Seroprevalence of hepatitis B & A virus infection in children (IgG & IgM)

Supervised by:

Prof.Dr.Burooj M.R. AL-aajem

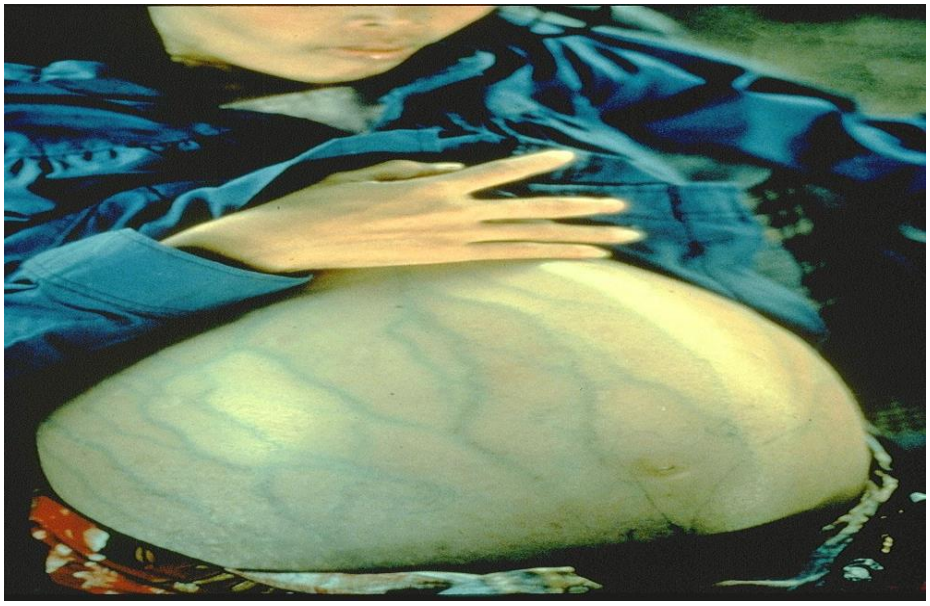
Presented by:

Bilal Sami Noori

Introduction

gastrointestinal One of the most common infectious diseases in the world, hepatitis is a sign of inadequate sanitization, particularly in rural and semi-urban areas. Recognizing this problem, governments around the globe established the National Viral Hepatitis Control Program, which includes, among other agents, the hepatitis E and hepatitis virus (HAV)[1]. One of the main agents that spreads orally is HAV, which causes 1.4 million new cases annually [2, 3].HAV is an RNA virus that is a member of the Picornaviridae family and genus Hepatovirus. Human serum anti-HAV antibodies can be found during acute sickness when fecal HAV shedding is still occurring and the serum liver enzyme level is high. IgM class antibodies are elevated at first and normally last for six to twelve months. Mostly the IgG class of anti-HAV arises in the later period (convalescence). HAV is a self-limiting illness that doesn't cause long-term effects [4]. A secure and efficient vaccination against HAV infection became accessible in the early 1990s. Hepatitis E virus (HEV), which is primarily present in Asia, portions of Africa, and central America, is another agent that is spread via sexual contact and is similar to HAV. It

is an RNA virus that belongs to the Hepevirus genus in the Hepeviridae family. Within six months of an acute infection, the anti-HEV IgM antibody levels drop to a very low level.[5] According to reports, 20–60% of instances of sporadic acute hepatitis with fulminant liver failure are caused by HEV. Pregnant women are shown to have a higher rate of HEV infection than do women with AVH who are not pregnant [5].



Figure(1):This women is suffering from liver cancer caused by hepatitis B

Age is the primary factor that determines how severe the condition is. In kids, it usually shows no symptoms at all or rather minor symptoms over time. But in the older age group, the course is more severe and the symptoms worsen [6, 7].Although HAV infection usually resolves on its own, it comes with a heavy financial cost.Hepatitis A patients miss several weeks of work or school and must pay for their own medical treatment[8].

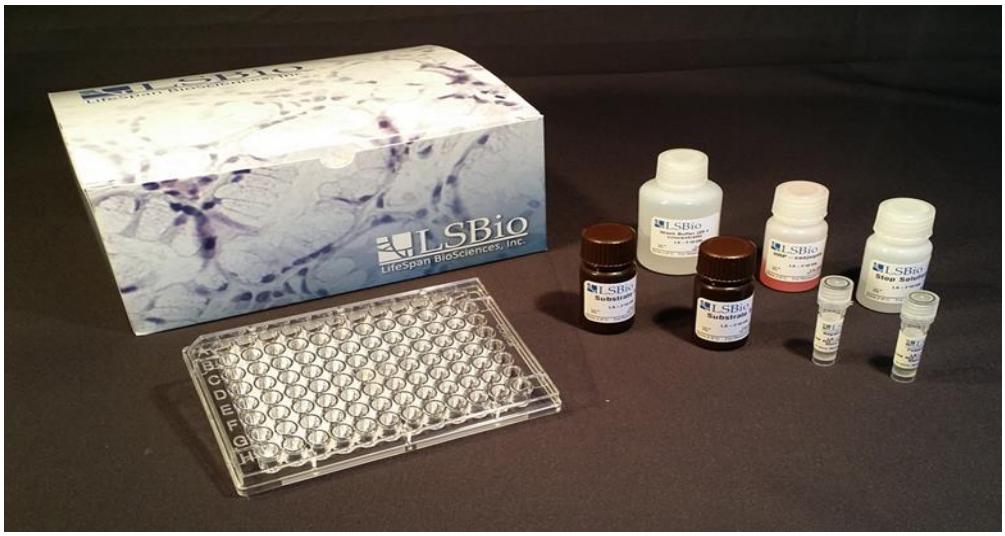
Infection with the hepatitis A virus (HAV) is the most common acute viral agent in the pediatric age range and a major global public health concern[9]. While the illness is present worldwide, emerging nations tend to have higher rates of it. The prevalence varies based on the community's socioeconomic status, the availability of clean water, congested living circumstances, and hygiene standards[10].

In Afghanistan, HEV was initially discovered in 1983[11]. It is the sole member of the Hepeviridae family's genus Herpesvirus and is a single-stranded, non-enveloped RNA[12]. One of the main causes of acute liver inflammation in the world is hepatitis E. The World Health Organization estimates that each year, 20 million HEV infections occur worldwide, resulting in 3.3 million cases of hepatitis E with symptoms [13, 14]. According to WHO estimates, 44,000 fatalities in 2015 were attributed to hepatitis E, or 3.3% of all deaths from viral hepatitis [23].

Most of these laborers often originate from areas where HEVs are particularly prevalent, such as Bangladesh, India, Pakistan, Pakistan, Egypt, and the Philippines. Anti-HEV IgG and IgM prevalence among blood donors from several of these nations has been demonstrated to be more than three times higher than that of the local population[15]. The risk of spreading acute hepatitis infection is higher in this population due to sharing housing, poor sanitation and hygiene, and growing evidence of direct person-to-person transmission of HEV, with households with multiple cases potentially accounting for nearly 80% of cases[16,17].

Hepatitis A is the most frequent cause of infectious hepatitis in children. Remembering other causes such as dengue, malaria, and typhoid fever is also

important. Acute infectious hepatitis presents with a non-specific and heterogeneous clinical appearance. Owing to inconsistent clinical manifestations, laboratory diagnosis, encompassing serology, becomes crucial for advancing the management of a hepatitis case[18]. Hepatitis is not ruled out even in the absence of icterus. Since prevention is always preferable to treatment, community sewage disposal, appropriate access to safe drinking water, and personal hygiene habits like washing your hands with soap and water can all help stop the spread of hepatitis A and E[19].Vaccination against hepatitis is highly advised. It's also critical to inform the public about the many etiologies and clinical manifestations of acute infectious hepatitis.



Figure(2):Human Anti-Hepatitis A virus antibody (IgG)

The fecal–oral mode of transmission is shared by HEV and HAV infections, which typically have low fatality rates. According to national studies, the incidence of HAV infection in Peru is high (98%) and varies significantly according on age and socioeconomic status [21, 24]. In contrast, significant prevalence rates of between 10.4% and 16% have been observed in isolated investigations of HEV

infection [26–28]. It is unknown, meanwhile, how common HEV infection is across the country and how it differs by area, age, sex, and ethnicity.

Much higher prevalence rates among those without an elementary education [30]. There were clear geographical variations in the prevalence of anti-HEV across all age categories, and these prevalence rates rose with age. Every individual who tested positive for HBsAg and anti-HCV also tested positive for anti-HAV. In contrast to HBsAg, which was less common among anti-HEV-positive individuals, anti-HAV IgG was very prevalent in this population [31]. Two participants tested positive for HBV, HCV virus, and HEV; one tested positive for HBsAg, VHD, and anti-HEV. educational levels as stated by Kilpatrick (92%) and Hernandez (37.4%). We also need to take into account the fact that, in contrast to Lima's metropolitan region, several portions of the city's peri-urban districts lack access to sufficient water and sanitary facilities[32].

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Hepatitis A seroprevalence has been discovered to be influenced by a number of variables. In instance, there is a substantial correlation between a decline in the incidence of HAV infection and subsequently reduced age-seroprevalence rates, particularly in children, and an increase in socioeconomic

indices such wealth and availability to clean water[41, 42]. Hepatitis A is thought to be very prevalent in Southern Africa, where seroprevalence is shown in children between the ages of 1-4 and 5-9[43].

Patients and Methods

The study begin from 3 on October 2023 to 2 on February 2024 this cross sectional, multi_center study was conducted at the Albatool Teaching Hospital and from private laboratories, were performed using data from patient, the collected data was 50 case, 35 case from Albatool Teaching Hospital and 15 case from private laboratories, the neonate from 1day to 28 day and infant from 1 month to 9months, all information was collected in questioners, which was attached at the 75 end of research. ELISA was used to evaluate the 20 hospital specimens that were obtained, utilizing the Architect i2000SR anti-HAV IgG and IgM assays (Abbott Diagnostics, Germany).

Results

Seroprevalence is shown for the following age cate-gories : 1–2 years, 3–4 years, 4–5 years, The age range of 1 to 2 years had the lowest seroprevalence (29.4%) At three to five years old, the anti-HAV IgM analysis findings showed the greatest positive rate.The anti-HAV IgM results were grouped into four categories—age 1–5 years. In the current study, acute hepatitis A infection peaked in the first five years (46.8% of all positive cases). There were up to 28.5% of cases in the 11–40 age range and 23.7% of cases in the 6–10 age group. Twenty individuals had anti-HAV IgM and anti-HAV IgG positive results.Of these patients, 42 were younger than 5 years old, 25 in the 6–10 age group, and 31 older than 11 years.

Table(1):Seroprovalence of patients according to Gender and Age group

Age Group	Number	Gender	Percentage
Newborn-mounth	5	Male:3 Female:2	6% 4%
6weeks-6 months	7	Male:4 Female:3	8% 6%
7 weeks- year	5	Male:1 Femal:4	2% 8%
1.5-2 years	8	Male:3 Female:5	6% 10%
2.5-3 years	7	Male:2 Female:5	4% 10%

3.5-4 years	**8**	**Male:5** **Female:4**	**10%** **8%**
4.5-5 years	**5**	**Male:2** **Female:3**	**4%** **6%**
Total Number	**50**		**100%**

Table(2):Rate of HEV,HAV and HE&HA between male and female

Gender	HEV	HAV	HE & HA
Male	12	7	19
Female	8	13	21
Total	20	20	40

Table(3):Positive result (IgG,IgM)in patients with HEV ,HAV and HE&HA

	HEV	HAV	HE & HA
IgG	Number:7	Number:13	Total:20

	Percentage:16%	**Percentage:18%**	**Percentage:100%**
IgM	**Number:11** **Percentage:13%**	**Number:9** **Percentage:10%**	**Total:20** **Percentage:100%**

Table(4):Seroprevalence of hepatitis B&A virus infection in different area

	City	**Countryside**
HEV	**7**	**13**
HAV	**11**	**9**
HE & HA	**20**	**20**

Discussion

The diagnosis of acute HEV infection is made by enzyme immunoassays that find antibodies against HIV (IgM, IgG, or both). A number of problems with HEV

serological assay performance need to be addressed immediately, including suboptimal assay specificity, cross-reactivity with other viruses (EBV and CMV), and the inadequacy of anti-HEV IgM as a stand-alone marker for diagnosis [44].

When diagnosing HEV infection in immunocompetent individuals, the European Association for the Study of the Liver (EASL) advises combining serology with nucleic acid test (NAT) testing; when diagnosing chronic HEV infection in immunocompromised patients, NAT testing is advised. The diagnosis of acute viral hepatitis cannot be reliably made using serology testing alone[45].

Many things work in favor of HEV spreading to people. The most prevalent ones are not cleaning utensils, washing hands together [47], and open defecation. [48]; storing water in containers with an open mouth[65]; eating roadside food [66]; and eating unwashed vegetables [46]. Zoonotic links of this disease have been documented. The people most at risk were those who had regular contact with animals such as domestic pigs and wild boars, which are the main reservoirs of the virus[49,50].The limited number of samples gathered in these areas as part of the YF monitoring program may account for the lack of hepatitis virus markers we found in these areas. There are extremely few mosquitoes and no instances of malaria in the area.[51]. The Sahelian zone exhibited a greater frequency of HEV infection (IgG and IgM positive) than the Sudanese zone, according to the distribution of HEV markers by geographical zone[52].

Acute hepatitis has several causes depending on the region and the infectious agents that are most common. According to this study, viral hepatitis A (48.3%), dengue fever (22.5%), and viral hepatitis E (12.4%) were the most common causes of acute hepatitis in children. Among the rare causes were

combined viral hepatitis A and E infection (2.2%), enteric fever (4.5%), septicemia (4.5%), and malaria (5.6%). This investigation did not find any cases of hepatitis B or C, in contrast to prior studies [56]. This could be due to a small sample size and several research carried out in various settings and in various places.

Seasonal pattern observed in Hepatitis virus[54]. Results show that rainfall acts as an indirect vector for HAV infections. Hepatitis A and E thus occurs seasonally as a result of disruptions in water and sanitation[55].

Conclusions

Most patients with unconjugated hyperbilirubinemia can be managed by a pediatric or neonatal practitioner; however, those who may be at risk for hyperbilirubinemia may require follow-up appointments and discussions with pediatric gastroenterologists, hematologists, and medical geneticists[55]. The earliest possible referral for patients suspected of having newborn cholestasis should be made to a pediatric gastroenterologist. The majority of these patients will require a series of tests, and additional referrals will be necessary after the cholestasis's cause is determined. For corrective surgery, infants with biliary atresia must also be sent to a pediatric gastrointestinal surgeon[56]. Patients with inborn errors of metabolism would need a consultation with a metabolic specialist as well as amedical geneticist and a Dietician experienced in metabolic disorders; Phototherapy is highly effective in reducing the serum bilirubin concentration in variables feeding patterns. Breast-fed neonates require longer

duration of phototherapy to decrease the bilirubin to safe levels. Breastfeeding is associated with decreased response to photo therapy[57].

In the last decades, a, sint of bench-based work has been performed to unravel bilirubin-induced neurototy Some "dogma" felllir sannd new knowledge raised new hypotheses that need to be experimentally and dinically explored by the "yello Now researchers".International, and multidisciplinary expertise will be the key to Success[58].Infantile jaundice is a common but potentially life-threatening condition.The differentintiation between medical and surgical causes shouldld be made early on by measuring the blood level offcoconjugated and unconjugated bilirubin. Laparoscopopy should be considered in any patient with persisistent cholestatic jaundice to exclude BA that requinires early intervention[59].