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Review Article
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A Review Article on Different Types of Hepatitis

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An Overview On Different Types Of Hepatitis Has Been Included In This Article, Hepatitis(A) People who use drugs are at risk for acquiring hepatitis A. Outbreaks occur among people who inject drugs (Daniels et al., 2009; Wells, Fenaughty, Cagle, & Jaffe, 2006) and are associated with poor hygiene and low socioeconomic status (Crowcroft, 2003; Quaglio, Lugoboni, Messelani, Des Jarlais, & Lechi, 2006),HEPATITIS(B) Hepatitis B can be acute or chronic. More than 90 percent of infants and 30 percent of children ages 1–5 years who have been exposed to HBV will remain chronically infected with HBV. By contrast, approximately 90 percent of adults with HBV infection alone (i.e., without co-infection) recover completely from HBV infection and do not become chronically infected (CDC, 2010c). For those with chronic infection, compromise of the immune system (e.g., by chemotherapy or HIV co-infection) places the person at risk for reactivation (Luetkemeyer, 2010; CDC, 2009), HEPATITIS(C) Hepatitis C can be acute or chronic, but it starts as an acute infection (that may go unrecognized). Unlike people with hepatitis A and B, people who have hepatitis C and clear the virus do not develop immunity; they can become reinfected with the virus at a later date.

Keywords: Hepatitis(A), Hepatitis(B), Hepatitis(C), Hepatitis(D), Hepatitis (E), Hepatitis (G).

INTRODUCTION:

An estimated 3.5–5.3 million people in the United States live with chronic viral hepatitis (Institute of Medicine [IOM], 2010). Viral hepatitis is often a silent disease whose symptoms and signs become evident only after the disease has caused severe liver damage. The symptoms of hepatitis can take decades to manifest, so many people who are infected with hepatitis are unaware that they have the disease and therefore do not seek treatment.[1] As a result, between 2010 and 2020, an estimated 150,000 people in the United States could die of liver cancer or other hepatitis-related liver disease (IOM, 2010). For many of these people, substance use will be a major factor that contributes to or worsens their hepatitis-related outcomes.

All people who use or have used illicit substances are at risk of contracting viral hepatitis. Injection drug use (IDU) is the primary way of contracting hepatitis C, and people who use substances are at risk for contracting other forms of viral hepatitis. Substance use disorders (SUDs) do not cause viral hepatitis, but people can contract or spread some types of viral hepatitis by sharing needles and other drug paraphernalia. In people who have chronic hepatitis, continued use of alcohol contributes to and frequently accelerates liver damage (Bhattacharya & Shuhart, 2003), increasing the likelihood that the individuals will develop cirrhosis or liver cancer.

In 2010, the U.S. Department of Health and Human Services (HHS) convened an interagency working group on viral hepatitis, comprised of experts throughout HHS to develop a comprehensive strategy for addressing the prevention, screening, and treatment of viral hepatitis, and for improving the coordination of care and treatment of individuals infected with viral hepatitis.2 The working group broadened the scope of expertise even further by soliciting information from other government agencies, professional organizations, community organizations, and members of the general public. As a result of many months of work by this diverse group of experts, HHS recently released Combating the Silent Epidemic of Viral Hepatitis: U.S. Department of Health and Human Services Action Plan for the Prevention, Care and Treatment of Viral Hepatitis (also called the Viral Hepatitis Action Plan) (HHS, 2011). This TIP supports the goals and objectives of the Viral Hepatitis Action Plan by providing information on the prevention and treatment of viral hepatitis and by encouraging behavioral health professionals to recommend hepatitis screening for their clients who might be at risk for hepatitis infection[3].

Viral hepatitis can be prevented and treated. Counselors, health professionals, and administrators in SUD treatment settings play an important role in promoting the prevention and treatment of viral hepatitis among their clients.

Many illnesses and conditions can cause inflammation of the liver (hepatitis), but certain viruses cause about half of all hepatitis in people. Viruses that primarily attack the liver are called hepatitis viruses. There are several types of hepatitis viruses including types A, B, C, D, E, and possibly G. Types A, B, and C are the most common.

All hepatitis viruses can cause acute hepatitis.

Viral hepatitis types B and C can cause chronic hepatitis[4].

Symptoms of acute viral hepatitis include fatigue, flu-like symptoms, dark urine, light-colored stools, fever, and jaundice; however, acute viral hepatitis may occur with minimal symptoms that go unrecognized. Rarely, acute viral hepatitis causes fulminant hepatic failure5.

The symptoms of chronic viral hepatitis often are mild and nonspecific, and the diagnosis of chronic hepatitis often is delayed. viruses, and through injectable immunoglobulins or by vaccines; however, vaccines are available for only hepatitis A and B6.

Those at risk for viral hepatitis B and C include workers in the health care profession, people with multiple sexual partners, intravenous drug abusers, and people with hemophilia. Blood transfusion is a rare cause of viral hepatitis[7].

Viral hepatitis definition and overview.

Hepatitis means inflammation of the liver. Many illnesses and conditions can cause inflammation of the liver, for example, drugs, alcohol, chemicals, and autoimmune diseases. Many viruses, for example, the virus causing mononucleosis and the cytomegalovirus can inflame the liver. Most viruses, however, do not attack primarily the liver; the liver is just one of several organs that the viruses affect. When most doctors speak of viral hepatitis, they are using the definition that means hepatitis caused by a few specific viruses that primarily attack the liver and are responsible for about half of all human hepatitis. There are several hepatitis viruses; they have been named types A, B, C, D, E, F (not confirmed), and G. As our knowledge of hepatitis viruses grows, it is likely that this alphabetical list will become longer. The most common hepatitis viruses are types A, B, and C. Reference to the hepatitis viruses often occurs in an abbreviated form (for example, HAV, HBV, HCV represent hepatitis viruses A, B, and C, respectively.) 8The focus of this article is on these viruses that cause the majority of human viral hepatitis. Hepatitis viruses replicate (multiply) primarily in the liver cells. This can cause the liver to be unable to perform its functions.

The following is a list of major functions of the liver:

The liver helps purify the blood by changing harmful chemicals into harmless ones. The source of these chemicals can be external, such as medications or alcohol, or internal, such as ammonia or bilirubin. Typically, these harmful chemicals are broken down into smaller chemicals or attached to other chemicals that then are eliminated from the body in the urine or stool. The liver produces many important substances, especially proteins that are necessary for good health. For example, it produces albumin, the protein building block of the body, as well as the proteins that cause blood to clot properly9.

The liver stores many sugars, fats and vitamins until they are needed elsewhere in the body.

The liver builds smaller chemicals into larger, more complicated chemicals that are needed elsewhere in the body. Examples of this type of function are the manufacture of a fat, cholesterol, and the protein bilirubin. When the liver is inflamed, it does not perform these functions well, which brings about many of the symptoms, signs, and problems associated with any type of hepatitis10. Each hepatitis viral type (A-F) has both articles and books describing the details of infection with that specific virus. This article is designed to give the reader an overview of the predominant viruses that causes viral hepatitis, their symptoms, diagnosis, and treatments, and should help the reader choose the subject(s) for more in depth information11.

hepatitis. HAV was considered to be acute viral hepatitis because the HAV infections seldom

caused or permanent liver damage that led to hepatic (liver) failure. HBV and HCV produced chronic viral hepatitis[12]. However, these terms are outdated and not currently used as frequently because all of the viruses that cause hepatitis may have acute phase symptoms (see symptoms below)[13]. Prevention techniques and vaccinations have markedly reduced the current incidence of common viral hepatitis infections; however, there remains a population of about 800,000 to 1.4 million people in the U.S. with chronic HBV, and about 2.9 to 3.7 million with chronic HCV according to the CDC. Statistics are incomplete for determining how many new infections occur each year; the CDC documented infections but then goes on to estimate the actual numbers by further estimating the number of unreported infections [14].

Hepatitis A (HAV)

HAV accounts for an estimated 1,781 new infections per year according to the most recent CDC data15. The hepatitis caused by HAV is an acute illness (acute viral hepatitis) that never becomes chronic. At one time, hepatitis A was referred to as "infectious hepatitis" because it could be spread easily from person to person like other viral infections. Infection with hepatitis A virus can be spread through the ingestion of food or water, especially where unsanitary conditions allow water or food to become contaminated by human waste containing hepatitis A (the fecal-oral mode of transmission)[16]. Hepatitis A typically is spread among household members and close contacts through the passage of oral secretions (intimate kissing) or stool (poor hand washing). It also is common to have infection spread to customers in restaurants and among children and workers in day care centers if hand washing and sanitary precautions are not observed[17].

Hepatitis B (HBV)

There were an more than 19,000 new cases of HBV infection estimated by the CDC in 2013 and more than 1,800 people die each year due to the consequences of chronic hepatitis B infection in the United States according to the CDC18. HBV hepatitis was at one time referred to as "serum hepatitis," because it was thought that the only way HBV could spread was through blood or serum (the liquid portion of blood) containing the virus[19]. It is now known that HBV can spread by sexual contact, the transfer of blood or serum through shared needles in drug abusers, accidental needle sticks with needles contaminated with infected blood, blood transfusions, hemodialysis, and by infected mothers to their newborns. The infection also can be spread by tattooing, body piercing, and sharing razors and toothbrushes (if there is contamination with infected blood). About 6% to 10% of patients with HBV hepatitis develop chronic HBV infection (infection lasting at least six months and often years to decades) and can infect others as long as they remain infected. Patients with chronic HBV infection also are at risk of developing cirrhosis, liver failure, and liver cancer. It is estimated that there are 2.2 million people in the U.S. and 2 billion people world-wide who suffer with chronic HBV infections20.

Hepatitis C (HCV)

The CDC reported that there were about 16,500 reported new cases per year (unreported is 13.4 times more than reported) of hepatitis C21. HCV hepatitis was previously referred to as "non-A, non-B hepatitis," because the causative virus had not been identified, but it was known to be neither HAV nor HBV. HCV usually is spread by shared needles among drug abusers, blood transfusion, hemodialysis, and needle sticks[22]. Approximately 90% of transfusion-associated hepatitis is caused by HCV. Transmission of the virus by sexual contact has been reported, but is considered rare. An estimated 50% to 70% of patients with acute HCV infection develop chronic infection23. Patients with chronic HCV infection can continue to infect others. Patients with chronic HCV infection are at risk for developing cirrhosis, liver failure, and liver cancer. It is estimated that there are about 3.2 million people with chronic HCV infection in the U.S[24].

Types D, E, and G Hepatitis.

There also are viral hepatitis types D, E, and G. The most important of these at present is the hepatitis D virus (HDV), also known as the

delta virus or agent. It is a small virus that requires concomitant infection with HBV to survive. HDV cannot survive on its own because it requires a protein that the HBV makes (the envelope protein, also called surface antigen) to enable it to infect liver cells. The ways in which HDV is spread are by shared needles among drug abusers, contaminated blood, and by sexual contact; essentially the same ways as HBV[25].

Individuals who already have chronic HBV infection can acquire HDV infection at the same time as they acquire the HBV infection, or at a later time. Those with chronic hepatitis due to HBV and HDV develop cirrhosis (severe liver scarring) rapidly. Moreover, the combination of HDV and HBV virus infection is very difficult to treat[26].

Hepatitis E virus (HEV) is similar to HAV in terms of disease, and mainly occurs in Asia where it is transmitted by contaminated water. Hepatitis G virus (HGV, also termed GBV-C) was recently discovered and resembles HCV, but more closely, the flaviviruses; the virus and its effects are under investigation, and its role in causing disease in humans is unclear [27]

Who is at risk for viral hepatitis?

People with multiple sexual partners, Intravenous drug users, HIV patients, People with hemophilia who receive blood clotting factors, Blood transfusion, once a common means of spreading viral hepatitis, now is a rare cause of hepatitis. Viral hepatitis is generally thought to be as much as ten times more common among lower socioeconomic and poorly educated individuals. About one third of all cases of hepatitis come from an unknown or unidentifiable source. This means that a person does not have to be in a high risk group in order to be infected with a hepatitis virus. In countries with poor sanitation, food and water contamination with HAV increases risk. Some day care centers may become contaminated with HAV, so children at such centers are at a higher risk for HAV infections[28].

What are the symptoms and signs of viral hepatitis?

The period of time between exposure to hepatitis and the onset of the illness is called the incubation period. The incubation period varies depending on the specific hepatitis virus. Hepatitis A virus has an incubation period of about 15 to 45 days; Hepatitis B virus from 45 to 160 days, and Hepatitis C virus from about 2 weeks to 6 months. Many patients infected with HAV, HBV, and HCV have few or no symptoms of illness. For those who do develop symptoms of viral hepatitis, the most common are flu- like symptoms including:

Loss of appetite, Nausea, Vomiting, Fever, Weakness, Tiredness, Aching in the abdomen, Less common symptoms include:, Dark urine, Light-colored stools, Fever, Jaundice (a yellow appearance to the skin and white portion of the eyes)[28].

What is acute fulminant hepatitis?

hepatitis already described and the additional problems of confusion or coma (due to the liver's failure to detoxify chemicals), as well as bruising or bleeding (due to a lack of blood clotting factors). In fact, up to 80% of people with acute fulminant hepatitis can die within days to weeks; therefore, it is fortunate that acute fulminant hepatitis is rare. For example, less than 0.5% of adults with acute infection with HBV will develop acute fulminant hepatitis. This is even less common with HCV alone, although it becomes more frequent when both HBV and HCV are present together[29].

What is chronic viral hepatitis?

Patients infected with HBV and HCV can develop chronic hepatitis. Doctors define chronic hepatitis as hepatitis that lasts longer than 6 months. In chronic hepatitis, the viruses live and multiply in the liver for years or decades. For unknown reasons, these patients' immune systems are unable to eradicate the viruses, and the viruses cause chronic inflammation of the liver. Chronic hepatitis can lead to the development over time of extensive liver scarring (cirrhosis), liver failure, and liver cancer. Liver failure from chronic hepatitis C infection is the most common reason for liver transplantation in the U.S[30]. Patients with chronic viral hepatitis can transmit the

infection to others with blood or body fluids (for example, sharing needles, sexually, and infrequently by organ donation) as well as infrequently by transmission from mother to newborn[31]

How is viral hepatitis diagnosed?

Symptoms and physical findings

Diagnosis of acute viral hepatitis often is easy, but diagnosis of chronic hepatitis can be difficult. When a patient reports symptoms of fatigue, nausea, abdominal pain, darkening of urine, and then develops jaundice, the diagnosis of acute viral hepatitis is likely and can be confirmed by blood tests. On the other hand, patients with chronic hepatitis due to HBV and HCV often have no symptoms or only mild nonspecific symptoms such as chronic fatigue[32]. Typically, these patients do not have jaundice until the liver damage is far advanced. Therefore, these patients can remain undiagnosed for years to decades[33].

Blood tests

There are three types of blood tests for evaluating patients with hepatitis: liver enzymes, antibodies to the hepatitis viruses, and viral proteins or genetic material (viral DNA or RNA). Liver enzymes: Among the most sensitive and widely used blood tests for evaluating patients with hepatitis are the liver enzymes, called aminotransferases. They include aspartate aminotransferase (AST or SGOT) and alanine aminotransferase (ALT or SGPT). These enzymes normally are contained within liver cells. If the liver is injured (as in viral hepatitis), the liver cells spill the enzymes into the blood, raising the enzyme levels in the blood and signaling that the liver is damaged[34].

The normal range of values for AST is from 5 to 40 units per liter of serum (the liquid part of the blood) while the normal range of values for ALT is from 7 to 56 units per liter of serum. (These normal levels may vary slightly depending on the laboratory.) Patients with acute viral hepatitis (for example, due to HAV or HBV) can develop very high AST and ALT levels, sometimes in the thousands of units per liter. These high AST and ALT levels will become normal in several weeks or months as the patients recover completely from their acute hepatitis. In contrast, patients with chronic HBV and HCV infection typically have only mildly elevated AST and ALT levels, but these abnormalities can last years or decades. Since most patients with chronic hepatitis are asymptomatic (no jaundice or nausea), their mildly abnormal liver enzymes are often unexpectedly encountered on routine blood screening tests during yearly physical examinations or insurance physicals[35].

Elevated blood levels of AST and ALT only means that the liver is inflamed, and elevations can be caused by many agents other than hepatitis viruses, such as medications, alcohol, bacteria, fungi, etc. In order to prove that a hepatitis virus is responsible for the elevations, blood must be tested for antibodies to each of the hepatitis viruses as well as for their genetic material[36].

Viral antibodies:

Antibodies are proteins produced by white blood cells that attack invaders such as bacteria and viruses. Antibodies against the hepatitis A, B, and C viruses usually can be detected in the blood within weeks of infection, and the antibodies remain detectable in the blood for decades thereafter. Blood tests for the antibodies can be helpful in diagnosing both acute and chronic viral hepatitis[37]. In acute viral hepatitis, antibodies not only help to eradicate the virus, but they also protect the patient from future infections by the same virus, that is, the patient develops immunity. In chronic hepatitis, however, antibodies and the rest of the immune system are unable to eradicate the virus. The viruses continue to multiply and are released from the liver cells into the blood where their presence can be determined by measuring the viral proteins and genetic material. Therefore in chronic hepatitis, both antibodies to the viruses and viral proteins and genetic material can be detected in the blood[38].

Examples of tests for viral antibodies are:

anti-HAV (hepatitis A antibody), antibody to hepatitis B core, an antibody directed against

the inner core material of the virus (core antigen). antibody to hepatitis B surface, an antibody directed against the outer surface envelope of the virus (surface antigen). antibody to hepatitis B e, an antibody directed against the genetic material of the virus (e antigen). hepatitis C antibody, the antibody against the C virus. Viral proteins and genetic material:

Examples of tests for viral proteins and genetic material are:

hepatitis B surface antigen, hepatitis B DNA, hepatitis B e antigen, hepatitis C RNA[39]

Other tests:

Obstruction of the bile ducts, from either gallstones or cancer, occasionally can mimic acute viral hepatitis. Ultrasound testing can be used to exclude the possibility of gallstones or cancer[40].

Treatment for viral hepatitis.

Treatment of acute viral hepatitis and chronic viral hepatitis are different. Treatment of acute viral hepatitis involves resting, relieving symptoms and maintaining adequate intake of fluids. Treatment of chronic viral hepatitis involves medications to eradicate the virus and taking measures to prevent further liver damage.

Acute hepatitis

In patients with acute viral hepatitis, the initial treatment consists of relieving the symptoms of nausea, vomiting, and abdominal pain (supportive care). Careful attention should be given to medications or compounds, which can have adverse effects in patients with abnormal liver function (for example, acetaminophen [Tylenol and others], alcohol, etc.). Only those medications that are considered necessary should be administered since the impaired liver is not able to eliminate drugs normally, and drugs may accumulate in the blood and reach toxic levels. Moreover, sedatives and "tranquilizers" are avoided because they may accentuate the effects of liver failure on the brain and cause lethargy and coma. The patient must abstain from drinking alcohol, since alcohol is toxic to the liver. It occasionally is necessary to provide intravenous fluids to prevent dehydration caused by vomiting[41]. Patients with severe nausea and/or vomiting may need to be hospitalized for treatment and intravenous fluids.

Acute HBV is not treated with antiviral drugs. Acute HCV - though rarely diagnosed - can be treated with several of the drugs used for treating chronic HCV. Treatment of HCV is recommended primarily for the 80% of patients who do not eradicate the virus early. Treatment results in clearing of the virus in the majority of patients.

Chronic hepatitis

Treatment of chronic infection with hepatitis B and hepatitis C usually involves medication or combinations of medications to eradicate the virus. Doctors believe that in properly selected patients, successful eradication of the viruses can stop progressive damage to the liver and prevent the development of cirrhosis, liver failure, and liver cancer. Alcohol aggravates liver damage in chronic hepatitis, and can cause more rapid progression to cirrhosis. Therefore, patients with chronic hepatitis should stop drinking alcohol. Smoking cigarettes also can aggravate liver disease and should be stopped[42].

Medications for chronic hepatitis C infection include:

Injectable alpha interferons (Pegasys)

Oral ribavirin (rebetol, copegus)

Oral boceprevir (victrelis)

Simeprevir (olysio)

Oral sofosbuvir (sovaldi)

Oral simeprevir (olysio)

Oral daclatasvir (daklinza)

Oral ledipasvir/sofosbuvir (harvoni)

Oral ombitasvir/ paritaprevir / ritonavir (technivie)

oral ombitasvir/paritaprevir/ritonavir/dasabuvir.[43]

Medications for chronic hepatitis B infection include:

Injectable alpha interferons

Oral lamivudine (Epivir)

Oral adefovir (Hepsera)

Oral entecavir (Baraclude)

Orak telbivudine (Tyzeka)

Oral tenofovir (Viread)

Because of constantly ongoing research and development of new antiviral agents, the current list of medications for chronic hepatitis B and C infections is likely to change every year. Many of those drugs which are currently available are rarely used because of newer, safer, and more effective alternatives.

Decisions regarding treatment of chronic hepatitis can be complex, and should be directed by gastroenterologists, hepatologists (doctors specially trained in treating diseases of the liver), or infectious disease specialists for several reasons including:

The diagnosis of chronic viral hepatitis may not be straightforward. Sometimes a liver biopsy may have to be performed for confirmation of liver damage. Doctors experienced in managing chronic liver diseases must weigh the risk of liver biopsy against the potential benefits of the biopsy[44].

Not all patients with chronic viral hepatitis are candidates for treatment. Some patients need no treatment (since some patients with chronic hepatitis B and C do not develop progressive liver damage or liver cancer).

Medications for chronic infection with hepatitis B and hepatitis C are not always effective. Prolonged treatment (6 months to years) often is necessary. Even with prolonged treatment, rates of successful treatment (defined as complete and lasting eradication of the virus) often are low (usually less than 80% and often around 50%)[45].

Most of the medications such as interferon and ribavirin can have serious side effects, and doses may have to be reduced.

There are several different strains of hepatitis C viruses with differing susceptibilities to medications. For example, hepatitis C type 3 is more likely to respond to interferon injections and ribavirin than type 1. Certain hepatitis B strains are resistant to lamivudine but respond to adefovir or entecavir.

In addition, recent research has shown that combination of certain antiviral medications result in a cure (viral clearance) in many patients with chronic hepatitis C. Further studies and FDA approval is pending.

Fulminant hepatitis

Treatment of acute fulminant hepatitis should be done in centers that can perform liver transplantation since acute fulminant hepatitis has a high mortality (about 80%) without liver transplantation[46].

How is viral hepatitis prevented?

Prevention of hepatitis involves measures to avoid exposure to the viruses, using immunoglobulin in the event of exposure, and vaccines. Administration of immunoglobulin is called passive protection because antibodies from patients who have had viral hepatitis are given to the patient. Vaccination is called active protection because killed viruses or non-infectious components of viruses are given to stimulate the body to produce its own antibodies.

Avoidance of exposure to viruses

Prevention of viral hepatitis, like any other illness, is preferable to reliance upon treatment. Taking precautions to prevent exposure to another individual's blood (exposure to dirty needles), semen (unprotected sex), and other bodily secretions and waste (stool, vomit) will help prevent the spread of all of these viruses[47].

Use of immunoglobulins

Immune serum globulin (ISG) is human serum that contains antibodies to hepatitis A. ISG can be administered to prevent infection in individuals who have been exposed to hepatitis A. ISG works immediately upon administration, and the duration of protection is

several months. ISG usually is given to travelers to regions of the world where there are high rates of hepatitis A infection and to close or household contacts of patients with hepatitis A infection. ISG is safe with few side effects.

Hepatitis B immune globulin or HBIG (BayHep B), is human serum that contains antibodies to hepatitis B. HBIG is made from plasma (a blood product) that is known to contain a high concentration of antibodies to the hepatitis B surface antigen. If given within 10 days of exposure to the virus, HBIG almost always is successful in preventing infection. Even if given a bit later, however, HBIG may lessen the severity of HBV infection. The protection against hepatitis B lasts for about three weeks after the HBIG is given. HBIG also is given at birth to infants born to mothers known to have hepatitis B infection. In addition, HBIG is given to individuals exposed to HBV because of sexual contact or to healthcare workers accidentally stuck by a needle known to be contaminated with blood from an infected person

Hepatitis Vaccinations

Two hepatitis A vaccines are available in the US, hepatitis A vaccine (Havrix, Vaqta). Both contain inactive (killed) hepatitis A virus. For adults, two doses of the vaccine are recommended. After the first dose, protective antibodies develop in 70% of vaccine recipients within 2 weeks, and almost 100% of recipients by 4 weeks. After two doses of the hepatitis A vaccine, immunity against hepatitis A infection is believed to last for many years.

Individuals at increased risk for acquiring hepatitis A and individuals with chronic liver disease (for example, cirrhosis or chronic hepatitis C) should be vaccinated. Although individuals with chronic liver disease are not at increased risk for acquiring hepatitis A, they can develop serious (sometimes fatal) liver failure if they become infected with hepatitis A and, thus, they should be vaccinated.

Individuals at increased risk of acquiring hepatitis A are:

Travelers to countries where hepatitis A is common, Men who have sex with men, Illegal drug users (either injection or non-injection drug use), Researchers working with hepatitis A or with primates that are susceptible to infection with hepatitis A, Patients with clotting factor disorders who are receiving clotting.

Factor concentrates that can transmit hepatitis A

Some local health authorities or private companies may require hepatitis A vaccination for food handlers.

Because protective antibodies take weeks to develop, travelers to countries where infection with hepatitis A is common should be vaccinated at least 4 weeks before departure. The Centers for Disease Control (CDC) recommends that immunoglobulin be given in addition to vaccination if departure is prior to 4 weeks. Immunoglobulin provides quicker protection than the vaccines, but the protection is short-lived.

Hepatitis B

For active vaccination, a harmless hepatitis B antigen is given to stimulate the body's immune system to produce protective antibodies against the surface antigen of hepatitis B. Vaccines that are currently available in the U.S. are made (synthesized) using recombinant DNA technology (joining DNA segments). These recombinant hepatitis B vaccines, hepatitis B vaccine (Energix-B and Recombivax-HB) are constructed to contain only that part of the surface antigen that is very potent in stimulating the immune system to produce antibodies. The vaccine contains no viral component other than the surface antigen, and therefore, cannot cause HBV infections[48]. Hepatitis B vaccines should be given in three doses with the second dose 1 to 2 months after the first dose, and the third dose 4 to 6 months after the first dose. For the best results, the vaccinations should be given in the deltoid (shoulder) muscles and not in the buttocks. Hepatitis B vaccines are 95% effective in healthy adults. Five percent of vaccinated individuals will fail to develop the necessary

antibodies for immunity after the three doses. Patients with weakened immunity (such as HIV infection), older patients, and patients undergoing kidney hemodialysis are more likely to fail to respond to the vaccines.

Hepatitis B vaccine is recommended for:

All infants, Adolescents under 18 years of age who did not receive hepatitis B vaccine as infants, People occupationally exposed to blood or body fluids. Residents and staff of institutions for the developmentally disabled. Patients receiving kidney hemodialysis. People who with hemophilia and other patients receiving clotting factor concentrates, Household contacts and sexual partners of patients infected with hepatitis B chronically. Travelers who will spend more than 6 months in regions with high rates of hepatitis B infection. Injection drug users and their sexual partners. Men who have sex with men, men or women with multiple sex partners, or recent infection with a sexually transmitted infection, Inmates of long-term correctional facilities.

All pregnant women should have a blood test for the antibody to hepatitis B virus surface antigen. Women who test positive for hepatitis B virus (positive hepatitis B surface antigen) risk transmitting the virus to their infants during labor, and, therefore, infants born to mothers with hepatitis B infection should receive HBIG in addition to hepatitis B vaccine at birth. The reason for giving both immunoglobulin and vaccine is that even though hepatitis B vaccine can offer long lasting, active immunity, immunity takes weeks or months to develop. Until active immunity develops, the short-lived, passive antibodies from the HBIG protect the infant.

Unvaccinated individuals exposed to materials infected with hepatitis B (such as healthcare workers stuck by a contaminated needle) will need HBIG in addition to hepatitis B vaccine for the same reason as infants born to mothers with hepatitis B infection.

Hepatitis C and D

There is currently no vaccine for hepatitis C. Development of such a vaccine is difficult due to the six different forms (genotypes) of hepatitis C. No vaccine for hepatitis D is available. However, HBV vaccine can prevent an individual not infected with HBV from contracting hepatitis D because hepatitis D virus requires live HBV to replicate in the body[49].

What is the prognosis of viral hepatitis?

The prognosis of viral hepatitis for most patients is good; however, this prognosis varies somewhat depending on the infecting virus. For example, those patients who develop chronic hepatitis have a worse prognosis because of the potential to develop cirrhosis, liver failure, liver cancer (hepatocellular carcinoma), and occasionally death. Symptoms of viral hepatitis such as fatigue, poor appetite, nausea, and jaundice usually subside in several weeks to months, without any specific treatment. In fact, virtually all patients with acute infection with HAV and most adults (greater than 95%) with acute HBV recover completely. Complete recovery from viral hepatitis means that: the hepatitis virus has been completely eliminated from the liver, by the body's immune system, the inflammation in the liver subsides, the patient develops immunity to future infection with the same virus, and the patient cannot transmit the infection to others. Unfortunately, not all patients with viral hepatitis recover completely. Five percent of patients with acute HBV infection and about 60% of patients with acute HCV infection develop chronic hepatitis. Patients (about 0.5% to 1%) that develop fulminant hepatitis have about an 80% fatality rate. Chronic HCV infections are the leading cause for liver transplants. Because the liver works to detoxify substances, this task is compromised during acute and chronic viral hepatitis infections. Consequently, avoiding items that may stress the compromised livers function (for example, alcohol, smoking, taking drugs that require liver processing) should be strongly considered by the patient to improve their prognosis[50].

CONCLUSION

Ways hepatitis A is spread	**Course & outcome of infection**	**Vaccine or PEP**
Faecal-oral Faeces containing the virus are transferred to another person's mouth. Most infections in Australia are associated with: contaminated food, drink and eating utensils hands contaminated via contact with nappies, toys or towels soiled with faeces from an infected person oral / anal sexual contact sewage-contaminated water or shellfish travel to countries where hepatitis A is endemic (always present) Injecting and non-injecting drug use	Acute infection Symptoms occur in less than 10% of young children and 40 to 70% of adults who become infected. Chronic infection Does not occur in hepatitis A infection	Yes
Ways hepatitis B is spread	**Course & outcome of infection**	**Vaccine or PEP**
Blood-to-blood and sexual contact Most infections in Australia are associated with: immigration from a high prevalence country (where hepatitis B is more common) sharing injecting equipment unprotected sex mother-to-baby transmission at or around the time of birth child-to-child contact through open sores and wounds tattooing or body piercing household contact – sharing razors and toothbrushes receiving blood or blood products before screening from 1971	Acute infection Symptoms occur in up to 50% of adults in the period 2 to 3 months after infection. Chronic infection Develops in: 5 to 10% of people infected as adults 30 to 50% of children infected under 4 years of age 90% of infants infected in the perinatal period	Yes
Ways hepatitis C is spread	**Course & outcome of infection**	**Vaccine or PEP**
Blood-to-blood contact Most infections in Australia are associated with: immigration from a high prevalence country (a country where hepatitis Cis more common) sharing injecting equipment receiving blood or blood products before screening from 1990 tattooing, body piercing or acupuncture being a prisoner.	Acute infection 15 to 25% of people will develop symptoms which are usually mild and may include jaundice. Chronic infection 50 to 80% of people remain chronically infected. 25% of this group will develop scarring of the liver (cirrhosis) and some will develop liver cancer	No

Ways hepatitis D is spread	**Course & outcome of infection**	**Vaccine or PEP**
Blood-to-blood contact Most infections in Australia are associated with: immigration from a high prevalence country (a country where hepatitis B and D are more common) sharing injecting equipment	Acute infection In co-infection, acute hepatitis B and D occur simultaneously. Super infection occurs in people already infected with hepatitis B. Chronic infection More likely after super infection	Yes with hepatitis B vaccine
Ways hepatitis E is spread	**Course & outcome of infection**	**Vaccine or PEP**
Faecal-oral Faeces containing the virus are transferred to another person's mouth. Most infections in Australia are associated with travel to countries where hepatitis E is endemic (always present). Less commonly, infection can be passed from a pregnant woman to her fetus, or through infected blood transfusion.	Acute infection Symptoms are rare in young children. Disease is usually self-limiting with recovery but can be serious, particularly in pregnant women. Chronic infection Does not occur in hepatitis E infection	No

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