار والربط بالرعاية الصحية .
٢- محصن ضد التهاب الكبد B نتيجة لعدوى سابقة أو تلقيح (بالتزامن مع تاريخ التطعيم) .
٣- عرضة للعدوى ويتطلب التطعيم.

يركز التشخيص المختبري لعدوى فيروس التهاب الكبد B على الكشف عن المستضد السطحي (HBsAg) لهذه العدوى. لأن HBsAg هو علامة مؤكدة لعدوى فيروس التهاب الكبد B.

يتم اكتشاف HBsAg في دم الشخص المصاب بمتوسط ٤ أسابيع (المدى: من ١ إلى ٩ أسابيع) بعد التعرض للفيروس . وجميع المرضى الذين لا يظلون مصابين بالعدوى المزمنة سيكون فحص الـ (HBsAg) سلبياً بعد ١٥ أسبوعًا من ظهور الأعراض .

علاج التهاب الكبد الفيروسي B

لا يوجد علاج محدد لفيروس التهاب الكبد B الحاد. نتيجة لذلك ، يركز العلاج على ضمان الراحة والتوازن الغذائي الصحي ، وكذلك تعويض السوائل المفقودة بسبب القيء والإسهال. أهم شيء هو الابتعاد عن الأدوية التي لا داعي لها. يجب تجنب كل من الأسيتامينوفين والباراسيتامول والأدوية المضادة للقيء.

يمكن استخدام الأدوية ، وخاصة الأدوية المضادة للفيروسات عن طريق الفم ، لعلاج العدوى المزمنة بفيروس التهاب الكبد B. الهدف من العلاج هو تقليل الحمل الفيروسي وإنزيمات الكبد مع تقليل تطور المرض ومضاعفاته أيضًا. أنظمة العلاج الحالية لفيروس التهاب الكبد B تثبط الفيروس ولكنها لا تقضي عليه. الأدوية الأكثر فعالية لتثبيط التهاب الكبد B ، وفقًا لمنظمة الصحة العالمية ، هي العلاجات الفموية التينوفير (Tenofovir) أوالانتكافير(Entecavir) . يجب على غالبية المرضى الذين يبدؤون العلاج من فيروس التهاب الكبد B استخدامه لبقية حياتهم. في الدول ذات الدخل المرتفع ، تتم زراعة الكبد أحيانًا في الأشخاص المصابين بتليف الكبد أو سرطان الكبد بدرجات مختلفة من النجاح.

المحاضرة الثالثة

الوقاية من عدوى التهاب الكبد B

التحصين ضد الالتهاب الكبد B

في الواقع ، يعتبر التحصين العالمي أكثر الأساليب فعالية من حيث التكلفة لمكافحة عدوى فيروس التهاب الكبد B.والدعامة الأساسية لجهود الوقاية من التهاب الكبد B هو لقاح التهاب الكبد B . حددت منظمة الصحة العالمية (WHO) هدفًا يتمثل في دمج التطعيم ضد التهاب الكبد B في برامج التمنيع الوطنية ، وإعطاء جميع الأطفال حديثي الولادة جرعة عند الولادة خلال ٢٤ ساعة من الولادة ، عند الرضع الذين يولدون لأمهات مصابات وفي بعض السيناريوهات الوقائية الأخرى بعد التعرض ، يستخدم المصل (الكلوبيولين المناعي لالتهاب الكبدB (HBIG) بشكل شائع كعامل مساعد للقاح لالتهاب الكبد B. يمكن أن يساعد HBIG في تكملة الحماية حتى يتم تحقيق استجابة اللقاح. بعد التعرض لفيروس التهاب الكبد B ، يعد HBIG وحده المصدر الأساسي للحماية للأشخاص الذين لا يستجيبون للقاح التهاب الكبد B.

أ. التحصين النشط (Active Immunization) : التطعيم (اللقاح)

الهدف من التحصين النشط لفيروس التهاب الكبد B هو تفعيل مناعة الانسان . في عام ١٩٨٦ تم إنشاء لقاح HBV عالي النقاء باستخدام تقنية الهندسة الوراثية . حاليًا ، يتم إنتاج جميع اللقاحات التي تحتوي على المستضد السطحي للفيروس (HBsAg) في خلايا خميرة هانسنولا بوليموريفا

(Hansenula polymorpha) أو خميرة بيتشيا باستوريس (Pichia pastoris) أو خلايا الثدييات (مبيض الهامستر الصيني).

التطعيم ضد التهاب الكبد B آمن ومنتشر حول العالم. فرط الحساسية للخميرة أو أي من مكونات اللقاح هي موانع مطلقة للتطعيم ضد التهاب الكبد B . لن يكون للتطعيم أي تأثير على الأشخاص المصابين بالفعل بفيروس التهاب الكبد B ، تطعيم شخص مصاب بالفعل خالي تمامًا من المخاطر. يمكن إعطاء لقاح التهاب الكبد B للنساء الحوامل والمرضعات بأمان. يجب تطعيم جميع موظفي الرعاية الصحية المعرضين مهنياً وغيرهم ضد فيروس التهاب الكبد B .

عادة ما تظهر الأجسام المضادة (anti-HBs) كمقاومة لعدوى التهاب الكبد B. يُطلق على الأطفال والبالغين المؤهلين مناعياً والذين لديهم مستويات اجسام مضادة بفعل التطعيم تصل إلى اكثر او يساوي (≤١٠ ملي وحدة دولية / مل) من ١-٢ شهر بعد تلقي سلسلة لقاح التهاب الكبد B كاملة ، هم مستجيبون للقاح . تنخفض مستويات الأجسام المضادة (anti-HBs) بمرور الوقت بعد التطعيم.

جدول اللقاحات ضد التهاب الكبد B

يتم إعطاء لقاح التهاب الكبد B للأشخاص الأصحاء على ثلاث جرعات : الجرعة الأساسية (الجرعة الصفرية) ، الجرعة الثانية بعد(شهر واحد) ، والجرعة الثالثة بعد (ستة أشهر). في الأشخاص الذين يبدو أنهم يتمتعون بصحة جيدة ، قد لا تكون الجرعة المنشطة ضرورية.

الأشخاص الذين يحتاجون للتطعيم ضد التهاب الكبد B

- يجب أن يتلقى جميع الأطفال حديثي الولادة لقاح التهاب الكبد B.
- جميع الأطفال والمراهقين غير الملقحين الذين تقل أعمارهم عن ١٩ عامًا.
- المرضى الذين يحتاجون بانتظام إلى الدم أو مشتقاته.
- مرضى غسيل الكلى.
- مرضى السكر.
- متلقي زراعة الأعضاء الصلبة.
- المصابين بأمراض الكبد المزمنة.
- الأشخاص المصابون بفيروس التهاب الكبد C.
- الأشخاص المصابون بفيروس نقص المناعة البشرية.
- الأشخاص في المؤسسات الإصلاحية مثل (السجناء).
- متعاطو المخدرات عن طريق الحقن.
- الأشخاص الذين يتصلون في المنزل بشخص مصاب بفيروس التهاب الكبد B.
- العاملون في مجال الرعاية الصحية الذين قد يتعرضون للدم أو مشتقاته أو غيرها من المواد التي يحتمل أن تكون ضارة أثناء عملهم مع سوائل الجسم التي يحتمل أن تكون معدية.
- الأشخاص المعرضون لخطر العدوى بسبب الاتصال الجنسي مع شريك جنس مصاب.
- المسافرون الدوليون إلى البلدان ذات المستويات المرتفعة أو المتوسطة من العدوى المستوطنة بفيروس التهاب الكبد B (نسبة الانتشار≥ ٢٪).
- أي شخص آخر يسعى للحماية من الإصابة بعدوى فيروس التهاب الكبد B.

ب -التحصين السلبي (passive immunization): الكلوبيولين المناعي لالتهاب الكبد B (HBIG)

يمكن أن يوفر التحصين السلبي بحقن الاجسام المضادة حماية قصيرة الأمد ضد أمراض معينة. الميزة الرئيسية لاستخدام هذه التقنية لتجنب العدوى هي أن الحماية تكون فورية.

بالنسبة للوقاية بعد التعرض ، عادةً ما يتم دمج الكلوبيولين المناعي لالتهاب الكبد B (HBIG) مع لقاح التهاب الكبد B. يُعد HBIG بمفرده هو الطريق الأساسي للحماية بعد التعرض لفيروس التهاب الكبد B للأشخاص الذين لا يستجيبون للتطعيم HBV. يعد الكلوبيولين المناعي لالتهاب الكبدB بمفرده هو الوسيلة الأساسية الوحيدة للحماية بعد التعرض لفيروس التهاب الكبد B للأشخاص الذين لا يستجيبون للقاح التهاب الكبد B .

يمكن إعطاء لقاح التهاب الكبد B و الكلوبيولين المناعي لالتهاب الكبدB في نفس الوقت ، ولكن في موقع حقن مختلف (على سبيل المثال ، طرف منفصل) . لقاح التهاب الكبد B والكلوبيولين المناعي يجب أن تعطى في أقرب وقت ممكن بعد التعرض عندما يتطلب الامر . من غير المعروف مدى فعالية و الكلوبيولين المناعي لالتهاب الكبدB عند إعطائه بعد ٧ أيام من التعرض . يتم توفير اجسام مضادة السلبية بواسطة الكلوبيولين المناعي لالتهاب الكبدB ، مع توفير حماية مؤقتة (تدوم من ٣ إلى ٦ أشهر). يُعطى الكلوبيولين المناعي لالتهاب الكبدB خلال أسبوع واحد من التعرض ، ويوفر حماية بنسبة ٧٥٪ ضد الإصابة بفيروس التهاب الكبد B.

حماية العاملين في مجال الرعاية الصحية من فيروس التهاب الكبد B

فيروس التهاب الكبد B شديد العدوى وينتشر بشكل كبير عن طريق الجلد أو الغشاء المخاطي الملامسة للدم أو سوائل الجسم المعدية ، مما يزيد من خطر الإصابة بالعدوى لعاملي الرعاية الصحية الذين يتعاملون مع المرضى والمواد الناتجة من المريض بشكل منتظم.

في جميع أماكن الرعاية الصحية ، يعد منع انتقال الأمراض المعدية بين العاملين في مجال الرعاية الصحية والمرضى عنصرًا حيويًا في تقديم الرعاية الصحية الآمنة. توفر الصحة والسلامة المهنية المعرفة بمكافحة العدوى المهنية والخدمات المقدمة إلى العاملين في مجال الرعاية الصحية ، بما في ذلك تحصين العاملين في مجال الرعاية الصحية ومراقبة التعرض للعدوى والأمراض المعدية من المرضى الى العاملين في الرعاية الصحية او بالعكس او انتقال العدوى الى الاخرين .

المحاضرة الرابعة

تدابير ما قبل التعرض

التعليم والتدريب

تهدف برامج التدريب والتعليم للوقاية من العدوى المهنية ومكافحتها إلى:

- تحسين معرفة العاملين في مجال الرعاية الصحية ، وكفاءتهم ، ومهاراتهم العملية في الوقاية من الأمراض المعدية.

- يمكن أن يضمن التعليم والتدريب تزويد العاملين في مجال الرعاية الصحية بإجراءات الصحة والسلامة المهنية والتعرف عليها.
- تشجيع على التعرف الفوري على حالات التعرض والأمراض المعدية والإبلاغ عنها وتقييمها وإدارتها .
- تقليل التعرض والعدوى بين العاملين في مجال الرعاية الصحية.
- تسهيل مكافحة تفشي الأمراض المعدية .
- لزيادة التعرف على حالات التعرض للدم وسوائل الجسم وتشجيع الإبلاغ المبكر عنها ، يجب أن يكون العاملون في مجال الرعاية الصحية مدربين جيدًا فيما يتعلق بالحقن الآمن والوقاية بعد التعرض في وقت التوظيف.

تطعيم العاملين في مجال الرعاية الصحية

التطعيم الوقائي هو الطريقة التداخلية الرئيسية لتجنب الإصابة بفيروس التهاب الكبد B . يفرض معيار مسببات الأمراض المنقولة بالدم الصادر عن إدارة السلامة والصحة المهنية (OSHA) أن يتم تقديم لقاح التهاب الكبد B دون تكلفة على صاحب العمل ، وأن يكون اللقاح متاحًا لتدابير ما بعد التعرض. يجب على أرباب العمل إخبار الموظفين عن فعالية اللقاح وسلامته وطريقة إعطائه وفوائد التطعيم ، وفقًا للمبدأ التوجيهي. يجب على الموظفين الذين يرفضون التطعيم التوقيع على نموذج رفض يتبع إرشادات إدارة السلامة والصحة المهنية.

الاختبارات المصلية قبل وبعد التطعيم للعاملين في مجال الرعاية الصحية

قد تقلل الاختبارات المصلية من عدد الأشخاص الذين يتلقون لقاحات غير ضرورية عندما تكون المختبرات متوفرة ويعتبر اختبار ما قبل التطعيم فعالاً من حيث التكلفة للناس الذين لديهم بالفعل مناعة ضد فيروس التهاب الكبد B .

لا ينبغي أن تكون الاختبارات المصلية عائقاً أمام تحصين الأشخاص المعرضين للخطر ، لا سيما في المناطق التي يصعب الوصول إليها. الاختبار ليس مطلوبًا للتحصين ، وعندما لا يكون الاختبار ممكنًا ، يجب الاستمرار في التطعيم. الاختبارات المصلية للمناعة ليست ضرورية بعد التطعيم الروتيني للرضع أو الأطفال أو البالغين . يوصى بالاختبار ما بعد التطعيم ، للفئات التالية :

- الأشخاص المعرضون لخطر الإصابة بفيروس التهاب الكبد B في العمل ، مثل العاملين في مجال الرعاية الصحية .
- الرضع المولودين لأمهات مصابات بفيروس التهاب الكبد B.
- مرضى غسيل الكلى المزمن.
- الأشخاص المصابون بفيروس نقص المناعة البشرية وغيرهم من الأشخاص الذين يعانون من نقص المناعة.
- شركاء الجنس أو شركاء تقاسم الإبر للأفراد المصابون بفيروس التهاب الكبد B.
- الأشخاص الآخرون الذين يعانون من نقص المناعة (على سبيل المثال ، متلقي زرع الخلايا الجذعية المكونة للدم أو الأشخاص الذين يتلقون العلاج الكيميائي)

يجب الكشف عن التركيزات الواقية للأجسام المضادة باستخدام نهج كمي (على سبيل المثال ، فحص الـ (إلايزا) (ELISA)) . يعتبر مستوى الأجسام المضادة البالغة (≤١٠ ميكرو وحدة دولية

/ مل) كافية للوقاية ؛ يجب أن يحصل العاملون في مجال الرعاية الصحية الذين لديهم مستويات الاجسام المضادة أقل من ١٠ ميكرو وحدة دولية / مل على جرعات أخرى من اللقاح (يبلغ إجمالي الجرعات ٦ جرعات) ، يليها اختبار الاجسام المضادة بعد شهر إلى شهرين من آخر جرعة.

الاحتياطات القياسية لمكافحة العدوى

الاحتياطات القياسية (SPs) هي مجموعة من تقنيات مكافحة العدوى المستخدمة لتجنب انتقال المرض عن طريق سوائل الجسم والدم والجلد المصاب (بما في ذلك الطفح الجلدي) والأغشية المخاطية. يجب اتخاذ هذه الاحتياطات عند رعاية أي شخص ، بغض النظر عما إذا كانت معدية مع اعراض أو لا . يجب على العاملين في مجال الرعاية الصحية الالتزام الصارم بسياسات مكافحة العدوى بناءً على الاحتياطات العامة ،لانهم سوف يتعرضون بكثرة لالتهاب الكبد B وغيره من الفيروسات المنقولة بالدم إذا لم يتبعوا المعايير والاحتياطات القياسية التي تنظم الدم وسوائل الجسم الأخرى . انظر الجدول رقم (١)

غسل اليدين : يجب تنظيف اليدين في "الخمس لحظات من نظافة اليدين"

- قبل لمس المريض.
- قبل إجراء تقنية نظيفة / معقمة.
- بعد التعرض للدم أو سوائل الجسم .
- بعد ملامسة المريض.
- بعد لمس محيط المريض.

بالنسبة لمعظم أنشطة الرعاية السريرية ، يكفي غسل اليدين بالماء والصابون السائل العادي ؛ تعتبر التقنية المستخدمة في تنظيف اليدين أهم من نوع الصابون المستخدم. من الضروري أيضًا غسل اليدين تحت الماء الجاري بدلاً من الماء الراكد.

الإجراء	الاستخدام
العزل	غير مطلوب
غسل اليدين	مطلوب
الكفوف	مطلوب عندما يكون ملامسة الدم او سوائل الجسم ممكنا
المريلة والعباءة (الكاون)	مطلوب عندما يكون ملامسة الدم او سوائل الجسم ممكنا
القناع (الماسك)	مطلوب عندما يكون تناثر سوائل الجسم ممكنا
حماية العين	مطلوب عندما يكون تناثر سوائل الجسم ممكنا
تطهير الدم / سوائل الجسم المنسكبة	المواد التي تحرر الكلور بتركيز ١٠٠٠٠ جزء في المليون من الكلور المتاح يجب أن تستخدم لتطهير الدم / سوائل الجسم المنسكبة او المتناثرة.
إدارة المخلفات	التعامل مع النفايات على أنها "نفايات طبية" وتخلص منها عبر ممر النفايات السريرية .
البياضات والغسيل	العناصر الملوثة بالدم / سوائل الجسم يجب أن يعامل على أنه "بياضات معدية" .

جدول رقم (١) الاحتياطات الخاصة بمكافحة عدوى التهاب الكبد B

الكفوف : تخدم غرضين ، فهي تحمي عاملو الرعاية الصحية وتمنع انتقال الكائنات الحية الدقيقة إلى المرضى أثناء الإجراءات التداخلية. ويجب اتباع الاتي:

- يجب ارتداء القفازات (عند توقع / احتمال التعرض للدم و / أو سوائل الجسم الأخرى ،
- تغييرها فورًا بعد كل مريض و / أو بعد الانتهاء من العلاج أو المهمة ، و تغييرها إذا تم اكتشاف ثقب أو تمزق .
- ويجب ان تكون مناسبة للاستخدام ، ومناسبة للغرض تماما.
- يجب ارتداء زوجين من القفازات(القفازات المزدوجة) أثناء الإجراءات المعرضة بدرجة أكبر للتعرض لخطر العدوى.
- يجب عدم استخدام القفازات المستخدمة في عملية أو نشاط للتعامل أو الكتابة على المخططات أو أي أسطح مشتركة ونظيفة أخرى.
- لا ينبغي أبدًا غسل القفازات أو معالجتها بفرك اليدين بالكحول.
- ارتداء القفازات لا يلغي الحاجة إلى غسل اليدين ؛ يجب تنظيف اليدين قبل وبعد ارتداء القفازات.
- تحت القفازات ، يجب عدم ارتداء أي مجوهرات. عادة ما تكون الأشرطة المعدنية العادية مقبولة ، لكن الحلقات المحجورة (الخواتم التي تحتوي على احجار) يمكن أن تمزق مادة القفاز ويجب عدم استخدامها أثناء الممارسة السريرية .

المريلة والعباءة (الكاون) : أثناء العمليات وأنشطة رعاية المرضى التي من المحتمل أن تسبب بقعًا أو رذاذًا من الدم أو سوائل الجسم أو الإفرازات ، فإن العباءة (الكاون) / المريلة المقاومة للسوائل تحمي الملابس والجلد من التلوث بالعوامل المعدية . بالنسبة للعلاجات التي يُتوقع أن ينتج عنها تناثر أو رش للدم أو مواد جسدية ، يكفي ارتداء عباءة نظيفة غير معقمة. يجب ارتداء المريلة أو العباءات عند الحاجة ، وعدم ارتداؤها بشكل روتيني كجزء من الأنشطة العادية . إنها منتجات للاستخدام لمرة واحدة يتم التخلي عنها والتخلص منها كنفايات سريرية بعد إجراء او جلسة واحدة من رعاية المريض . بعد الانتهاء من المهمة التي تم ارتداؤها من أجلها ، يجب خلع المريلة أو العباءة (الكاون) قبل لمس الأماكن أو البضائع أو الأسطح البيئية غير الملوثة والنظيفة أو التفاعل مع المرضى والموظفين الآخرين .

أقنعة الوجه (الماسك) ،ودرع الوجه والنظارات(حماية العينين) : عندما يحتمل أن يتناثر الدم أو سوائل الجسم أو المواد في العينين أو الوجه أو الفم ، يجب ارتداء أقنعة الوجه والأقنعة الواقية للعينين. ارتداء القناع (الماسك) يمنع الرذاذ من الدخول إلى الفم أو الانف. يجب عدم ارتداء الأقنعة الممزقة أو المكسورة لأنها قد لا توفر الحماية الكافية. الأقنعة الجراحية عبارة عن منتجات تستخدم مرة واحدة ، ويجب التخلص منها بعد الاستخدام. لا ينبغي ارتداؤها على الرقبة ويجب تغييرها بمجرد أن تصبح رطبة أو مبللة أو ملوثة. يجب عدم إعادة استخدامها بعد إزالتها ويجب على مرتديها ان ينظف اليدين بعد إزالة القناع(الماسك) المستخدم .

لضمان حماية الأجزاء الجانبية ، يجب أن تلتف الأقنعة / النظارات الواقية حول منطقة العين. عندما يكون هناك خطر كبير لتناثر أو رش الدم أو سوائل الجسم الأخرى ، يمكن استخدام درع الوجه بدلاً من مجموعة القناع(الماسك) والنظارات الواقية. ثناء إجراءات توليد الهباء الجوي (التنبيب ، الشفط الفموي / البلعوم الأنفي ، العناية بفغر القصبة الهوائية ، العلاج الطبيعي للصدر ، تنظير القصبات / الإنعاش القلبي الرئوي) ، يجب ارتداء الأقنعة / النظارات الواقية. يجب أن يرتديها جميع العاملين في غرفة العمليات الذين يشاركون بشكل مباشر في إجراء جراحي مع خطر تناثر السوائل.

البياضات والغسيل: لمنع انتشار الكائنات الدقيقة ، يجب التعامل مع كل بياضات بحذر. في حين أن هناك احتمال تلوث الزي الموحد / الملابس ، مثل عند تعديل وتغيير الفراش ، يجب استخدام مريلة او عباءة (كاون) بلاستيكية يمكن التخلص منها. يجب معاملة البياضات والغسيل الملوث بالدم وسوائل الجسم على أنه "بياضات معدية". البياضات المستخدمة مع مريض معروف أو يشتبه في إصابته بعدوى ، أو ملوث بالدم أو سوائل الجسم الأخرى ، يجب أن توضع في أكياس خاصة وأن توضع عليها بطاقة تعريفية على انها مواد ملوثة. قبل إرسال البياضات لغسلها ، يجب على العاملين في مجال الرعاية الصحية التأكد من خلوها من المواد الغريبة مثل الأدوات الحادة والأدوات ، ووضع البياضات المستهلكة في أكياس مانعة للتسرب .

تطهير الدم \ سوائل الجسم المنسكبة : عند تطهير الدم او سوائل الجسم المنسكبة يجب استخدام المواد الكيميائية المطلقة للكلور بتركيز ١٠٠٠٠ جزء في المليون (جزء في المليون) من الكلور. وللتخلص من النفايات يجب التعامل مع النفايات على أنها "نفايات طبية" والتخلص منها من خلال مجرى النفايات السريرية.

التخلص من الإبر والأدوات الحادة الأخرى : عند استخدام الإبر والأشياء أو الأجهزة الحادة الأخرى ، يكون خطر انتقال فيروس التهاب الكبد B أكبر. عند تنظيف الأدوات الحادة القابلة لإعادة الاستخدام والتخلص من الأدوات الحادة ، يجب توخي المزيد من الحذر لتجنب الحوادث. يتم التعامل مع الأدوات الحادة والتخلص منها بأمان من قبل جميع العاملين في مجال الرعاية الصحية الذين يستخدمونها في (حاويات الأدوات الحادة).

يجب إحضار جميع الأشياء الحادة للمريض على صينية أو عربة ، تزويد العربة بوعاء الأدوات الحادة (إلى نقطة الرعاية). بعد استخدام الأدوات الحادة ، يجب التخلص منها على الفور في حاوية الأدوات الحادة. يجب عدم الفصل بين الإبر والمحاقن ؛والتخلص منها معًا. لا ينصح بإعادة تغليف الإبر. إذا لزم الأمر ،يجب استخدام جهاز إعادة تغليف أو ضع الغطاء على سطح مستو ودفع الإبرة فيه . لا ينبغي تسليم الأدوات الحادة بين العاملين في مجال الرعاية الصحية باليد ؛ بدلاً من ذلك ، يجب نقلها باستخدام صينية مقاومة للثقب أو طبق الكلى. بعد استخدام الإبر أو الواخزات أو الأدوات الحادة الأخرى ، لا تثنيها. لا ينبغي أبدًا وضع الأدوات الحادة في حاوية الأدوات الحادة بالقوة. يجباستخدام جهاز إزالة الشفرة أو الشق الموجود على غطاء حاوية الأدوات الحادة لإزالة شفرات المبضع [تتضمن بعض حاويات الأدوات الحادة شقوقًا على الغطاء - الشق الأملس لإزالة الشفرة بدون استخدام اليدين ، بينما الشق المتدرج لإزالة الإبرة بدون استخدام اليدين].

التخلص من النفايات : التخلص من النفايات يجب التعامل مع النفايات على أنها "نفايات طبية" والتخلص منها من خلال مجرى النفايات السريرية.

المحاضرة الخامسة

الوقاية بعد التعرض

يتعرض العاملون في مجال الرعاية الصحية لخطر كبير للإصابة بعدوى فيروس التهاب الكبد B بسبب ملامستهم للدم وسوائل الجسم المصابة. هذه العدوى خطيرة ، ولكن يمكن تجنبها ، خاصة في أماكن الرعاية الصحية ، باستخدام العلاج الوقائي بعد التعرض بشكل مناسب وسريع.

الإدارة الأولية ما بعد التعرض

للحصول على افضل نتيجة ممكنة ، يجب بدء الاجراءات الوقائية بعد التعرض في غضون ساعة بعد الإصابة يجب معالجة جميع حالات التعرض المهني بالري الفوري والغسيل بالماء والصابون. على الرغم من عدم بطلان استخدام المطهرات ، إلا أنه لا توجد بيانات كافية لإثبات أن محاليل الكلورهيكسيدين أو اليود للعناية بالجروح تقلل من خطر انتقال العدوى عن طريق الدم. إذا دخل الدم أو سوائل الجسم الأخرى إلى الفم ، يتم بصقه ويشطف الفم بالماء عدة مرات. يتم إزالة أي ملابس ملوثة والاستحمام. إذا تعرضت العينان أو تلوثتا ، اشطفهما برفق بمحلول ملحي عادي أو ماء لمدة ٣٠ ثانية على الأقل بينما تظلان مفتوحتين (أزل العدسات اللاصقة). اغسل الجروح ومواقع الجلد التي لامست الدم أو سوائل الجسم بالماء والصابون ، واغسل الأغشية المخاطية بالماء.

يجب نصح جميع مقدمي الرعاية الصحية ، حتى أولئك الذين قاموا بتثبيت الحماية من التهاب الكبد B (الملقحين)، بالإبلاغ عن أي تعرض للدم أو سوائل الجسم في أسرع وقت ممكن، للصحة المهنية بغرض تحديد أفضل مسار للعمل لمنع انتشار مسببات الأمراض المنقولة بالدم (مثل فيروس نقص المناعة البشرية ، وفيروس التهاب الكبد C ، وفيروس التهاب الكبد B). يجب على عامل الرعاية الصحية إخطار المشرف أو المدير في أقرب وقت ممكن خلال٢٤ ساعة. يجب على المشرف الترتيب لإجراء تقييم طبي سريع لعامل الرعاية الصحية والمريض الذي تسبب في التعرض خلال٢٤ ساعة املأ تقرير العرض .

اسم الموظف المعني ، وموقع الحادث ، مثل الجناح أو غرفة العمليات أو غرفة الطوارئ. وصف الحادث. ويجب أن يُدرج اسم مصدر العدوى (مثل المريض) الذي شاركت دمه أو مواد جسمه في الحادث في تقرير التعرض. إذا كان مصدر الدم غير مؤكد ، فيجب تدوينه أيضًا.

عندما تكون هوية المريض المصدر غير واضحة (كما هو الحال في ثقب الإبرة في القمامة) ، يجب معاملة عامل الرعاية الصحية المكشوف كما لو كان المريض المصدر إيجابي (مصاب بالتهاب الكبد B).

سواء كان المريض المصدر معروفًا أم غير معروف ، لا يُقترح اختبار الإبر والأجهزة الحادة الأخرى المسببة في التعرض. في مثل هذه الظروف ، تكون موثوقية البيانات وتفسيرها غير معروفين ، وقد يكون الاختبار خطيرًا على أولئك الذين يتعاملون مع المعدات الحادة.

إذا تعذر تحديد حالة العدوى للمريض المصدر ، فيجب معاملة الفرد المتعرض كما لو كان المصدر مصابًا. يجب مراجعة نتائج اختبار (فيروس نقص المناعة البشرية ، وفيروس التهاب الكبد C ، وفيروس التهاب الكبد B) السابقة اذا كان ذلك متاحا.

إذا كان المصدر معروفًا ، فيجب التحقق من تواريخ التطعيمات ضد التهاب الكبد B ومستوى(the titer) الاجسام المضادة لالتهاب الكبد B بعد التحصين (anti-HBs). إذا تم تطعيم الشخص المصاب ولكن الاستجابة غير مؤكدة ، فيجب إجراء اختبار للأجسام المضادة لالتهاب الكبد B (anti-HBs).

يجب أن يكون لدى العاملين في مجال الرعاية الصحية إمكانية الوصول في الوقت المناسب إلى رعاية ما بعد التعرض والوقاية ، بما في ذلك اللقاح ضد التهاب الكبد B والحصول على المصل (الكلوبيولين المناعي لالتهاب الكبد B) من مؤسساتهم. يجب إعطاء لقاح ضد التهاب الكبد B والحصول على المصل (الكلوبيولين المناعي لالتهاب الكبد B) في أقرب وقت ممكن بعد التعرض للعاملين في مجال الرعاية الصحية الذين يعتبرون عرضة للإصابة بفيروس التهاب الكبد B.

يمكن إعطاء التهاب الكبد B و الكلوبيولين المناعي لالتهاب الكبد B في نفس الوقت في مواقع حقن مختلفة. بعد أن لم يعد من الممكن اكتشاف الاجسام المضادة لالتهاب الكبد B (anti-HBs) الناتجة من الكلوبيولين المناعي لالتهاب الكبد B (HBIG) (بعد ٦ أشهر) ، يجب إجراء اختبار مستوى الاجسام المضادة (anti-HBs) لعامل الرعاية الصحية الذي تلقى الكلوبيولين المناعي لالتهاب الكبدB (HBIG) . عندما يُعطى الكلوبيولين المناعي لالتهاب الكبدB (HBIG) بعد أكثر من ٧ أيام من التعرض عن طريق الجلد أو الغشاء المخاطي أو الجلد الغير سليم ، فان فاعليته تكون غير معروفة.

الوقاية بعد التعرض لعاملي الرعاية الصحية الملقحين

لا يعد اختبار المريض المصدر للكشف عن التهاب الكبد B ضروريًا لعاملي الرعاية الصحية الملقحين [الذين كتبوا توثيقًا لسلسلة كاملة من لقاح التهاب الكبد B] مع مستوى اجسام مضادة ≤١٠ ميكرو وحدة دولية / مل والتي تم التحقق منها لاحقا (بعد اكمال سلسلة اللقاح) ، وفي هذه الحالة بغض النظر عن اذا كان المصدر مصابا او لا ، لا يلزم استخدام العلاج الوقائي بعد التعرض لفيروس التهاب الكبد B.**(لاحظ الجدول رقم ٢)**

إذا كان مستوى الاجسام المضادة (anti-HBs) لدى عامل الرعاية الصحية أقل من ١٠ ميكرو وحدة دولية / مل وكان المريض المصدر إيجابيًا (مصابا) أو حالته غير مؤكدة ، فيجب أن يحصل عامل الرعاية الصحية على جرعة واحدة من الكلوبيولين المناعي لالتهاب الكبد B ويتم إعادة التلقيح في أقرب وقت ممكن بعد التعرض.

إذا كان مستوى الاجسام المضادة (anti-HBs) لدى عامل الرعاية الصحية أقل من ١٠ ميكرو وحدة دولية / مل وكان المريض المصدر سلبيًا لالتهاب الكبد B ، فيجب أن يحصل العاملون في الرعاية الصحية على جرعة لقاح أخرى ضد التهاب الكبد B ، يليها اختبار للأجسام المضادة (anti-HBs) بعد شهر إلى شهرين. بغض النظر عن حالة المريض المصدر مصابا او لا ، إذا كان عامل الرعاية الصحية يمتلك مستوى اجسام مضادة ≤١٠ ميكرو وحدة دولية / مل في وقت التعرض ، فلا يلزم توفير رعاية ما بعد التعرض لعامل الرعاية الصحية.

يجب اختبار المريض المصدر من أجل الكشف عن التهاب الكبد B في أقرب وقت ممكن بعد التعرض لعامل الرعاية الصحية المحصن (الذين كتبوا توثيقًا لسلسلة كاملة من لقاح التهاب الكبد B) مستوى اجسام مضادة اقل من ١٠ ميكرو وحدة دولية / مل بعد سلسلتين كاملتين من لقاح

التهاب الكبد B(٦ جرعات) ، إذا كان مصدر ايجابيا(مصاب) أو غير معروف ، يجب أن يتلقى عامل الرعاية الصحية جرعتين من الكلوبيولين المناعي لالتهاب الكبد B (HBIG) و يجب إعطاء الجرعة الأولى خلال ٢٤ ساعة من التعرض ؛ اما إذا لم يكن ذلك ممكنا على سبيل المثال (تأخر نتائج الفحص) ، فيجب بذل كل جهد لإعطائه في غضون سبعة أيام ، مع إعطاء الجرعة الثانية بعد شهر واحد . لا يُنصح بلقاح التهاب الكبد B للعاملين في الرعاية الصحية الذين تلقوا بالفعل سلسلتين من اللقاح و لا يلزم اعطاء اللقاح او اعطاء الكلوبيولين المناعي إذا كان المريض المصدر سلبيًا (غير مصاب) .

تدابير ما بعد التعرض لعاملي الرعاية الصحية الذين ليس لديهم توثيق للتطعيم ، أو لم يتم تطعيمهم أو لم يكملوا جرعات اللقاح

يجب تقييم المريض المصدر اذا كان مصابا اولا في أقرب وقت ممكن بعد التعرض عاملي الرعاية الصحية غير المحصنين أو المحصنين بشكل غير كامل (بما في ذلك أولئك الذين رفضوا التحصين).

يعد اختبار الاجسام المضادة لفيروس التهاب الكبد B (anti-HBs) لعاملي الرعاية الصحية غير المحصنين أو المحصنين جزئيًا أمرًا غير ضروري وربما يكون مضللًا ، لأن تحديد الاجسام المضادة لفيروس التهاب الكبد B (anti-HBs) بمستوى اجسام مضادة ≤١٠ ميكرو وحدة دولية / مل يعتبر ارتباطًا بالحماية التي يسببها اللقاح فقط لأولئك الذين أكملوا سلسلة التحصين المعتمدة. **(لاحظ الجدول رقم ٢).**

نظرًا لأن اختبار الاجسام المضادة لفيروس التهاب الكبد B (anti-HBs) لعاملي الرعاية الصحية الذين حصلوا على الكلوبيولين المناعي لالتهاب الكبد B (HBIG) يجب إجراؤه بعد أن لم يعد من الممكن اكتشاف الاجسام المضادة الناتجة من الكلوبيولين المناعي (بعد ٦ أشهر من الإعطاء) ، فيجب أن يتأخر اختبار الاجسام المضادة لفيروس التهاب الكبد B (anti-HBs) لأكثر من شهر إلى شهرين بعد جرعة اللقاح النهائية.

يجب إعادة التلقيح لعاملي الرعاية الصحية الذين يكون لديهم مستويات الاجسام المضادة لفيروس التهاب الكبد B (anti-HBs) أقل من ١٠ ميكرو وحدة دولية / مل بعد تلقي السلسلة الأولية، عادة ما يكون اختبار الاجسام المضادة لفيروس التهاب الكبد B (anti-HBs) بعد شهرين من الجرعة الثالثة من السلسلة الثانية الكاملة من ٣ جرعات وفقًا لجدول زمني ، أكثر واقعية بالنسبة إلى لعاملي الرعاية الصحية من الاختبارات المصلية بعد كل جرعة متتالية من اللقاح .

إذا كانت نتائج اختبار المريض المصدر سلبية (اي انه غير مصاب) ، فيجب على عاملي الرعاية الصحية مواصلة سلسلة لقاح HBV وفقًا للتوجيهات.

الوقاية بعد التعرض			اختبار ما بعد التعرض		
الفحص المصلي بعد التلقيح	التطعيم	HBIG	فحص الموظف (anti-HBs)	المريض مصدر العدوى(HBsAg)	حالة مقدم الرعاية الصحية
لا حاجة لأي اجراء					مستجيب موثق بعد سلسلة كاملة
لا حاجة	-	HBIG جرعتين منفصلتين بينهما شهر واحد	-*	إيجابي او غير معروف	غير مستجيب موثق بعد تلقي جرعتين من سلسلة اللقاح
			لا حاجة لأي اجراء	سلبي	
نعم	بدء إعادة التطعيم	HBIG جرعة واحدة	اقل من ١٠ ميلي وحدة دولية	إيجابي او غير معروف	الاستجابة غير معروفة بعد سلسلة كاملة من اللقاح
نعم	بدء إعادة التطعيم	لا حاجة	اقل من ١٠ ميلي وحدة دولية	سلبي	
		لا حاجة لأي اجراء	اكثر او يساوي ١٠ميلي وحدة دولية	مهما كانت النتيجة	
نعم	اكمال اللقاحات	HBIG جرعة واحدة	-	إيجابي او غير معروف	- غير محصن - محصن بشكل غير كامل - راقض اللقاح
نعم	اكمال اللقاحات	-	-	سلبي	
الاختصارات: anti- HBs = جسم مضاد لمستضد التهاب الكبد B السطحي ؛ HBIG = الكلوبيولين المناعي لالتهاب الكبد B ؛ HBsAg = مستضد سطح التهاب الكبد B . * لا حاجة اليه.					

الجدول رقم (٢)- الاجراءات اللاحقة للتعرض لعامل الرعاية الصحية بعد التعرض المهني(بالنسبة لالتهاب الكبد B) عن طريق الجلد أو الغشاء المخاطي للدم أو سوائل الجسم حسب الحالة المناعية لعامل الرعاية الصحية

اختبار عامل الرعاية الصحية الذي تعرض لمصدر مصاب (مريض مصاب) او مصدر مجهول

يجب أن يخضع العاملون في مجال الرعاية الصحية الذين يكون لديهم مستويات الاجسام المضادة لفيروس التهاب الكبد B (anti-HBs) أقل من ١٠ ميكرو وحدة دولية / مل ، أو الذين لم يتم تلقيحهم أو تم تطعيمهم بشكل غير كامل ، والذين تعرضوا عن طريق الجلد أو الغشاء المخاطي أو الجلد غير السليم لمريض مصدر إيجابي (مريض مصاب) أو لديه حالته غير معروفة ، اختبار أساسي(اولي) للكشف عن العدوى بفيروس التهاب الكبد B في أقرب وقت ممكن بعد التعرض ، واختبار المتابعة بعد حوالي ٦ أشهر.

يجب اختبار الاجسام المضادة للمستضد الاساسي لالتهاب الكبد B الكلي(total anti-HBc) فور التعرض لها ، ويجب اختبار المستضد السطحي لالتهاب الكبد B (HBsAg) اختبار الاجسام المضادة للمستضد الاساسي لالتهاب الكبد الفيروسي B الكلي (total anti-HBc) بعد ستة أشهر. خلال فترة المتابعة ، لا يحتاج العاملون في مجال الرعاية الصحية الذين تعرضوا لمريض مصدر مصاب أو حالته غير معروفة إلى اتخاذ أي رعاية إضافية لتجنب الانتقال الثانوي ؛ ومع ذلك ، يجب عليهم تجنب إعطاء الدم أو البلازما أو الأعضاء أو الأنسجة أو الحيوانات المنوية.

Appendix E
Questionnaire

Form's number ☐ **E1 /English Questionnaire**

Questionnaire on the knowledge and attitude of nursing staff towards the prevention of viral hepatitis

My brother& sister nurse .. Peace be upon you

Please take the time to read and answer each question carefully by ticking [✔] in front of the correct answer for your opinion. The results of this study will be useful in improving the knowledge and attitude of nurses towards hepatitis B virus and its prevention. The information you give will be treated with the utmost confidentiality. The name of the participant will not be mentioned. It will take about 10 minutes to complete the form. Agreeing to participate in this survey is purely voluntary.... Thank you for your kind participation.

Do you agree to participate in this study -Yes ☐ - No ☐

Part 1\ Demographic data (select only one response option per question) :

1- Gender : - Male ☐ - Female ☐

2- Age : ☐ years

3- Marital Status : - Married ☐ - Single ☐

- Widower ☐ - Divorced ☐ - Separate ☐

4- Educational level : - Nursing graduate ☐ - Diploma ☐

-BSC (Bachelor's) ☐ - M.N.S (Master's) ☐

- Ph.D. (Doctorate) ☐

5- Years of service : ☐ years ☐ months (less than a year)

6- Have you participated in training courses on hepatitis B and its prevention? - Yes ☐ - No ☐

7- Have you been punctured or injured by needles or a sharp object while working ? - Yes ☐ - No ☐

8- Have you had the hepatitis B vaccine (if the answer is yes, mention the number of doses) ? - Yes ☐ - one ☐ two ☐ three ☐

- No ☐

2 / First: The knowledge of the nurses about viral hepatitis B and its signs & symptoms (select one answer for each question as you see fit).

No.	questions	choices
1	**Hepatitis B virus infection is caused by a virus that contains in its genetic composition:**	A. Partially single-stranded RNA.
		B. partially double-stranded RNA.
		C. partially single-stranded DNA.
		D- partially double-stranded DNA.
		E- I don't know.
2	**The viral family to which the hepatitis B virus belongs is called:**	A- Picornaviridae.
		B- Flaviviridae.
		C- Hepeviridae.
		D- Everything mentioned in (A, B, and C) is incorrect.
		E- I don't know.
3	**Which of these age groups, if their members are infected with hepatitis B virus, most of them do not show symptoms in general?**	A- Children under the age of five.
		B- Persons between the ages of five and adolescence.
		C- Adolescents and young adults.
		D- Persons aged (35-50) years.
		E- I don't know.
4	**HBV infection is more severe in one of the following age groups:**	A- Children under the age of five.
		B- Persons between the ages of five and adolescence.
		C- Adults over 25 years old.
		D- Elderly people over 60 years .
		E- I don't know.
5	**The incubation period for hepatitis B virus after infection ranges as follows:**	A- From (30-45) days.
		B - From (30-65) days.
		C- From (45-120) days.
		D- From (30-180) days.
		E- I don't know.
6	**The chance of hepatitis B becoming infected increases from the acute to the chronic phase depending on :**	A- The amount of viruses entering the body upon exposure.
		B - The gender of the affected person, which increases in males.
		C- The age of the patient, which increases as the age decreases.
		D- (BMI), which increases with the increase in body mass.
		E- I don't know.
7	**Which of the following signs & symptoms are not signs & symptoms of hepatitis B in the acute phase?**	A- Joint pain.
		B- Swelling of the extremities.
		C- Dark urine.
		D- Clay-Colored Stool.
		E- I don't know.

Second \ the knowledge of the nurses about (transmission, diagnosis, treatment) of hepatitis B infection (select one answer for each question as you see fit).

No.	questions	choices
1	**Which of the following people is not considered to be at high risk of HBV infection?**	A- Developmentally disabled persons in long-term care facilities.
		B- Persons with diabetes .
		C- Persons with chronic liver disease.
		D- People born in countries with an hepatitis B virus prevalence of 1%
		E- I don't know.
2	**The probability of infection with hepatitis B virus after exposure to contaminated needle sticks is:**	A- (3%-18%).
		B- (3%-20%).
		C- (1.8%-20%).
		D- (6%-30%).
		E- I don't know.
3	**Which of the following bodily fluids is not considered probable infection unless it contains blood?**	A - Cerebrospinal fluid.
		B - Synovial fluid.
		C- Vomitus
		D- Everything mentioned in (A, B, and C) is true.
		E- I don't know.
4	**The hepatitis B virus remains active and contagious on surfaces for:**	A- At least 48 hours.
		B - At least 10 days.
		C- At least 72 hours.
		D - at least 7 days.
		E- I don't know.
5	**Laboratory diagnosis, when examining the blood for HBV infection, focuses on detecting one of these antigens:**	A- Core antigen (HBcAg)
		B- Surface antigen (HBsAg)
		C- e antigen (HBeAg)
		D- All of the above is true.
		E- I don't know.
6	**The result of a blood test to detect hepatitis B virus is positive after a period of:**	A- (7-15) weeks after exposure to the virus.
		B - (1-9) weeks after exposure to the virus.
		C- (7-15) days after exposure to the virus.
		D- (3-12) weeks after exposure to the virus.
		E- I don't know.
7	**All patients whose infection does not turn into the chronic phase will have a negative HBV blood test after:**	**A.** 24 weeks from the onset of symptoms.
		B. 20 weeks from the onset of symptoms.
		C. 15 weeks from the onset of symptoms.
		D. 12 weeks from the onset of symptoms.
		E. I don't know.

8	**Which of the following measures not used to treat and care for hepatitis B patients in the acute phase?**	**A.** Keep the patient comfortable.
		B. Replacing fluids lost due to vomiting and diarrhea.
		C. Raising the feet to avoid increasing swelling in them as much as possible.
		D. Avoid giving the patient a combination of paracetamol and anti-emetics.
		E. I don't know.

Third / the knowledge of the nurses towards prevention of hepatitis B infection (select one answer for each question as you see fit).

No.	questions	choices
1	**Which of the following points are more important than others in hands washing?**	**A.** The technique used (steps) for washing hands.
		B. The type of soap used.
		C. What was mentioned in (A, B) is true.
		D. The method of drying the hands after washing them is completed.
		E. I don't know.
2	**Wearing the gown when dealing with a person with HBV is required in one of the following cases:**	**A.** When dealing directly with the patient in all clinical procedures.
		B. When entering the room designated for the patient.
		C. When the blood and body fluids may come into contact with the body.
		D. Everything mentioned in (A, B, C) is true.
		E. I don't know.
3	**When the eyes are exposed to blood or body fluids, they can be washed with one of the following materials:**	**A.** Use a mixture of clean water and surgical soap.
		B . saline.
		C.A sterilizing substance that contains a reduced percentage of alcohol.
		D. Everything mentioned in (A, B, C) is incorrect.
		E. I don't know.
4	**Two pairs of gloves (double gloves) should be worn when handling a HBV patient in one of the following :**	**A.** If the quality of the gloves is poor and is likely to be easily damaged as a result of the work.
		B. If the health care provider suffers from an injury to the skin (such as a cut or bruise).
		C. When caring for the patient in every clinical procedure
		D. In the clinical procedure in which the rate of exposure increases.
		E. I don't know

5	**It is preferable to use one of the following sterile materials when dealing with blood and fluids contaminated with HBV spilled on surfaces for sterilization:**	**A.** Substances that contain iodine at a concentration of 10%, such as povidone.
		B. Agents that contain 70-95% alcohol.
		C. Chlorine-releasing agents at a concentration of 10 000 parts per million (ppm).
		D. Ordinary detergents will suffice.
		E. I don't know
6	**When exposed to a puncture with a used needle, it is recommended to deal with that needle by doing one of the following:**	**A.** Sending it to the lab. to find out if it is contaminated by hepatitis B virus or not and to take the necessary measures.
		B. Not to send it to the lab. to find out if it is contaminated with hepatitis B virus or not , if its source is known.
		C. Sending it to the lab. to find out if it is contaminated with hepatitis B virus or not, only if its source is unknown.
		D. Not sending it to the lab.to find out if it is contaminated with hepatitis B virus or not, if its source is known or unknown.
		E. I don't know
7	**Immunoglobulin should be taken as soon as possible after exposure when required (preferably within 24 hours) where its effectiveness is not known after:**	**A.** 48 hours or more.
		B. 72 hours or more.
		C. 5 days or more.
		D. 7 days or more.
		E. I don't know.
8	**Immunoglobulin gives the body temporary immunity against HBV for a period that lasts:**	**A.** (1-2) months.
		B. (2 - 3) months.
		C. (3-6) months.
		D. (2-4) months.
		E. I don't know
9	**Exposure to contaminated needles and sharp instruments should be reported if the healthcare provider:**	**A.** Does not have a response to the hepatitis B vaccine.
		B. Has no or poor response to the hepatitis B vaccine.
		C. Has a high response after receiving a full series of hepatitis B vaccine.
		D. Everything mentioned in (A, B, C) is true.
		E. I don't know
10	**Which of the following groups cannot be given the hepatitis B vaccine?**	**A.** People infected with the human immunodeficiency virus (AIDS).
		B. People with hepatitis C virus.
		C. What is mentioned in (A, B) is correct.
		D. People who are allergic to the vaccine.
		E. I don't know

11	**To manufacture the hepatitis B virus vaccine, one of the following methods is used:**	**A.** Replicating the virus, then killing it, and making a vaccine from it.
		B. Replicating the virus, then weakening it, and making a vaccine from it.
		C. Manufacture of the vaccine through genetic engineering.
		D. Extracting the toxins secreted by the virus and manufacturing the vaccine from them
		E. I don't know
12	**HBV vaccine can be given together with immunoglobulin if the condition of the exposed person requires, as follows:**	**A.** In the same place (the extremities), but with a period of not less than two hours left between them.
		B. In two different places (different extremities) at the same time.
		C. In the same place and at the same time.
		D. In two different places (different extremities), leaving a period of no less than two hours between them .
		E. I don't know
13	**A person is considered immune to HBV if he has a level of (anti-HBs) after completing the vaccine doses as at least as follows:**	**A.** More than or equal to 10 mIU/mL
		B. More than or equal to 20 mIU/mL
		C. More than or equal to 50 mIU/mL
		D. More than or equal to 100 mIU/mL
		E. I don't know**.**
14	**When taking the HBV vaccine, we get additional protection from one of the following types of viral hepatitis:**	**A.** Hepatitis A virus.
		B. Hepatitis D virus.
		C. Hepatitis E virus.
		D. All of the above is incorrect.
		E. I don't know**.**
15	**In some cases, the person's condition after exposure to infection requires giving more than one dose of immunoglobulin, and it is given as :**	**A.** Two doses separated by a period of 30 days.
		B. Three doses, 15 days separated between each dose and the next dose
		C. Two doses separated by at least 45 days.
		D. Only one dose should be given, regardless of the person's condition.
		E. I don't know**.**

Part 3\ The attitudes of the nurses about hepatitis B infection and its prevention (choose only one option for each statement).

N.	Statement	Strongly agree	Agree	Not sure	Dis agree	Strongly Dis agree
1	I believe that infection with HBV is not as dangerous as infection with the AIDS virus.					
2	I believe that hepatitis B infection is not transmitted in the absence of visible blood on the surfaces.					
3	I believe it is possible to distinguish between HBV and other types of viral hepatitis clinically.					
4	I believe that HBV has a specific treatment that cures it completely.					
5	I believe that the HBV vaccine should not be given more than three doses.					
6	I believe the level of (anti-HBs) does not decrease over time after receiving the HBV vaccine.					
7	I believe there is a need for HBV post-exposure precautions if the person is responsive to the vaccine after a full series of vaccinations, even if the source is infected.					
8	I believe that exposure to direct contact with the blood and body fluids of the patient is not risk because it does not necessarily lead to infection with the HBV.					
9	I believe it is not necessary to confirm the response to the HBV vaccine after completing the series of doses.					
10	I believe that people who are already infected with the HBV will not get any benefit, and may harm them when they get the vaccine.					

E1 /Arabic Questionnaire

رقم الاستمارة ☐

استبيان حول معارف وتوجهات الممرضين تجاه الوقاية من التهاب الكبد الفيروسي B

أخي الممرض .. اختي الممرضة .. السلام عليكم..

يرجى تخصيص بعض الوقت لقراءة كل سؤال والإجابة عليه بعناية عن طريق وضع علامة [✔] امام الاجابة الصحيحة برايك . نتائج هذه الدراسة ستكون مفيدة في تحسين معارف وتوجهات الممرضين تجاه التهاب الكبد الفيروسي نوع B والوقاية منه . سيتم التعامل مع المعلومات التي ستعطيها إلى أقصى درجات السرية .ولن يتم ذكر اسم المشارك. سيستغرق الامر حوالي ١٠ دقائق لإكمال النموذج. الموافقة على المشاركة في هذا الاستطلاع طوعية بحتة.... أشكركم على حسن المشاركة.

هل توافق على المشاركة في هذه الدراسة - نعم ☐ - لا ☐

الجزء الاول \ البيانات الديموغرافية (حدد خيار رد واحد فقط لكل سؤال) .

١- الجنس - ذكر ☐ -انثى ☐

٢- العمر ☐ سنة

٣- الحالة الزوجية - متزوج \ ـة ☐ - اعزب\ عزباء ☐ - ارمل \ـة ☐

- مطلق \ـة ☐ - منفصل \ـة ☐

٤- الشهادة الحاصل عليها - اعدادية ☐ - دبلوم ☐ - بكالوريوس ☐

- ماجستير ☐ - دكتوراه ☐

٥- عدد سنوات الخدمة ☐سنة ☐ شهر (اذا كانت الخدمة اقل من سنة يذكر عدد الأشهر)

٦- هل شاركت في دورات سابقة حول التهاب الكبد الفيروسي B والوقاية منه - نعم ☐

- لا ☐

٧- هل تعرضت للوخز او الجرح بالإبر او بأداة حادة اثناء العمل - نعم ☐ - لا ☐

٨-هل اخذت لقاح التهاب الكبد الفيروسي B (اذا كانت الاجابة نعم اذكر عدد الجرعات)

- نعم ☐ - جرعة واحدة ☐ - جرعتان ☐ - ثلاث جرعات ☐

-لا ☐

الجزء الثاني \ اولاً: معارف الممرضين حول التهاب الكبد الفيروسي B وعلاماته واعراضه (حدد اجابة واحدة لكل سؤال بما تراه مناسبا).

ت	الاسئلة	الخيارات
١	**عدوى التهاب الكبد الفيروسي B ناجمة عن فيروس يحتوي في تركيبته الجينية على :-**	أ- RNA احادي الشريط جزئيا . ب- RNA مزدوج الشريط جزئيا . ج- DNA احادي الشريط جزئيا . د- DNA مزدوج الشريط جزئيا . ه- لا اعلم .
٢	**العائلة الفيروسية التي ينتمي لها فيروس التهاب الكبد الفيروسي B تسمى :-**	أ- بايكورنافارديا Picornaviridae . ب- فيلافيفارديا Flaviviridae . ج- هيبيفارديا Hepeviridae . د- كل ما ذكر في (أ ، ب ، ج) غير صحيح. ه- لا اعلم .
٣	**اي هذه الفئات العمرية اذا أصيب افرادها بعدوى التهاب الكبد الفيروسي B فمعظمهم لا تظهر عليهم الأعراض بشكل عام ؟**	أ- الاطفال دون سن الخامسة . ب- الأشخاص بين سن الخامسة والمراهقة. ج- الأشخاص المراهقين و الشباب . د- الأشخاص في سن (٣٥ -٥٠) سنة . ه- لا اعلم .
٤	**يكون التهاب الكبد الفيروسي B اكثر حدة عند احدى الفئات العمرية التالية :**	أ- الاطفال دون سن الخامسة . ب- الاطفال بين سن الخامسة والمراهقة . ج- البالغين الذين تزيد اعمارهم على ٢٥ سنة . د- كبار السن الذين تزيد اعمارهم على ٦٠ سنة . ه- لا اعلم .
٥	**تتراوح فترة الحضانة لفيروس التهاب الكبد الفيروسي B بعد الاصابة كالآتي :**	أ- من (٣٠-٤٥)يوما . ب- من (٣٠- ٦٥) يوما . ج- من (٤٥- ١٢٠) يوما . د- من (٣٠- ١٨٠) يوما . ه- لا اعلم .
٦	**يزداد احتمال تحول التهاب الكبد الفيروسي B من الطور الحاد الى الطور المزمن اعتمادا على :-**	أ- كمية الفيروسات الداخلة الى الجسم عند التعرض. ب- جنس الشخص المصاب حيث يزداد عند الذكور. ج- عمر الشخص المصاب حيث يزداد كلما قل العمر. د- كتلة الجسم BMI حيث يزداد مع ازدياد كتلة الجسم. ه- لا اعلم .

٧	**اي من العلامات والاعراض التالية ليست من علامات واعراض التهاب الكبد الفيروسي B في الطور الحاد ؟**	أ- الم المفاصل . ب- تورم الاطراف . ج- البول الداكن . د- الخروج (الغائط) بلون الطين. ه- لا اعلم .

ثانياً \ معارف الممرضين حول (انتقال ، تشخيص، علاج)عدوى التهاب الكبد الفيروسي B (حدد اجابة واحدة لكل سؤال بما تراه مناسبا).

ت	الاسئلة	الخيارات
١	**اي الفئات التالية لا تعتبر من الاشخاص الاكثر عرضة لخطر الإصابة بالتهاب الكبد الفيروسي B ؟**	أ- ذوو الاعاقة التنموية المتواجدون في مؤسسات الرعاية طويلة الأمد . ب- المصابون بمرض السكري . ج- الاشخاص الذين ولدوا في بلدان ينتشر فيها فيروس التهاب الكبد B بنسبة ١٪ . د- الأشخاص المصابون بأمراض الكبد المزمنة . ه- لا اعلم .
٢	**نسبة احتمال الاصابة بعدوى التهاب الكبد الفيروسي B بعد التعرض للوخز بالإبر والأدوات الحادة الملوثة تبلغ :**	أ- من (٣٪- ١٨٪). ب- من (٣٪- ٢٠٪). ج- من (١,٨٪ -٢٠٪). د- من (٦٪- ٣٠٪). ه- لا اعلم.
٣	**اي من سوائل الجسم التالية لا تعتبر العدوى عند التعرض له محتملة ما لم يحتوي على الدم ؟**	أ- السائل الدماغي الشوكي. ب- السائل المفصلي. ج- القيء. د- كل ما ذكر في (أ ، ب، ج) صحيح. ه- لا اعلم.
٤	**يظل فيروس التهاب الكبد الفيروسي B فعالا ومعديًا على الأسطح لمدة :**	أ- ٤٨ ساعة على الاقل. ب- ١٠ ايام على الاقل. ج- ٧٢ ساعة على الاقل. د- ٧ ايام على الاقل. ه- لا اعلم.
٥	**يركز التشخيص المختبري عند فحص الدم لمعرفة اصابة الشخص بعدوى التهاب الكبد الفيروسي B على الكشف عن احد هذه المستضدات :**	أ- المستضد الاساسي (HbcAg). ب- المستضد السطحي (HBsAg). ج- المستضد e (HBeAg) . د- كل ما ذكر اعلاه صحيح. ه- لا اعلم.
٦	**تكون نتيجة فحص الدم للكشف عن التهاب الكبد الفيروسي B ايجابية بعد مرور فترة :-**	أ- من (٧- ١٥) اسبوع بعد التعرض للفيروس ب- من(١ - ٩) اسابيع بعد التعرض للفيروس . ج- من (٧- ١٥)يوم بعد التعرض للفيروس . د- من(٣-١٢)اسبوع بعد التعرض للفيروس ه- لا اعلم .

٧	**جميع المرضى الذين لا تتحول اصابتهم الى الطور المزمن ستكون نتيجة فحص الدم للكشف عن التهاب الكبد الفيروسي B سلبية بعد:-**	أ- ٢٤ اسبوع من ظهور الاعراض . ب- ٢٠ اسبوع من ظهور الاعراض . ج- ١٥ اسبوع من ظهور الاعراض . د- ١٢ اسبوع من ظهور الاعراض . ه- لا اعلم .
٨	**اي من التدابير التالية لا تستعمل للعلاج والعناية بالمصاب بالتهاب الكبد الفيروسي B في الطور الحاد ؟**	أ- الحفاظ على راحة المريض. ب- تعويض السوائل المفقودة بسبب القيء والإسهال. ج- رفع القدمين لتجنب ازدياد التورم فيها قدر الامكان. د- تجنب إعطاء المريض توليفة من عقار باراسيتامول ومضادات القيء. ه- لا اعلم.

ثالثاً \ معارف الممرضين تجاه الوقاية حول عدوى التهاب الكبد الفيروسي B (حدد اجابة واحدة لكل سؤال بما تراه مناسبا).

ت	العبارات	الخيارات
١	**اي النقاط التالية تعتبر اكثر اهمية من غيرها ويجب مراعاتها في غسل الايدي عند عمل الاجراءات السريرية؟**	أ- التقنية المستخدمة (الخطوات) في غسل الايدي . ب- نوعية الصابون المستخدم . ج- ما ذكر في (أ ، ب) صحيح . د- طريقة تجفيف الايدي بعد اكمال غسلها. ه- لا اعلم .
٢	**يكون ارتداء العباءة (الكاون)عند التعامل مع المصاب بالتهاب الكبد B مطلوبا في احد الحالات التالية :**	أ- عند التعامل المباشر مع المريض المصاب في جميع الاجراءات السريرية ب- عند الدخول الى الغرفة المخصصة المريض المصاب . ج- عندما تكون ملامسة الدم وسوائل جسم المريض المصاب للجسم محتملا . د- كل ما ذكر في (أ ، ب ، ج) صحيح . ه- لا اعلم .
٣	**عند تعرض العينين للدم او سوائل الجسم يمكن غسلها بأحد المواد التالية :**	أ- استخدام محلول خليط من الماء النظيف والصابون الجراحي . ب- محلول ملحي. ج- مادة معقمة تحتوي نسبة مخففة من الكحول. د- كل ما ذكر في (أ ، ب، ج) غير صحيح ه- لا اعلم .

٤	**يجب ارتداء زوجين من الكفوف (كفوف مزدوجة) عند التعامل مع المصاب بالتهاب الكبد الفيروسي B في احد الحالات التالية:**	أ- اذا كانت جودة الكفوف رديئة ومحتمل ان تتلف نتيجة العمل بسهولة. ب- اذا كان مقدم الرعاية الصحية يعاني من اصابة في الجلد مثل (جرح او كدمة) . ج- عند العناية بالمريض المصاب في كل اجراء سريري د- في الاجراء السريري الذي تزيد فيه نسبة التعرض . ه- لا اعلم .
٥	**يفضل استخدام احد المواد المعقمة التالية عند التعامل مع الدم والسوائل الملوثة بفيروس التهاب الكبد B المنسكبة على الاسطح لتعقيمها**	أ- المواد التي تحتوي على الآيودين بتركيز ١٠% مثل البوفيدون . ب- المواد التي تحتوي على الكحول بنسبة ٧٠-٩٥ % . ج- المواد التي تحتوي على الكلور بتركيز ١٠٠٠٠ جزء في المليون. د- المواد المنظفة الاعتيادية تفي بالغرض . ه- لا اعلم .
٦	**عند الوخز بإبرة او اداة حادة مستعملة ومرمية مثلا(في سلة المهملات) فينصح بالتعامل مع تلك الابرة او الاداة باتباع احد الامور التالية :**	أ- ارسالها الى المختبر لفحصها ومعرفة اذا كانت ملوثة اولا واتخاذ الاجراءات اللازمة. ب- عدم ارسالها الى المختبر لفحصها ومعرفة اذا كانت ملوثة اولا اذا كان مصدرها معروفا . ج- ارسالها الى المختبر لفحصها ومعرفة اذا كانت ملوثة اولا فقط اذا كان مصدرها مجهولا. د- عدم ارسالها الى المختبر لفحصها ومعرفة اذا كانت ملوثة اولا اذا كان مصدرها معروفا او مجهولا. ه- لا اعلم .
٧	**عند الوخز بإبرة او اداة حادة ملوثة وتتطلب الحالة اخذ المصل(الغلوبيولين المناعي) فيجب ان يؤخذ في اسرع وقت ممكن بعد التعرض(يفضل خلا ل ٢٤ ساعة) حيث تكون فاعليته غير معروفة بعد مرور :**	أ- ٤٨ ساعة واكثر . ب- ٧٢ ساعة واكثر. ج- ٥ ايام واكثر . د- ٧ ايام واكثر . ه- لا اعلم .
٨	**يمنح المصل (الغلوبيولين المناعي) الجسم مناعة مؤقتة ضد التهاب الكبد الفيروسي B مدة تستمر :**	أ- من (١- ٢) شهر . ب- من (٢ - ٣) اشهر. ج- من (٣- ٦) اشهر. د- من (٢- ٤) اشهر. ه- لا اعلم .
٩	**يجب الابلاغ عن حالات التعرض للوخز بالإبر والأدوات الحادة الملوثة في حالة اذا كان مقدم الرعاية الصحية :**	أ- ليس لديه استجابة للقاح التهاب الكبد الفيروسي B . ب- ليس لديه استجابة او استجابته ضعيفة للقاح التهاب الكبد الفيروسي B. ج- لديه استجابة عالية بعد تلقي سلسلة كاملة من لقاح التهاب الكبد الفيروسيB . د- كل ما ذكر في (أ ، ب، ج) صحيح . ه- لا اعلم .

١٠	**لأي من الفئات التالية لا يمكن اعطاء لقاح التهاب الكبد الفيروسي B ؟**	أ-	المصابون بمرض نقص المناعة البشرية المكتسبة (الايدز) .
		ب-	المصابون بالتهاب الكبد الفيروسي C.
		ج-	ما ذكر في (أ ،ب) صحيح .
		د-	الاشخاص الذين لديهم حساسية للقاح .
		ه-	لا اعلم .
١١	**لتصنيع لقاح التهاب الكبد الفيروسي B يتم اتباع واحدة من الطرق التالية :**	أ-	مضاعفة الفيروس ثم قتله وتصنيع اللقاح منه .
		ب-	مضاعفة الفيروس ثم تضعيفه وتصنيع اللقاح منه .
		ج-	تصنيع اللقاح من خلال الهندسة الوراثية.
		د-	استخلاص السموم(toxoid)التي يفرزها الفيروس وتصنيع اللقاح منها.
		ه-	لا اعلم.
١٢	**يمكن اعطاء لقاح التهاب الكبد الفيروسي B مع المصل (الغلوبيولين المناعي) معا اذا تطلبت حالة الشخص المتعرض للإصابة كما يأتي :**	أ-	في نفس المكان(الطرف) ولكن مع ترك مدة لا تقل عن ساعتين بينهما .
		ب-	في مكانين مختلفين (طرفين مختلفين) وفي نفس الوقت.
		ج-	في نفس المكان (الطرف)ونفس الوقت.
		د-	في مكانين مختلفين (طرفين مختلفين) مع ترك مدة لا تقل عن ساعتين .
		ه-	لا اعلم .
١٣	**يعتبر الشخص محصناً ضد التهاب الكبد الفيروسي B اذا كان يمتلك مستوى اجسام مضادة (anti-HBs) بعد اكمال جرعات اللقاح كالاتي على اقل تقدير:**	أ-	اكثر او يساوي ١٠ مللي وحدة دولية / مل.
		ب-	اكثر او يساوي ٢٠ مللي وحدة دولية / مل.
		ج-	اكثر او يساوي ٥٠ مللي وحدة دولية / مل.
		د-	اكثر او يساوي ١٠٠ مللي وحدة دولية / مل.
		ه-	لا اعلم.
١٤	**عند اخذ لقاح التهاب الكبد الفيروسي B نحصل على وقاية اضافية من احد انواع التهاب الكبد الفيروسي التالية:-**	أ-	التهاب الكبد الفيروسي A.
		ب-	التهاب الكبد الفيروسي D.
		ج-	التهاب الكبد الفيروسي E.
		د-	كل ما ذكر اعلاه غير صحيح.
		ه-	لا اعلم .
١٥	**في بعض الحالات تتطلب حالة الشخص بعد التعرض للعدوى اعطاء اكثر من جرعة من المصل (الغلوبيولين المناعي) وتعطى كالاتي :**	أ-	جرعتين تفصل بينهما مدة ٣٠ يوم .
		ب-	ثلاث جرعات تفصل بين كل جرعة واخرى ١٥ يوم.
		ج-	جرعتين تفصل بينهما مدة ٤٥ يوم على الاقل.
		د-	يجب ان لا تعطى سوى جرعة واحدة مهما كانت حالة الشخص .
		ه-	لا اعلم .

الجزء الثالث\ توجهات الممرضين حول عدوى التهاب الكبد الفيروسي B والوقاية منه (حدد خيار واحد فقط لكل عبارة).

ت	العبارات	اتفق بشدة	اتفق	غير متأكد	لا اتفق	لا اتفق بشدة
١	اعتقد ان الإصابة بعدوى التهاب الكبد B ليست خطيرة مثل الإصابة بفيروس الايدز.					
٢	اعتقد ان عدوى التهاب الكبد الفيروسي B لا تنتقل في حال عدم وجود دم مرئي على الاسطح .					
٣	اعتقد أنه يمكن التمييز بين التهاب الكبد الفيروسي B وباقي انواع التهاب الكبد الفيروسي سريريا.					
٤	اعتقد ان التهاب الكبد الفيروسي B له علاج محدد يشفي منه تماماً.					
٥	اعتقد انه لا يجب اعطاء لقاح التهاب الكبد الفيروسي B اكثر من ثلاث جرعات.					
٦	اعتقد ان مستوى الاجسام المضادة في الجسم (anti-HBs) لا ينخفض بمرور الوقت بعد اخذ لقاح التهاب الكبد الفيروسي B .					
٧	اعتقد ان هناك حاجة للإجراءات الوقائية لالتهاب الكبد B بعد التعرض اذا كان الشخص مستجيب للقاح بعد سلسلة كاملة من اللقاح حتى اذا كان المصدر مصابا .					
٨	اعتقد ان التعرض للملامسة المباشرة مع دم وسوائل جسم المريض امرا ليس خطيرا لأنه لا يؤدي بالضرورة للإصابة بالتهاب الكبد الفيروسي B.					
٩	اعتقد انه من غير الضروري التأكد من الاستجابة للقاح التهاب الكبد الفيروسي B بعد اكمال سلسلة الجرعات .					
١٠	اعتقد ان الأشخاص الذين أصيبوا فعلا بفيروس التهاب الكبد B لن يحصلوا على اي فائدة ، وقد يصيبهم الضرر عند اخذ اللقاح.					

{{نهاية الاستبيان. شكرًا لك مرة أخرى على مشاركتك }}

Appendix F
Expert's Panel

ت	اسم الخبير	اللقب العلمي	مكان العمل	الاختصاص الدقيق	سنوات الخبرة
1	د. امين عجيل ياسر	استاذ	كلية التمريض / جامعة بابل	دكتوراه تمريض صحة المجتمع	38 سنة
2	د. سلمى كاظم جهاد	استاذ	كلية التمريض/ جامعة بابل	دكتوراه تمريض صحة المجتمع	36 سنة
3	د. اركان بهلول ناجي	استاذ	كلية التمريض / جامعة بغداد	دكتوراه تمريض صحة المجتمع	35 سنة
4	د. وسام جبار قاسم	استاذ	كلية التمريض / جامعة بغداد	دكتوراه تمريض صحة المجتمع	25 سنة
5	د. فاطمة مكي محمود	استاذ مساعد	كلية التمريض / جامعة كربلاء	دكتوراه تمريض بالغين	27 سنة
6	د. علي عبد الرضا ابو طحين	استاذ مساعد	كلية الطب / جامعة كربلاء	دكتوراه طب اسرة	23 سنة
7	د. حسن عبد الله عذبي	استاذ مساعد	كلية التمريض / جامعة كربلاء	دكتوراه تمريض بالغين	19 سنة
8	د. غزوان عبد الحسين عبد الواحد	استاذ مساعد	كلية التمريض / جامعة كربلاء	دكتوراه تمريض صحة المجتمع	17 سنة
9	د. منصور عبد الله فلاح	استاذ مساعد	كلية التمريض / جامعة الكوفة	دكتوراه تمريض صحة المجتمع	15 سنة
10	د. شهرزاد شمخي الجبوري	استاذ مساعد	كلية الطب / جامعة كربلاء	دكتوراه طب المجتمع	12 سنة
11	د. بشير عقيل مسلم	استاذ مساعد	كلية الطب / جامعة كربلاء	دكتوراه طب المجتمع	10 سنة
12	د. رضا محمد لفته	استاذ مساعد	كلية التمريض / جامعة العميد	دكتوراه تمريض صحة المجتمع	7 سنة
13	د. احمد هاشم عباس	طبيب اختصاص	مركز كربلاء لأمراض الجهاز الهضمي	دكتوراه في الجهاز الهضمي والكبد	8 سنة
14	د. ساجدة خميس عبد الله	مدرس	كلية التمريض / جامعة القادسية	دكتوراه تمريض صحة المجتمع	33 سنة
15	د. حسين منصور علي التميمي	مدرس	كلية التمريض / جامعة الكوفة	دكتوراه تمريض صحة المجتمع	11 سنة
16	د. حقي اسماعيل منصور	مدرس	كلية التمريض / جامعة كربلاء	دكتوراه تمريض صحة المجتمع	4 سنة

Appendix G
Statistical Expert

Republic of Iraq
Ministry of higher education & scientific research
University of Kerbala
College of Nursing

جمهورية العراق
وزارة التعليم العالي والبحث العلمي
جامعة كربلاء
كلية التمريض
الدراسات العليا

اقرار الخبير الاحصائي

اشهد بان الرسالة الموسومة :

(Effect of an Educational Program on Nursing Staff Knowledge and Attitude toward Prevention of Viral Hepatitis B Infection at Kerbala Center for Cardiac Diseases and Surgery).

قد تم الاطلاع على الاسلوب الاحصائي المتبع في تحليل البيانات واظهار النتائج الاحصائية وفق مضمون الدراسة ولأجله وقعت.

توقيع الخبير الاحصائي:
الاسم واللقب العلمي: أ.م. شروق لمياح
الاختصاص الدقيق: إحصاء تطبيقي
مكان العمل: جامعة كربلاء / كلية التمريض
التاريخ: ٦/ ٦ / 2022

العنوان : العراق ـ محافظة كربلاء المقدسة ـ حي الموظفين ـ جامعة كربلاء
Mail: nursing@uokerbala.edu.iq website: nursing.uokerbala.edu.iq

Appendix H
Linguist Expert

Republic of Iraq
Ministry of higher education & scientific research
University of Kerbala
College of Nursing

جمهورية العراق
وزارة التعليم العالي والبحث العلمي
جامعة كربلاء
كلية التمريض
الدراسات العليا

اقرار الخبير اللغوي

اشهد بان الرسالة الموسومة :

(Effect of an Educational Program on Nursing Staff Knowledge and Attitude toward Prevention of Viral Hepatitis B Infection at Kerbala Center for Cardiac Diseases and Surgery)).

قد جرى مراجعتها من الناحية اللغوية بحيث اصبحت بأسلوب علمي سليم خال من الاخطاء اللغوية ولأجله وقعت.

توقيع الخبير اللغوي:
الاسم واللقب العلمي: أ. د. صباح واحد عاد
الاختصاص الدقيق: أستاذ اللغة الانكليزية
مكان العمل: جامعة كربلاء / كلية التربية للعلوم الانسانية
التاريخ: 20/7/2022

العنوان : العراق ـ محافظة كربلاء المقدسة ـ حي الموظفين ـ جامعة كربلاء
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الخلاصة

تعتبر عدوى فيروس التهاب الكبد (ب) من المخاطر المهنية التي تواجه الممرضين أثناء العمل. لذلك ، فإن إعداد البرامج التعليمية لتحسين معارف وتوجهات الممرضين حول الوقاية من فيروس التهاب الكبد (ب) سيساهم في تقليل مخاطر الإصابة. أجريت الدراسة لتقييم فاعلية البرنامج التعليمي، على معارف وتوجهات الممرضين حول الوقاية من الإصابة بفيروس التهاب الكبد (ب).

كان تصميم الدراسة شبه تجريبي، وتم تنفيذه خلال الفترة من ١ تشرين الثاني ٢٠٢١ إلى ١٦ حزيران ٢٠٢٢ ، في مركز كربلاء لأمراض وجراحة القلب. عينة ملائمة مكونة من (٥٠)ممرض مقسمة الى، (٢٥) ممرض لمجموعة الدراسة (تم تضمينهم في البرنامج التعليمي)، (٢٥) ممرض للمجموعة الضابطة (لم يتم تضمينهم في البرنامج التعليمي). استخدمت أداة الدراسة أسئلة الاختيار من متعدد لقياس المعارف، ومقياس لكرت الخماسي لقياس التوجهات.

كانت نتيجة الدراسة عند المقارنة بين اختبارات ما قبل البرنامج وبعده ، بالنسبة لمعارف مجموعة الدراسة ، متوسط النتيجة (قبل = ٠,٢٦ ، بعد = ٠,٩٥) ، والقيمة الاحتمالية (٠,٠٠٠)، وبالنسبة للتوجهات كان متوسط النتيجة (قبل = ٢,٩١ ، بعد = ٤,١٦) ، والقيمة الاحتمالية (٠,٠٠٠). بينما كانت نتائج المعارف للمجموعة الضابطة، متوسط النتيجة (قبل = ٠,٢٦ ، بعد = ٠,٢٨) ، والقيمة الاحتمالية (٠,٠٩) ، وبالنسبة للتوجهات كان متوسط النتيجة (قبل = ٢,٨٩ ، بعد = ٢,٩٩) ، والقيمة الاحتمالية (٠,١٧٧). أظهرت النتائج وجود علاقة ذات دلالة إحصائية بين المعارف وبعض البيانات الديموغرافية ، تشمل (المستوى التعليمي بقيمة الاحتمالية (٠,٠٢٣) ، الجنس والمشاركة في دورة تدريبية بقيمة احتمالية (٠,٠٠٠) على التوالي). وعلاقة ذات دلالة إحصائية بين التوجهات وبعض البيانات الديموغرافية ، تشمل (الجنس والمشاركة في دورة تدريبية بقيمة احتمالية (٠,٠٠٠) على التوالي).

وخلصت الدراسة إلى أن تنفيذ البرنامج التعليمي أظهر تحسناً في معارف وتوجهات مجموعة الدراسة فيما يتعلق بالوقاية من الإصابة بفيروس التهاب الكبد الفيروسي (ب)، بينما ظل الوضع على ما هو عليه بالنسبة للمجموعة الضابطة.

أوصت الدراسة ببذل المزيد من الجهود لإعداد البرامج التعليمية المناسبة لتحسين وتحديث معارف وتوجهات الممرضين حول الوقاية من التهاب الكبد الفيروسي (ب).

جامعة كربلاء / كلية التمريض

فاعلية برنامج تعليمي على معارف وتوجهات الممرضين حول الوقاية من عدوى التهاب الكبد الفيروسي نوع (ب) في مركز كربلاء لأمراض وجراحة القلب

رسالة تقدم بها

عادل محمد جياد

الى مجلس كلية التمريض/ جامعة كربلاء جزء من متطلبات نيل درجة

الماجستير في علوم التمريض

بإشراف

أ.م.د. سلمان حسين فارس

ربيع الاول - ١٤٤٤ هـ **تشرين الأول - ٢٠٢٢ م**