HEPATITIS - A VACCINE

Introduction

Hepatitis A is an acute infection of the liver caused by hepatitis A virus (HAV). Hepatitis A is usually a self-limiting viral illness that does not result in chronic infection or chronic liver disease. However, acute disease can vary in clinical severity from a mild illness to a severely disabling illness. Acute liver failure from Hepatitis A is rare.

Hepatitis A virus is transmitted from person to person, primarily by the faeco-oral route and is closely associated with poor sanitary conditions. In the long term, socioeconomic development will reduce transmission of hepatitis A, particularly through improved sanitation and health education.

Virology

Hepatitis A infection is caused by Hepatitis A virus (HAV), a non-enveloped RNA virus belonging to the family *Picornaviridae*. Humans are thought to be the only natural host.

Hepatitis A virus survives well in the environment. It is relatively stable at low pH levels and moderate temperatures. It can remain on a person's hands for several hours and in the environment for months, depending on conditions.

The virus can be inactivated by high temperature (85°C or higher), formalin, and chlorine.

Mode of transmission

Hepatitis A is transmitted primarily via faeco-oral route. The most common modes of transmission include close personal contact with an infected person and ingestion of contaminated food and water.

Clinical Features

The incubation period is approximately four weeks (range 15-50 days). Although replication of the virus is limited to the liver, the virus is present not only in the liver, but also in bile, stools and blood during the late incubation period and acute pre-icteric phase of the illness. Infection usually induces life-long Immunity.

All types of acute hepatitis show more or less the same kind of symptoms and signs, therefore, clinical features of acute hepatitis A are indistinguishable from those of other types of acute viral hepatitis.

Clinical spectrum of illness may vary from asymptomatic infection to symptomatic illness without jaundice (yellow discoloration of sclera and skin) or a classical icteric hepatitis. Rarely it is very severe and may be even fatal.

The occurrence of symptoms is commoner among adults than in infants and children.

Typical clinical symptoms include acute fever, malaise, anorexia, nausea, vomiting and abdominal discomfort followed a few days later by dark urine and jaundice.

A person is most infectious in the latter half of incubation period, and then infectivity wanes during the first week following onset of symptoms. Symptoms usually last several weeks, although up to 15% of cases may have relapsing hepatitis for up to 12 months. No carrier state or chronic sequelae has been identified after HAV infection.

Epidemiology

Global Situation

The incidence of hepatitis A is very much related to socioeconomic development. Sero-epidemiological studies have shown varying degrees of prevalence of anti-HAV antibodies in the general population ranging from 15% to nearly 100% in different parts of the world. In developed countries, the incidence of hepatitis A infection is on the decline, most probably due to improved sanitation and living conditions. In countries of low and intermediate disease endemicity, disease among adults is seen more often. Annual occurrence of clinical cases of hepatitis A is estimated to be around 1.5 million.

Sri Lankan situation

Hepatitis A is endemic in Sri Lanka, particularly in areas where sanitation is poor and access to safe water is an issue. Outbreaks from time to time have occurred in the past and they have mostly been confined to limited geographical areas. Several large outbreaks have been observed in recent times, largest being the one in welfare camps in Cheddikulam, Vavuniya during 2009. The total of 1496 clinically suspected hepatitis A cases were notified to Epidemiology Unit in the year 2010.

Hepatitis A vaccines

Four inactivated vaccines are available internationally. All four vaccines are similar in efficacy and safety.

None of the vaccines are licensed to be used for children below the age of one year. In countries where clinical hepatitis A is an important health problem, immunization is likely to be a cost-effective public health tool to control the disease.

Characteristics of the Hepatitis A Vaccines

- **Hepatitis A vaccine**

Four inactivated hepatitis A vaccines are currently available. The vaccines are given parenterally (IM), as a 2-dose series, 6-18 months apart.

Three vaccines are manufactured from cell culture adapted HAV propagated in human fibroblasts. Following purification from cell lysates, the HAV preparation is formalin-inactivated and adsorbed to an aluminium hydroxide adjuvant. One vaccine is formulated without preservative; the other 2 are prepared with 2-phenoxyethanol as a preservative. The fourth vaccine is manufactured from HAV purified from infected human diploid cell cultures and inactivated with formalin.

- **Hepatitis A & B combined vaccine:**

A combined inactivated hepatitis A and recombinant hepatitis B vaccine has been available since 1996 for use in children aged one year or older. The combination vaccine is given as a three-dose series, using a 0, 1, 6 month schedule.

Indications

Hepatitis A vaccine is indicated for adult and children over 1 year:

- persons who are at increased risk for hepatitis A infection,
- persons who are at increased risk for complications from Hepatitis A,
- control outbreaks.

  Use of hepatitis A vaccine to control outbreaks in communities has been most successful in small, self-contained communities, when vaccination is started early in the course of the outbreak, and when high coverage is achieved. Concomitant efforts for health education and improved sanitation should be coupled with vaccination strategies.

Those who may receive hepatitis A vaccine include:

- persons who have chronic liver disease of any aetiology who have not had Hepatitis A,
- Persons who frequently receive blood products including those having clotting-factor disorders,
- persons who have occupational risk for infection (persons who work with HAV in a research laboratory setting, persons who come in contact with faeces/ sewage),

- men who have sex with men,
- users of illegal injection and non-injection drugs,
- persons with intellectual disabilities,
- persons travelling to or working in countries/ areas of high or intermediate endemicity,
- at risk patients during the early stages of a hepatitis A outbreak.

Efficacy

Hepatitis A vaccines are highly immunogenic. Vaccine efficacy is shown to be nearly 100% among adults within one month after a single dose of vaccine, with similar results available for children and adolescents in both developing and developed countries.

Dosage & Administration

- **Hepatitis A vaccine**

  Manufacturers currently recommend two doses of vaccine, given intramuscularly (IM) adult and children over one year, 6-18 months apart to ensure long -term protection. The duration of protection is likely to be at least 20 years.

  From manufacturer to manufacturer, the vaccines may differ in the dose of vaccine to be given, vaccination schedule, ages for which the vaccine is licensed, and whether paediatric and adult formulations are available. Therefore, manufacturer's guidelines should be referred.

  Although different production methods are used and different strains and quantities of the HAV antigen are used for their respective vaccines, the 'equivalent' vaccines of different manufacturers are interchangeable.

  Hepatitis A vaccine may be administered concurrently with other vaccines

- **Hepatitis A & B combined vaccine:**

  The combination vaccine is given as a three-dose series, using a 0, 1, 6 month schedule for children aged more than 1 year and adults.

  The dose of vaccine, vaccination schedule, ages for which the vaccine is licensed, and whether there is a paediatric and adult formulation varying from manufacturer to manufacturer.

Storage

Hepatitis A vaccine should be transported and stored at +2°C to +8°C temperature. Do not freeze.

Contraindications

The following conditions are considered as contraindications for the use of hepatitis containing vaccine preparations.

- Presence of any of the general contraindications for any vaccine
- Anaphylaxis following a previous dose of hepatitis A containing vaccine
- History of anaphylaxis following any of the vaccine components

Combination vaccines containing the hepatitis B component are contraindicated where there is a history of anaphylaxis to yeast.
Neither pregnancy nor lactation is a contraindication for use of the vaccine.

Adverse Events

Adverse events, when they occur, are transient and minor. They include soreness at injection site, weakness, headache, disturbances of the gut such as nausea, vomiting, loss of appetite, diarrhea etc., malaise and fever. Reports of severe anaphylactic reactions are extremely rare.

Sources

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