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Research Article

Hepatitis A Profile: Epidemiological, Clinical and Outcomes in Children's Welfare Teaching Hospital and the Need for Hepatitis A Vaccine Programme Setting

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Abstract:

Background: Hepatitis A virus, a single-stranded RNA virus from the family Picornaviridae, is primarily transmitted via the fecal-oral route. The World Health Organization reports annually, about 1.5 million hepatitis A cases, with the incidence rates closely linked to socioeconomic conditions. This vaccine-preventable disease is the focus of our research.

Objectives: The current research aimed to elucidate the incidence, clinical presentation, and outcomes of hepatitis A in Iraq, highlighting the importance of appropriate preventive measures.

Methods: It wasconducted as a retrospective cohort study from January 2019 to July 10, 2022, and a prospective cohort study from July 11, 2022, to September 30, 2022. A total of 238 confirmed HAV cases 189 retrospective and 49 prospective were analyzed. Data included demographic characteristics, clinical presentations, laboratory findings, and ultrasonographic results. HAV IgM positivity was confirmed using the MAGLUMI HAV IgM Chemiluminescent Immunoassay CLIA).

Results: Most cases were observed in the 6 to 10-year-old age group p=0). Gender distribution was nearly equal, with males at 50.8% and females at 49.2%. Clinical profiles included jaundice 96.2%), hepatomegaly 45.4%), abdominal distention 15.6%), splenomegaly 7%), and bleeding 5.9%). Ultrasound findings showed an enlarged liver 45.4%), thickened edematous gallbladder wall 31.2%), enlarged spleen 14.9%), and ascites 4.2%). Biochemical analysis revealed mean values of SGPT 786.8 U/l), SGOT 647.6 U/l), TSB 10.34 mg/dl), Alb 3.9 g/dl), PT 14.9 sec), PTT 36.45 sec), and INR 1.15). Severe cases were 8 in number, with acute liver failure 4 deaths) and 6 with hepatic encephalopathy 5 deaths), and a mortality rate of 2.1% of which the male-to-female ratio was 4:1.

Conclusion: This study underscores the need for vaccine implementation to prevent and control HAV infection in Iraq, given the high incidence and ongoing risks.

Keywords: ALF; Children's Welfare Teaching Hospital; Encephalopathy; HAV vaccine; Hepatitis.

Introduction

The term hepatitis is a general term that refers to inflammation of the liver. It can be caused by several types of viruses, such as Hepatitis A, B, C, D, and E (1). Hepatitis A, one of the oldest known diseases is characterized by fulminant liver disease (1). It is a self-limiting disease that can lead to morbidity and socio-economic losses (2,3). The first known example of this disease was identified in 1973 via an electron microscope. The HAV is a 27-nm, single-stranded, icosahedral, non-enveloped RNA virus from the genus Hepatovirus and family Picornaviridae. Although six

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The main transmission route is through the faecal-oral route. In childcare settings, the transmission of HAV usually occurs before the index case has been recognized e.g. a person with hepatitis A can shed the virus in their stool, beginning several weeks before the onset of symptoms. The viral concentration in the stool is at its highest in the prodromal phase). Since most children are asymptomatic or have nonspecific symptoms the incidence decreases with age, but the risk of manifested symptoms increases along with it (5,6).

The acute phase of the disease is characterized by four clinical phases although these do not occur in all patients). These phases are caused mainly by the responses of the immune system rather than by the

virus-induced cytopathology (6), and they include the incubation period which lasts for 10-50 days when the patient is asymptomatic,); the prodromal phase lasting a few days to more than a week, a period when the symptoms start appearing); the icteric jaundice) phase where jaundice appears, and the total bilirubin levels are higher than 20–40 mg/l); during this period, the patients frequently seek medical attention); and last, the convalescence period during which the disease progresses slowly, but the patient recovers completely and, mostly without incident). It is also possible for the patient to experience cholestatic hepatitis (7). Hepatitis A rarely exhibits extra-hepatic symptoms, and the condition eventually disappears. Occasionally, during the first six to eight weeks of sickness, the liver shows severe necrosis, the symptoms of fulminant liver failure or what is called Acute Liver Failure ALF), which in this case includes high fever, severe stomach pain, vomiting, jaundice, and the development of hepatic encephalopathy, which is accompanied by coma and convulsions and results in mortality in 70–90% of the patients (8). Pediatric Acute Liver Failure PALF) is defined as the acute onset of severe liver dysfunction plus the presence of liver-derived coagulopathy PT > 20 seconds or INR > 2.0, uncorrectable by parenteral administration of vitamin K in the absence of encephalopathy, or INR > 1.5 or PT > 15 seconds in the presence of hepatic encephalopathy. PALF-associated HAV occurs in 0.1-0.4% (8). Anti-HAV immunoglobulin M IgM) is the gold standard for the detection of acute illness, regarded as simpler, easier, and less expensive. IgM becomes positive at the time of symptom onset, peaks at the acute or early convalescent phase of the disease, and remains positive for approximately four months on average. Positive IgG antibodies without any clinical symptoms, indicative of a past HAV infection with persistent antibodies, asymptomatic infection, or a false positive test (9), while an IgG response that ideally follows the IgM response one week, typically persists for life; the durability of the IgG response may be limited in immunosuppression (2).

According to the World Health Organization, around 1.5 million cases of hepatitis occur globally each year (10). Several associated factors that may lead to this incidence include a low socioeconomic household status low income, wealth, and/or educational level), a larger household size and crowding, residence in a rural area, membership in certain ethnic groups, limited access to improved water sources and limited access to sanitation facilities. Although the low mortality associated with hepatitis A and the treatment are mainly supportive this does not imply that the disease is not severe. Infection may require several days or weeks of hospitalization and may result in absenteeism from school in children for example) for several weeks or months. Thus, infection can be expensive in terms of both direct medical costs and productivity loss (11). Many hepatitis A vaccines have been created since the successful growth of the HAV in cell culture, in 1979 and the strategy of Hep A vaccination varies in different countries. It includes vaccination among high-risk populations, regional childhood vaccination, and universal childhood vaccination. Overall, the incidence of hepatitis A has decreased greatly in many countries in the last 30 years, but the outbreaks frequently occur among high-risk populations and those who have not been covered by universal child vaccination programs in recent years (12). Currently, there are two distinct types of hepatitis Avaccines in use around the world:

- Formaldehyde-inactivated vaccines, which are made in several different nations are the ones globally most widely used.
- Live attenuated vaccines, which are produced in China and are available in many other nations, knowing that the minimal protective level of anti-HAV IgG was unknown until now. Serological cutoffs for the seroconversion rate differed widely between studies from 10 mI U/ml to 40 mI U/ml). Seroconversion of anti-HAV could be achieved after two doses of the vaccine among almost all children, irrespective of the manufacture of the vaccine (12). There are many countries in the Middle East and Northern African MENA) region that have high or extremely high levels of HAV endemicity, including Iran, Jordan, Lebanon, Morocco, Tunisia, Egypt, Iraq, Palestine, Syria, and Yemen (13).

Over the past few decades, a change in the HAV epidemiology in Saudi Arabia and Turkey is evident from a high to an intermediate endemicity pattern achieved and that is largely attributable to advancements in public healthcare policies, sanitation, education, and the implementation of childhood vaccination programmes in Saudi Arabia and Turkey, respectively, in 2008 and 2012 (14). Also, vaccinations lowered the mortality rate in the US, and the average rate dropped to 32% less in the recommended post-vaccination period than in the pre-vaccine period P-value=0.01) (15).

This study aimed to provide better understanding of the clinical presentation of hepatitis A and the outcomes of hepatitis A in our country. More important emphasizing the need to consider the appropriate preventive measures based on available data and statistics that we summarized in this research

Material and Methods

Sample collection: The target population in this research included all cases that were proved to be viral hepatitis A and attending in the Gastroenterology Inpatient and Outpatient if available) Department, of the Children's Welfare Teaching Hospital, from January 2019 to September 2022. The diagnosis of hepatitis A virus HAV) was based on the clinical, laboratory criteria and positive serology test HAV

IgM) as inclusion criteria while others with seronegative results have been excluded using MAGLUMI HAV IgM CLIA), which is used for detecting Hepatitis A Virus HAV) IgM antibody through a Chemiluminescent Immunoassay CLIA) method. The manufacturer is Shenzhen New Industries Biomedical Engineering in Shenzhen, China. The design of this research is a retrospective and prospective cohort analytical study, which depends on obtaining the information based on the questionnaire. This includes age, gender, residency, and outcomes of the disease, in terms of clinical manifestation, got better, not improved, patient Discharge Against Medical Advice or died). Descriptive statistics and Chi-squared tests to evaluate associations. The lab investigation and ultrasonography findings were obtained from patient files using the quota technique sampling method.

Sample size: The sample size of all the positive HAV patients, whose records were available and within the period cited above included 238 cases.

Statistical analysis: After collecting the data, analysis was done using the Statistical Package for Social Sciences SPSS) version 28.0), and descriptive data of the population investigated were presented in terms of absolute and relative frequencies. Continuous variables were presented as the mean, ± SD) and range. One sample Chi-squared test was used to measure the probability of occurrences of HAV related to age groups and gender, assuming equal distribution of the cases null hypothesis); *P*-values below 0.01 were considered of statistical significance. Using crosstabs two times) — once to find the probability of occurrence, other hepatitis viruses co-exist with HAV, and the second one to find the probability of pre-existing liver disease in cases of death, the overall mortality rates by age, gender, and residency were reported. *P*-values below 0.01 were considered statistically significant.

Results

The initial records were of 356 cases; however unfortunately, because of poor registry and documentation, only 238 cases which had been confirmed with hepatitis A during the period cited which includes nearly 4 years of records) have been found. We noticed that the incidence is not uniform i.e. regular increase or decrease, or static). In 2019 the number of cases was 34, which dropped to 22) cases in 2020 and then dramatically increased over the following years. In 2021, it rose to 89 cases and then to 93 cases during the first nine months of 2022. Figure **1**).

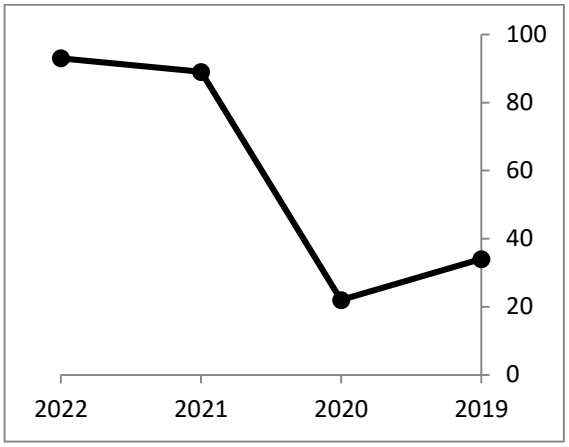

Figure 1. Records of the years of distribution of HAV infections were taken from the Children's Welfare Teaching Hospital.

Demographic characteristics of patients investigated

Related to the age group, the mean ±SD) age was 7.12 ±3.2) years, in the range of 2 months to 14 years. Furthermore, the occurrences of HAV were not equal, with the highest being observed in the 6-10years age group and the lowest in the 11- 14years age group *P*=0). Regarding gender, the occurrences were almost equal for both genders *P* = 0.795). Regarding residency, we noted that Al-Sadr city experienced the highest incidences 58 cases) from 192 total cases in Baghdad. The remaining cases were in the other governorates; 46 cases 21 of which were from Wasit. **Table 1)**.

Table 1. Incidence and mortality rate according to the gender of patients studied

Demographic characteristics		Number %)	*P*-value	Mortality %)
Gender	Male	12150.8%)	0.795	4 3.3%)
	Female	11749.2%)		1 0.8%)

Clinical findings: From the data records available, the most frequent clinical manifestation was observed to be jaundice in 229 96.2%) cases, whereas the least common one was bleeding, seen in 14 5.9%) cases.

The occurrence of hepatomegaly was 43 33.5%) which was considered relatively low because of poorly registered cases in medical records); abdominal distention was seen in 20 15.6%) cases; splenomegaly in 9 7%) cases; and other less frequent findings like pallor, no bowel motion and epigastric tenderness in a negligible number of cases. Out of 169 patients which data, to detect encephalopathy and acute liver failure, where available, 8 4%) had acute liver failure ALF), among them, 4 patients with ALF passed away and there were 6 2.5% out of 169 cases) cases of encephalopathy **Figure 2)**.

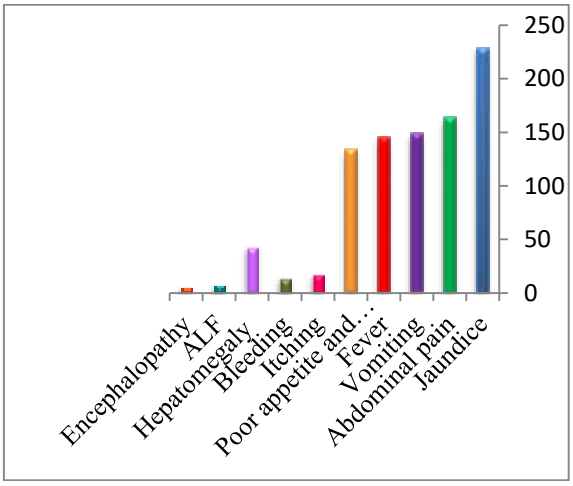

Figure 2. Prevalence of clinical findings among the patients studied.

Investigation findings: Ultrasound imaging of the available 141 records) showed that the most frequent findings were enlarged liver in 64 45.4%) cases, thick edematous wall of the gallbladder in 44 31.2%), enlarged spleen in 21 14.9%) cases, ascites in 7 4.9%) cases and other less frequent symptoms including LAP, free fluid in the pelvic region, atrophied gallbladder, etc. Liver function tests LFTs), regarding the liver enzymes, mean ±SD); SGPT was 786.8±674.5) U/dl, SGOT was 647.6±697.6) U/dl and ALK was 426.1±498) U/l **Figure 3)**.

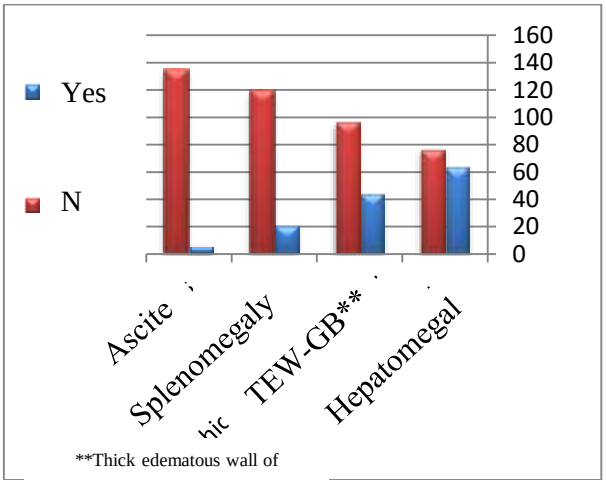

Figure 3. Prevalence of sonographic signs in children with HAV.

Total serum bilirubin TSB) mean ±SD) was 10.34 ±8.14) mg/dl. Albumin Alb) mean ±SD) was 3.9 ±2.21) g/dl. PT and PTT means ±SD) were 14.9 ±5.4) sec and 36.45 ±10.3) sec, respectively, INR mean ±SD) was 1.14±0.42). **Table 2).**

Table 2. Lab investigation mean, SD and range) of patients studied

Lab Investigation	Mean	±SD	Range
SGPT U/l)	786.8	674.5	20 – 4670)
SGOT U/l)	647.6	697.6	16 – 4880)
ALK U/l)	426	498	4.04 – 6200)
TSB mg/dl)	10.34	8.14	0.2 – 44)
Alb g/dl)	3.9	2.21	1.5 – 24.2)
PT sec)	14.9	5.4	9.4 – 60)
PTT sec)	36.45	10.3	10 – 120)
INR	1.15	0.42	0.72-4.62)

Abbreviations: SGPT: serum glutamic-oxaloacetic transaminase. SGOT: serum glutamic-pyruvic transaminase. ALK: alkaline phosphatase. TSB: total serum bilirubin. PT: prothrombin time. PTT: partial thromboplastin time. INR: International normalized ratio. Alb: albumin.

Other diseases associated with HAV: All 238 patients had HAV-positive serology, and one of these had HBV +ve serology) as well, while the other one had HEV +ve serology); both cases occur in the less than 5-year age group. Also, we found 4 patients who had preexisting liver disease i.e. acute liver failure, chronic liver disease, Niemann-Pick, and liver cirrhosis).

Mortality: The mortality rate was 2.1%), and five deaths were recorded. Related to the age groups: the groups of five years and under, and the 10-14 years groups showed an equal mortality rate of 2.3%, while the 6-10 years group had 1.8% **Table-3).** Related to gender, we find that the mortality rate was 3.3% in males, while it was 0.8% in females. This means the male-to-female ratio was 4:1) **Table 1)**. In terms of residency, three deaths were observed in Baghdad Al-Sadr city and one death in each Baghdad Al-Zafarania and Wasit. Regarding the complications, four deaths revealed an enlarged liver on ultrasonography, one death had pre-existing chronic liver disease, and all five deaths showed hepatic encephalopathy. The mean value of the TSB was 15.58 mg/dl, SGPT was 372 U/l, SGOT was 593.6U/l, and the SGOT/SGPT ratio was ≥ 1, except for one case, with ALK 197.8 U/l) and Alb 2.6 g/dl). Lastly, the mean values of PT and PTT were 32.6 sec and 65.2 sec, respectively; INR was ≥1.5.

Table 3. Incidence and mortality rate according to age of patients studied

Demographic characteristic		Number %)	*P*-value	Mortality %)
Age	≤ 5years	8535.7%)	0.00	2 2.3%)
	6	11146.6%)		2 1.8%)
	11-14years	4217.6%)		1 2.3%)

Discussion

In the Middle East and Northern African regions, several countries, such as Iran, Jordan, Lebanon, Morocco, Tunisia, Egypt, Iraq, Palestine, Syria, and Yemen have high or very high levels of HAV endemicity (13). As shown in Figure 1, less numbers

of Hepatitis A cases were reported in 2020 in the Children's Welfare Teaching Hospital, and this is consistent with the report from the Chicago Department of Public Health which found that "as the healthcare provider focuses activities on COVID-19 cases and transition to telehealth visits; A decrease in both testing for and reporting of new hepatitis A cases was observed (16). Also, another study from the CDC showed that because a curfew was applied, restaurants shut down, people stayed home, and more awareness was raised regarding proper hygiene and sanitation. This caused a temporary cut down in the transmission of infections (17).

In the present study, the highest incidence was observed in age 6-10) years old (*P*=0), as seen in **Table 3)**. A similar study was done at Al-Elwiya Pediatric Teaching Hospital in Baghdad, where 69.55% of HAV infections were observed in the 5-10years group their age group deviation was slightly different) (18); another study from Mosul city (19) and Karbala (20), which confirms these results. One study from Turkey shows that the vaccine not only reduces the incidence of HAV infection but the mean age of presentation may get moved up to the adolescent group, with a decline in the morbidity and mortality rates in the younger age groups (21). Regarding the gender-incidence correlation; the present study showed that the correlation was not significant *P*=0.795), while many other studies suggested a correlation between gender and incidence — for example, a study from Egypt considered the HAV infection as one of the 'Gender gap diseases', which means that because of the differences in the social, political, intellectual, cultural, or economic attainments that prevail; or attitudes between males and females; the number of males infected with hepatitis A in most of the Egyptian governorates is more than females (22). The male ratio in our study was 50.8%; as mentioned earlier this is not reliable data, because in the initial medical records, the male percentage was 64.3%. This may not concur with the hypothesis of 'Gender gap diseases'. Another study in South Korea also suggested that the incidences are more in the male gender (23). In terms of the residency-incidence correlation, the highest incidence was in Al-Sadr city, as cited earlier 58 cases); for a while these appear logical and may be due to the facts that Al-Sadr city is one of the most crowded areas in Baghdad, having several unlicensed restaurants. Further, certain regions have limited access to sanitation facilities, as well as pure water sources and large household sizes. Another study that includes a socio-demographic index suggests that poor sanitary and hygienic conditions were contributors to the propagation of HAV in low-income regions; other factors included household crowding, poor sanitation levels and inadequate water supply compared with the high-income or even middle-income regions (24). On the contrary, A study done in Duhok governorate shows a decline in HAV infections in the past decade attributing this to the improvements in sanitation and access to clean water (25). Wasit reported the highest incidence among the governorates, apart from the factors cited above, the location of Wasit near Baghdad) may be the reason for referring most of the cases. Jaundice 96.2%) is the commonest clinical manifestation and hepatomegaly 33.5%) is the commonest sign on examination, consistent with the findings of a study from the USA that shows similar results: jaundice 71%) and hepatomegaly 78%) (26). Ultrasonography findings, **Figure 3**); hepatomegaly 45.4%) and thick edematous wall of the gallbladder 31.2%) were at the top of the findings. A study from Pakistan showed that the thick edematous wall of the gallbladder occurred in 82.9%, followed by hepatomegaly in 59.5% (27). In general, these two findings are frequently encountered. LFTs, **Table 2;** the highest elevation was recorded for the SGPT followed by SGOT and then ALK. This sequence is similar to the study done at Huntington Memorial Hospital, which was linked to a prolonged recovery time, the probability of relapsing, and prolonged cholestasis (26). The maximum peak for the TSB was identified 44 mg/dl) and in many patients it was high; therefore, the mean was 10.34 mg/dl), from this point, a study that was done on hospitalized patients(28), suggests a significant trend of rising hospital mortality with a heightened grade of hyperbilirubinemia as a result of the potential liability for extraordinary presentations e.g. prolonged cholestasis and elevated liver enzyme level); also, the study shows that serum bilirubin is considered, at present, a stable and powerful marker of hepatic dysfunction, more than the others hepatic encephalopathy, ascites, or elevated liver enzymes). The mean Alb level was 3.9 g/dl) with six cases 2 from death) which had an Alb level below 2.5 g/dl; a clinically significant level of hypoalbuminemia). A study showed that hypoalbuminemia was associated with an increased risk of acute liver failure ALF) in patients with acute hepatitis A (29). The mean PT and PTT levels were 14.9 sec, and 36.45 sec). A study shows that as the mean level of PT and PTT increased, the severity and the incidence of ALF increased, as well (30). A study shows that the serum proteins, especially albumin and prothrombin time, are recognized laboratory parameters of biosynthetic liver functions. A significant decrease in the serum albumin and prothrombin time prolongation in cases of the ascitic acute viral hepatitis AAVH) group is indicative of more severe hepatic injury when compared with the non-ascitic acute viral hepatitis NAVH) (31). This is exactly true for the albumin and PT of the cases who ended with death, in which the mean values were 2.6 g/dl and 32.6 sec, respectively, but because of the missing dataset, the 7 cases of ascites had unknown

albumin and PT levels. Acute liver failure ALF) was seen in 8 cases 4%; 8 cases out of 169 available records of the INR & encephalopathy). A study shows that ALF occurs in a negligible percentage of 0.1-0.4%), although HAV is a self-limiting disease; but post-ALF complications usually occur specifically in poor and economically deprived children because they tend to develop complications caused by the delay in referral or visits to healthcare centers so that the vaccination guidelines against hepatitis A virus can be reviewed and expanded, thus favoring general immune prophylaxis to prevent the occurrence of ALF and its subsequent complications (32). Regarding other positive viral hepatitis serology, as mentioned earlier, one case had HEV 0.4%) the other one had HBV 0.4%) however, both survived). Two cases were observed in the age group ≤5 years; a study showed that the highest prevalence of HAV-HEV co-infection increased with age, mostly at 6-10 years of age (33), while the HAV-HBV co-infection occurred mostly in the age group 3-6 years (34). Our study shows that four children had pre-existing liver disease i.e. acute liver failure, chronic liver disease, Niemann-Pick, and liver cirrhosis). A similar study done in Japan showed that the presence of liver disease especially the chronic type) in a patient then had an acute infection like HAV); acute chronic liver disease ACLD) which could lead to liver failure and favor mortality, so vaccination against HAV for patients with such risks is very necessary (35). Mortality: The mortality rate was 2.1%; five deaths, related to the age groups were observed; the groups ≤5) years and 11-14) years showed an equal mortality rate of 2.3%; while the age group 6-10 years had a rate of 1.8% **Table 3).** A similar study done in the Children's Welfare Teaching Hospital showed that the mortality rate with age was as follows: for children ≤ 5 years it was 10.1% 7 cases); for children 6-10 years there was only one death and for children in the age group 11-18 years there were only two recorded deaths (36). The mortality rate among males is four times the rate among females, according to a study done in the USA, where they observed that the mortality rate among males was six times more than the rate among females (37). In terms of the mortality-residency correlation — 3 cases out of 5 were in Al-Sadr city because the incidence is high when compared with the other regions. A study showed that children who live in poor economic regions tend to develop complications because of delays in referral, or visits to healthcare centers (32). Our records showed no significant difference in the clinical presentation of death in children compared with the ones alive, except for signs of hepatic encephalopathy e.g. abnormal tonic movement, rolling of the eyes, confusion, and coma), which manifested later during the advanced stages of the disease. The same study showed that sometimes HAV infection could lead to severe acute liver failure ALF), which in turn induced hepatic encephalopathy as one of its complications (32); we noticed that four out of the five children who died had INR ≥1.5) associated with signs of hepatic encephalopathy. Our study also shows that the SGOT/SGPT ratio was≥ 1), except for one case. A study stated that the SGOT/SGPT ratio in acute viral infection most often is less than one because the SGPT level is higher than the SGOT; however, occasionally the HAV caused this ratio to rise above one, suggesting acute liver failure with poor prognosis. The study considered pre-existing liver diseases as a major factor that contributed to mortality (37). However, in our study, four out of the five cases of patient death had no pre-existing liver diseases, and all the cases of death showed negative serology tests for HBV, HCV& HEV.

Limitations

Poor registration of findings: We faced a problem where some important findings were not registered in the files of the patients, so some of the numbers can slightly deviate from reality.

Missing files: We had no access to the number of files that were supposed to be included in our research because they were transported from their primary storage location i.e. the Department of Statistics and Medical Records of the Children's Welfare Teaching Hospital) and we couldn't track to where were they transported.

Conclusions

HAV Infectivity in Iraq keeps its continuity with a variety of presentations from self-limiting cases to life-threatening cases and even death. Death from HAV infection can occur even if the initial symptoms are mild and no significant pre-existing liver damage in terms of chronic disease or hepatic injury. With the presence of a low socioeconomic improvement and the absence of the HAV vaccine program in Iraq, a future decline is not expected, however, given that the improvement in the socioeconomic status takes greater time and requires many facilities. Further, the need for the HAV vaccine continues to rise.

Recommendations

1. Actions from the government to improve the sewage and water systems need to be implemented, as well as restrictions on sanitization in restaurants.
2. Accurate Statistical data and registration of the HAV cases to have a realistic estimation concerning the endemicity in the country.
3. We can use the findings of neighboring countries which implemented the Childhood HAV vaccination program, and thus build a perfect strategy, suitable for Iraq. The strategy for controlling hepatitis should include preventive and treatment measures. Increasing immunization, and increasing access to treatment are the basic needs.
4. Greater awareness is a crucial need in Iraq, as many parents prefer not to bring their children to the hospital if symptoms do not appear to be very serious; however, death is still a very real risk factor, as discussed. Spreading awareness about prevention methods is important as well.

Authors' Declaration

we confirm that the figures and tables in the manuscript belong to the current study. Besides, for the figures and images which do not belong to the current study, permission for re-publication has been granted and is attached to the manuscript. The authors have signed on the ethical consideration approval for
Ethical clearance was not necessary as neither photographs nor identifiable information regarding the patients has been included.

Conflict of interest: None
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Authors' Contributions:

All the authors contributed to data collection and analysis. They all participated in the writing, editing, and reviewing of the manuscript.

References

1. Odenwald MA, Paul S. Viral hepatitis: Past, present, and future. World J Gastroenterol. 2022 Apr 14;2814):1405-1429.PMID: 35582678; PMCID: PMC9048475.Hollinger FB, Liang TJ. Hepatitis B virus. Fields virology. Lippincott Williams & Wilkins, Philadelphia. 2017:2971-3036.https://doi.org/10.3748/wjg.v28.i14.1405.

2. Abutaleb A, Kottilil S. Hepatitis A: Epidemiology, Natural History, Unusual Clinical Manifestations, and Prevention. GastroenterolClin North Am. 2020 Jun;492):191-199. Epub 2020 Mar 29. PMID: 32389358;PMCID:PMC7883407.https://doi.org/10.1016/j.gtc.2020.01.002.

3. Aggarwal R, Goel A. Hepatitis E: current status in India. Clin Liver Dis Hoboken). 2021;183):168-172. https://doi.org/10.1002/cld.1040PMid:33163170 PMCid:PMC7609704

4. Pérez-Sautu U, Costafreda MI, Caylà J, Tortajada C, Lite J, Bosch A, Pintó RM. Hepatitis a virus vaccine escape variants and potential new serotype emergence. Emerg Infect Dis. 2011 Apr;174):734-7. Https://doi.org/10.3201/eid1704.101169. PMID: 21470474; PMCID: PMC3377408.

5. Nelson NP, Weng MK, Hofmeister MG, Moore KL, Doshani M, Kamili S, Koneru A, Byrd KK. Prevention of hepatitis A through active or passive immunization: Recommendations of the Advisory Committee on Immunization Practices, United States, 2020. MMWR Recomm Rep. 2020;69No. RR-5):1-38. https://doi.org/10.15585/mmwr.rr6905a1. PMid:32614811 PMCid:PMC8631741

6. Gabrielli F, Alberti F, Russo C, Cursaro C, Seferi H, Margotti M, Andreone P. Treatment Options for Hepatitis A and E: A Non-Systematic Review. Viruses. 2023 Apr 28;155):1080. Https://doi.org/10.3390/v15051080. PMID: 37243166; PMCID: PMC10221699.

7. UFallucca A, Restivo V, Sgariglia MC, Roveta M, Trucchi C. Hepatitis a Vaccine as Opportunity of Primary Prevention for Food Handlers: A Narrative Review. Vaccines Basel). 2023 Jul 21;117):1271. Https://doi.org/10.3390/vaccines11071271. PMID: 37515087; PMCID: PMC10383099.

8. Dhawan A, Cheeseman P, Mieli-Vergani G. Approaches to acute liver failure in children. Pediatr Transplant. 2020;244):e13678.https://doi.org/10.1111/petr.13678 PMid:32343885

Castaneda D, Gonzalez AJ, Alomari M, Tandon K, Zervos XB. From hepatitis A to E: A critical review of viral hepatitis. World J Gastroenterol. 2021 Apr 28;2716):1691-1715. Https://doi.org/10.3748/wjg.v27.i16.1691. PMID: 33967551; PMCID: PMC8072198.

9. Migueres M, Lhomme S, Izopet J. Hepatitis A: Epidemiology, High-Risk Groups, Prevention and Research on Antiviral Treatment. Viruses. 2021;1310):1900. doi:10.3390/v13101900 https://doi.org/10.3390/v13101900 PMid:34696330 PMCid:PMC8540458

10. Langan RC, Goodbred AJ. Hepatitis A. Am Fam Physician. 2021 Oct 1;1044):368-374. PMID: 34652109.

11. Zhang L. Hepatitis A vaccination. Hum VaccinImmunother. 2020 Jul 2;167):1565-1573. Epub 2020 Jul 10. PMID: 32649265; PMCID:

PMC7482852.https://doi.org/10.1080/21645515.2020.1769389

12. Abu-Raddad LJ, Ayoub HH, Chemaitelly H, Mumtaz GR, Butt AA, May MT, Hallett TB. Characterizing the Epidemiology of Hepatitis A in the Middle East and North Africa: Implications for Vaccination Strategies. Journal of Infection and Public Health. 2021;144):409-420. https://doi.org/10.1016/j.jiph.2021.01.002PMid:33743368PMCid:PMC7834000

13. Badur S, Öztürk S, Ozakay A, Khalaf M, Saha D, Van Damme P. A review of the experience of childhood hepatitis A vaccination in Saudi Arabia and Turkey: implications for hepatitis A control and prevention in the Middle East and North African region. Human Vaccines &Immunotherapeutics. 2021 Oct 3;1710):3710- 28. https://doi.org/10.1080/21645515.2021.1920871 PMid:34213403 PMCid:PMC8437515

14. Foster MA, Hofmeister MG, Xing J, et al. Declining hepatitis A mortality in the United States during the era of hepatitis A vaccination. Journal of Infectious Diseases. 2021;2239):1450-1459. https://doi.org/10.1093/infdis/jiab046 PMid:35238363 PMCid:PMC8892529

15. Chicago Department of Public Health. Hepatitis A Response and Immunization Program. *Chicago Health Reports*. 2021;Issue 7:45-50. Available at:https://www.chicagohan.org/documents/14171/93622/Hepatitis_A_10242017

16. Centers for Disease Control and Prevention CDC). Hepatitis A Surveillance Report. *CDC Annual Reports*. 2021. Available at: https://www.cdc.gov/hepatitis/statistics/2021surveillance/hepatitis-a.htm

17. Hussein HK. Three years epidemiological study of acute hepatitis A infection in Al Elwyia pediatric teaching hospital, Baghdad, Iraq. Rawal Medical Journal. 2019 Oct 8;443):436-.

18. Daood II, RH I. Seroprevalence of Hepatitis A Virus HAV) in Mosul City. Medico Legal Update. 2020 Jan;201):310-4.

19. AA Darwish L, Nasrallah AA, Al Mousaw A. Hepatitis A in Kerbala: Eight Year Epidemiological Study. Kerbala Journal of Medicine. 2018 Jun 1;111):3873-83.

20. Akman AÖ, Burhan BY, Uzun AK, Taş D. Hepatitis A virus age-specific seroprevalence after the implementation of a Toddlers' Vaccination in Turkey: Shifting susceptibility to adolescents. Turk PediatriArs. 2020 Dec 16;554):370-375. https://doi.org/10.1016/j.sbspro.2011.05.114PMID: 33414654; PMCID: PMC7750331.

21. Elsabawy MN. Hepatitis gender gap in Egypt: A study in medical geography. Procedia-Social and Behavioral Sciences. 2018 Jan 1;19:121-30.https://doi.org/10.1016/j.sbspro.2011.05.114.

22. Choe YJ, Son H. The changing gender differences in hepatitis a incidence in South Korea. Vaccine. 2020 Jan 22;384):712-4. https://doi.org/10.1016/j.vaccine.2019.11.048 PMid:31787416

23. Cao G, Jing W, Liu J, Liu M. The global trends and regional differences in incidence and mortality of hepatitis A from 1990 to 2019 and implications for its prevention. Hepatol Int. 2021 Oct;155):1068-1082.. Epub 2021 Aug 3. PMID: 34345993; PMCID: PMC8514357.https://doi.org/10.1007/s12072-021-10232-4

24. Abdullah I; Goreal A. Seroprevalence of anti-hepatitis A virus antibody in Iraq. East Mediterr Health J. 2022;2811):829–834. https://doi.org/10.26719/emhj.22.087

25. Tong MJ, el-Farra NS, Grew MI. Clinical manifestations of hepatitis A: recent experience in a community teaching hospital. J Infect Dis. 1995 Mar;171Supplement_ 1:S15-8. https://doi.org/10.1007/s12072-021-10232-4. PMID: 7876641.

26. Arooj S, Mukhtar MU, Abbas F. An acute viral hepatitis epidemic: does ultrasound help the pediatrician? BMC Res Notes. 2021 Mar 10;141):95. https://doi.org/10.1186/s13104-021-05510-1. PMID: 33691769; PMCID: PMC7944630.

27. Han HS, Park CM, Lee DS, Sinn DH, Gil E. Evaluating mortality and recovery of extreme hyperbilirubinemia in critically ill patients by phasing the peak bilirubin level: A retrospective cohort study. PLoS One. 2021Aug5;168):e0255230. https://doi.org/10.1371/journal.pone.0255230. PMID: 34351969; PMCID: PMC8341602.

28. Jiang AA, Greenwald HS, Sheikh L, Wooten DA, Malhotra A, Schooley RT, Sweeney DA. Predictors of acute liver failure in patients with acute hepatitis A: an analysis of the 2016-2018 San Diego county hepatitis A outbreak. InOpen forum infectious-diseases 2019 Nov Vol. 6, No. 11, p. ofz467). US: Oxford University Press. https://doi.org/10.1093/ofid/ofz467 PMid:31777757 PMCid:PMC6868431

29. Anand AC, Nandi B, Acharya SK, et al. Indian National Association for the Study of the Liver Consensus Statement on Acute Liver Failure Part 1): Epidemiology, Pathogenesis, Presentation and Prognosis. J Clin Exp Hepatol. 2020 Jul-Aug;104):339-376. Epub 2020 Apr 28. PMID: 32655238; PMCID: PMC7335721.https://doi.org/10.1016/j.jceh.2020.04.012

30. van Lennep M, Leijdekkers ML, Oors JM, Benninga MA, van Wijk MP, Singendonk MM. Clinical experience with performing esophageal function testing in children. Journal of pediatric gastroenterology and nutrition. 2021 Feb1;722):226-31. https://doi.org/10.1097/MPG.0000000000003000 PMid:33230070 PMCid:PMC7815250

31. Hrynkiewicz R, Niedźwiedzka-Rystwej P. Etiology of viral induced acute liver failure and defensins as potential therapeutic agents in ALF treatment. Front Immunol. 2023 Apr 21;14:1153528. doi: 10.3389/fimmu.2023.1153528. PMID: 37153560; PMCID:PMC10160486.https://doi.org/10.3389/fimmu.2023.1153528
PMid:37153560 PMCid:PMC10160486
32. Naher B, Islam R, Ghosal S, Nahid KL. Rukunuzzaman 2021) Seroprevalence and Co-infection of Hepatitis A and Hepatitis E Viruses in children-A hospital-based study in Bangladesh. J NeonatolClinPediatr 8: 080. of.;4:2.
33. Escobedo-Meléndez G, Fierro NA, Roman S, Maldonado-González M, Zepeda-Carrillo E, Panduro A. Prevalence of hepatitis A, B and C serological markers in children from western Mexico. ANNALS of Hepatology. 2012 Mar
34. https://doi.org/10.1016/S1665-268119)31024-5.
*35. Kanda T, Sasaki R. Hepatitis A Infection in Patients with Chronic Liver Disease: Clinical Outcomes and Management. *Int J Mol Sci*. 2022;233):1267.*
https://doi.org/10.3390/ijms23031267
PMid:35163190 PMCid:PMC8836203
36. Thejeal RF, Abdulwahhab SB, Bahlol AR. Epidemiological study of hepatitis A infection, experience of children welfare teaching hospital: One-year analysis. EurAsian Journal of BioSciences. 2020 Aug 1;142): 6673-6677
37. Hofmeister MG, Xing J, Foster MA, et al. Hepatitis A person-to-person outbreaks: epidemiology, morbidity burden, and factors associated with hospitalization—multiple states, 2016–2019. J Infect Dis. 2021 Feb 1;2233):426-34. https://doi.org/10.1093/infdis/jiaa636

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نبذة عن التهاب الكبد A: الوبائية والسريرية والنتائج في المستشفى التعليمي لرعاية الأطفال والحاجة إلى إعداد برنامج لقاح التهاب الكبدA

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الخلاصة:
خلفية البحث:فايروس التهاب الكبد هو فايروس الحمض النووي الريبي احادي الجديلة ، عشيريني الوجوه، غير مغلف، ينتمي الى جنس ال فايروسات الكبدية من عائلة الفايروسات البيكارناوية. وينتقل بشكل رئيسي عن طريق البراز والفم. ووفقا لمنظمة الصحة العالمية، هناك حوالي ١,٥ مليون حالة من التهاب الكبد نوع أ على مستوى العالم كل عام. ترتبط الظروف الاجتماعية والاقتصادية ارتباطا وثيقا بمعدلات الإصابة، فهو مرض يمكن الوقاية منه باللقاحات. يوضح بحثنا حجم التهاب الكبد أ في المستشفى التعليمي لرعاية الأطفال/ مدينة الطب.
الاهداف :يهدف بحثنا الى توفير المعلومات الصحيحة والكافية لفهم الاعراض السريرية ونتائج التهاب الكبد أ في بلدنا. والاهم من ذلك، التأكيد على الحاجة الى النظر في التدابير الوقائية المناسبة بناءا على البيانات والإحصاءات المتاحة التي لخصناها في هذا البحث.
المرضى وطرق العمل/ المواد وطرق العمل:أجريناداسة تحليلية حشدية رجعية من الفترة كانون الثاني/٢٠١٩ الى ١٠/ تموز/٢٠٢٢ مع دراسة حشدية مستقبلية من الفترة ١١/ تموز/٢٠٢٢ الى ٣٠/ايلول/٢٠٢٢ من اجل تلخيص إحصاءات حالات الإصابة بفايروس التهاب الكبد الفايروسي.تتضمن دراستنا 238حالة من سجلات مستشفى حماية الطفل التعليمي.
النتائج:لوحظت معظم الحالات في الفئة العمرية من 6إلى 10 سنوات .(p = 0 كان التوزيع بين الجنسين متساويا تقريبا ، حيث بلغ الذكور 50.8٪ والإناث 49.2٪. تضمنت الملامح السريرية اليرقان 96.2٪، تضخم الكبد 45.4٪، انتفاخ البطن 15.6٪، تضخم الطحال 7٪، والنزيف 5.9٪). أظهرت نتائج الموجات فوق الصوتية تضخم الكبد بنسبة 45.4٪، وجدار المرارة الوذمي السميك 31.2٪، وتضخم الطحال 14.9٪، والاستسقاء 4.2٪). كشف التحليل الكيميائي الحيوي عن متوسط قيم (l / U 786.8 SGPT و (l / U 647.6 SGOT و 10.34 TSB مجم / ديسيلتر) و 3.9 Alb جم / ديسيلتر) و 14.9 PT ثانية) و 36.45 PTT ثانية) و .(INR 1.15 كانت الحالات الشديدة 8 في العدد ، مع الفشل الكبدي الحاد 4 وفيات) و 6 مع اعتلال الدماغ الكبدي 5 وفيات) ، ومعدل وفيات 2.1٪ كانت نسبة الذكور إلى الإناث 4: 1..
الاستنتاجات:تؤكد نتائج هذا البحث على الحاجة الى اجراء مناقشات حول تطبيق اللقاح للوقاية من الإصابة بفايروس التهاب الكبد الوبائي أ ومكافحته في العراق حيث نلاحظ أن الإصابات مرتفعة والمخاطر مستمرة.
مفتاح الكلمات:التهاب الكبد الفايروسي أ ، لقاح التهاب الكبد الفايروسي أ،عتلال الدماغ الكبدي، فشل الكبد الحاد، مستشفى حماية الطفل التعليمي.