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Evaluation of liver function tests in Hepatitis A,B and C in children in Ramadi city

Ghaith M. Ahmad*, Noor Naji Al-Hayani, Ammar M. Abdulla

Biology Department, College of Medicine, University of Anbar, Anbar,Iraq;

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ABSTRACT

Hepatitis A (HAV), B (HBV), C (HCV), D (HDV), and E (HEV) are the leading causes of worldwide liver disease. Acute viral hepatitis (AVH) is a significant public health concern, especially in children from developing countries with inadequate sanitation and water. Chronic HBV infection causes a large number of liver disease fatalities globally. Pediatric HCV and HDV prevalence statistics are scarce.

In this study, we conducted a retrospective analysis of 127 children from the AL-Anbar government to assess the prevalence of different types of viral hepatitis. Blood samples were collected from children aged 6 months to 15 years, and comprehensive diagnostic tests were performed, including biochemical analysis and rapid tests for IgM and IgG detection. ELISA was used to provide accurate and reliable results for diagnosis.The study revealed a high prevalence of hepatitis A, B, and C among the enrolled children, with hepatitis A being the most common. Abdominal pain, jaundice, and fever were the predominant symptoms observed. Notably, 50% of children with HBV infection also tested positive for HDV-Ag. However, no cases of HEV infection were detected. Comparative analysis of liver function markers showed significantly higher levels of AST-GOT, ALT-GPT, GGT, ALP, total bilirubin, and direct bilirubin in HCV patients compared to those with HAV and HBV infections.

It is crucial to prevent viral hepatitis in children. This can be achieved through vaccinations and proper sanitation practices, which can help lessen the impact on public health. Detecting and managing the disease early can also help minimize complications and improve the overall outcome.

Introduction

Globally, viral hepatitis infections are a significant cause of liver illness. Hepatitis A, B, C, D (or delta), and E are the five known main hepatitis viruses. Other viruses, such as CMV and Epstein-Barr virus, can also cause hepatitis as a systemic infection. [1].

HAV and HEV are viruses that specifically infect the liver and are transmitted through contaminated feces. Children in underdeveloped areas with poor sanitation and hygiene standards are vulnerable to acute viral hepatitis [2]. WHO estimates that 20 million cases of HEV and 1.4 million cases of HAV are recorded globally each year.

The annual death toll from acute HAV and HEV infections is about 100,000 and 60,000, respectively. Hepatitis B virus (HBV) infection is a prominent global cause of acute and chronic liver disease with high rates of morbidity and death [3].

In 2019, WHO estimated 296 million people had chronic HBV infection, with 1.5 million new infections annually and 887,000 deaths. The risk of chronic infection depends on the age at exposure, with a 90% risk in infancy and <10% in adolescents and adults [4]. HCV infection is often underestimated in children and adolescents. Transmission modes, clearance rates, fibrosis progression, and treatment options differ from those in adults [5]. Moreover, few reports on the prevalence of HDV infection in the pediatric population reported. In this study, 127 children were enrolled, they were diagnosed with different types of viral hepatitis.

*Corresponding author at : Biology Department, College of Science, University of Anbar
ORCID:https://0000:Tel:+96407806439163
Email: med.noor.naji@uoanbar.edu.iq

Materials and Methods

In our study, we conducted a retrospective analysis of 127 children living in the AL-Anbar government to assess the prevalence of hepatitis. The study included children aged 6 months to 15 years from Ramadi and other cities. Blood samples were collected from all 127 children using a gel tube, with 3 ml of blood collected for biochemical and rapid tests (IgM and IgG detection). To ensure accurate results, ELISA analysis was performed on the collected blood samples.

This comprehensive approach to blood collection aimed to provide reliable and precise results for a better diagnosis and treatment of the children involved.

The data analysis was conducted using SPSS 25. Mean and standard deviation were used to represent quantitative data, whilst frequencies and percentages were used to represent qualitative data. To compare groups, paired t-tests were utilized, with a P-value less than 0.05 indicating statistical significance and 0.01 indicating high significance. [6]. The Ethical approval committee (EAC) of the Ministry of higher education and scientific research - University of Anbar / Iraq accepted the study.

Serological tests:

1. Detection Hepatitis A Virus Immunoglobulin M Rapid Test.

Hepatitis A Virus IgM Rapid Test was used CTK BIOTECH (USA) A lateral flow immunoassay for the qualitative detection of IgM anti-hepatitis A virus (HAV) antibodies in human serum, plasma, or whole blood. Anti-HAV IgM detection in serum, plasma, or whole blood. It can be completed in 15 minutes by persons with minimum training and without the use of laboratory equipment.**2. Detection Hepatitis B Virus Markers by Rapid Test Panel.**

Hepatitis B Virus by Rapid Test Panel HIGHTOP 5-in-1 (USA), one step test for the qualitative detection of Hepatitis B virus in human.

3. Detection of Hepatitis C Antibody Plus by Rapid Test.

Hepatitis C Antibody was used by the OnSite CTK (USA), HCV Ab Plus Rapid Test principle is a double antigen lateral flow chromatographic immunoassay.

4. Detection of Hepatitis E Immunoglobulin M by Rapid Test.

OnSite CTK (USA) utilized a lateral flow chromatographic immunoassay for qualitative detection of anti-hepatitis E virus (HEV) IgM in human serum. It is intended for use by professionals as a screening test and offers preliminary test results to help in the diagnosis of HE Vinfection.

Results.

The age range of studied children was one month to 15 years with a mean of 6.89 ± 4.10 years. The highest proportion of children were found in the age group of 5 – 9 years, 48 children (37.8%) (Figure 1).

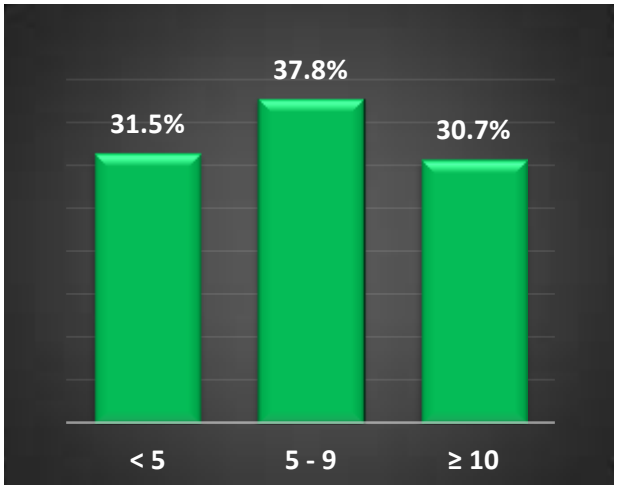

Figure 1: Distribution of the studied children according to age

Regarding gender, there were 76 males (59.8%) versus 51 females (40.2%) with a ratio of 1.49:1. More than half of study children 69 (54.3%) live in rural areas while the remaining 58 (45.7%) live in urban areas (Table 1).

Table 1: Distribution of the study group according to baseline characteristics

Sociodemographic Characteristics	No. (n= 127)	Percentage (%)
Gender		
Male	76	59.8
Female	51	40.2
Residency		
Urban	**58**	**45.7**
Rural	**69**	**54.3**

A retrospective analysis was conducted on 127 children, revealing that abdominal pain was the most common symptom in 54.3% of patients, followed by jaundice in 51.2% and fever in 47.2%. Other symptoms included loss of appetite, nausea and vomiting, fatigue, pale or clay-colored stool, and dark urine (Figure 2).

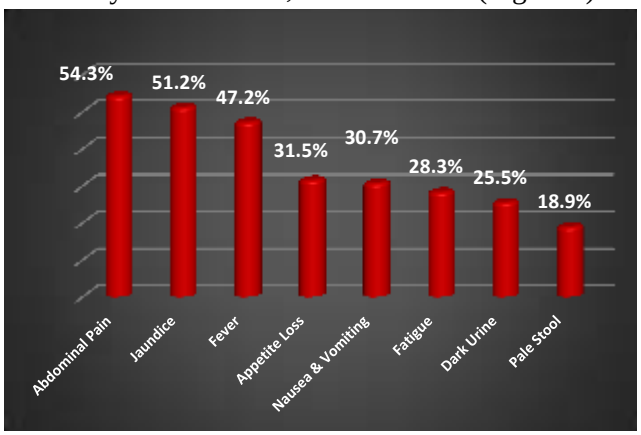

Figure 2: Distribution of the studied children according to clinical presentation

Prevalence of hepatitis virus infection

The hepatitis A virus was detected in 50 (39.4 percent) of 127 youngsters (HAV). Hepatitis B virus (HBV) and hepatitis C virus (HCV) were found in 42 (33.1%) and 35 (27.5%) youngsters, respectively. HDV-Ag was present in fifty percent of individuals with HBV. In addition, no HEV was found among the youngsters tested (Figure 3).

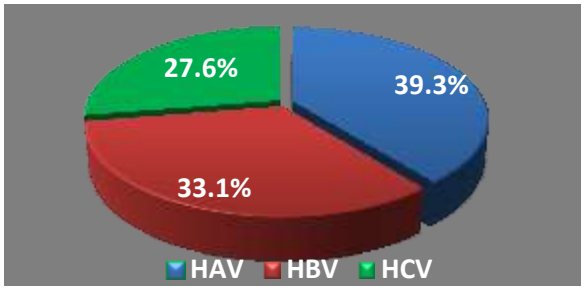

Figure 3: Prevalence of viral hepatitis A, B, and C among the studied children

This study found a statistically significant association between HAV and children age. The proportion of HAV was significantly higher in children aged between 5 – 9 years (50%, P= 0.004). Gender and residency of children were not significantly associated (P ≥ 0.05) with HAV infections (Table 2).

Table 2: Distribution of the study group according to sociodemographic characteristics and HAV

Sociodemographic Characteristics	HAV		P-Value*
	Positive n= 50	Negative n= 77	
Age (Years)			
< 5	19 (47.5)	21 (52.5)	0.004
5 - 9	24 (50.0)	24 (50.0)	
≥ 10	7 (17.9)	32 (82.1)	
Gender			
Male	20 (39.2)	31 (60.8)	0.977
Female	30 (39.5)	46 (60.5)	
Residency			
Urban	24 (41.4)	34 (58.6)	0.671
Rural	**26 (37.7)**	**43 (62.3)**	

* Significant difference between percentages using Pearson Chi-square test at 0.05 level.

It was clear that the prevalence of HBV was significantly higher among children aged ≥ 10 years (51.3%, P= 0.013) and children who live in rural areas (42%, P= 0.019), while the proportion of HBV infection was not significantly different (P ≥ 0.05) according to children gender (Table 3).

Table 3: Distribution of the study group according to sociodemographic characteristics and HBV

Sociodemographic Characteristics	HBV		P-Value*
	Positive n= 42	Negative n= 85	
Age (Years)			
< 5	11 (27.5)	29 (72.5)	0.013
5 - 9	11 (22.9)	37 (77.1)	
≥ 10	20 (51.3)	19 (48.7)	
Gender			
Male	28 (36.8)	48 (63.2)	0.270
Female	14 (27.5)	37 (72.5)	
Residency			
Urban	13 (22.4)	45 (77.6)	0.019
Rural	**29 (42.0)**	**40 (58.0)**	

HCV infections were not significantly associated associated (P ≥ 0.05) with age, gender, and residency of the studied children (Table 4).

Table 4: Distribution of the study group according to sociodemographic characteristics and HCV

Sociodemographic Characteristics	HCV		P-Value*
	Positive n= 35	Negative n= 92	
Age (Years)			
< 5	10 (25.0)	30 (75.0)	0.845

5 - 9	13 (27.1)	35 (72.9)	
≥ 10	12 (30.8)	27 (69.2)	
Gender			
Male	18 (23.7)	58 (76.3)	0.233
Female	17 (33.3)	34 (66.7)	
Residency			
Urban	20 (34.5)	38 (65.5)	0.109
Rural	**15 (21.7)**	**54 (78.3)**	

Comparison of Biochemical parameters (Liver function tests).

The study compared biochemical parameters among different types of viral hepatitis. The mean levels of various parameters differed significantly depending on the type of viral hepatitis. Post hoc multiple comparisons were conducted using one-way ANOVA to confirm the differences in mean levels between HAV, HBV, and HCV. In HCV patients, the mean levels of AST-GOT, ALT-GPT, GGT, ALP, total bilirubin, and direct bilirubin were significantly higher compared to HAV and HBV patients ($P < 0.05$). HAV patients had significantly higher mean levels of AST-GOT, ALT-GPT, ALP, total bilirubin, direct bilirubin, and indirect bilirubin, but a lower mean level of GGT compared to HBV patients. There was no significant difference ($P \geq 0.05$) in the mean level of indirect bilirubin between HAV and HCV (Table 5).

Table 5: Comparison in mean levels of biochemical parameters between the three types of viral

Biochemical Parameters	Hepatitis Virus			P - Value*
	HAV Mean ± SD	HBV Mean ± SD	HCV Mean ± SD	
AST-GOT (U/L)	738.8 ± 347.1	506.3 ± 350.5	1718.6 ± 642.3	0.001
ALT-GPT (U/L)	621.2 ± 278.8	466.9 ± 301.6	1409.9 ± 550.4	0.001
ALP (U/L)	1404.1 ± 762.1	1085 ± 636.9	2463.6 ± 783.4	0.001
GGT (U/L)	90.48 ± 35.03	118.4 ± 55.15	179.8 ± 73.91	0.001
Total Bilirubin (mg/dl)	12.18 ± 3.88	6.24 ± 5.32	17.55 ± 4.11	0.001
Direct Bilirubin (mg/dl)	8.91 ± 2.88	5.09 ± 3.42	14.91 ± 4.12	0.001
Indirect bilirubin (mg/dl)	3.19 ± 1.90	1.13 ± 1.02	2.62 ± 1.04	0.001

Discussion

The participants in the study ranged from one month to 15 years old, with a mean age of 6.89 ± 4.10 years. The 5-9 years age group was the largest, accounting for 37.8% of the sample. Males were more prevalent, comprising 59.8% of the participants, resulting in a male-to-female ratio of 1.49:1. Compared to a previous study, this study had a younger mean age and a higher proportion of males. Additionally, 41.9% of the children in this study belonged to the upper social class [7]. The Barro et al study enrolled 2015 children aged, in which the mean and SD of age was 58 ± 48.82 months, ranged between two weeks and 186 months). There was a slight male predominance, as 1026 (50.9%) male children and 989 (49.1%) female: sex ratio 1.03 [8]. Furthermore, a close result observed in Darwish et al study, in which results showed that males formed the majority of the cases (54.6%) while the female percentage was wa45.4%, with male to female ratio of 1.20. Moreover, for age distribution, those below 15 year of age were the main affected group with more than three quarters of total cases [9].

Abdominal pain, jaundice, and fever were common symptoms in the study, with other reported symptoms including loss of appetite, nausea and vomiting, fatigue, pale or clay colored stool, and dark urine. In comparison to another study, fever, loss of appetite, fatigue, abdominal pains, joint pain, jaundice, dark urine, and itchy skin were reported in enrolled children [10]. On the other hand, Rasheed et al study reported that the common complaints were fever and appetite loss (71% for both), vomiting in 57%, abdominal pain in 45.5%, yellowish discoloration of eyes in 67% and nausea in 44% of patients enrolled [11].

The observed difference may be due to sample size, genetics, maternal infection, or higher rates of viral infections in males. This suggests that behavioral or occupational exposures may contribute to infection and severity, especially for viruses like Epstein Barr, HBV, and HCV, which affect males more significantly than females [12].

a. prevalence of hepatitis virus infection

Among the 127 children included in this study, 39.4% were diagnosed with Hepatitis A virus (HAV), while Hepatitis B virus (HBV) and Hepatitis C virus (HCV) were detected in 33.1% and 27.6% of the children, respectively. Half of the HBV-positive cases

were also positive for HDV-Ag. Notably, no cases of Hepatitis E virus (HEV) were found among the children studied. In contrast to our findings, AA Darwish et al. conducted a study involving 9352 patients with viral hepatitis and reported different results. They found that Hepatitis A virus infection constituted the majority (61.7%) of hepatitis virus infections, followed by Hepatitis B (25.2%), Hepatitis C (11.7%), and Hepatitis E (1.2%) [9]. Different results were published in Özgenç et al study, in which 170 children were enrolled, they observed that overall Hepatitis-D virus infection rate was 1,76% (3/170); two patients with eAg-negative hepatitis B and one patient in the immunoactive phase [13]. In Ezeilo et al.'s study, the infection rate of Hepatitis B virus (HBV) among the participants was reported as 11.5% [10], which aligns with the findings of a recent meta-analysis conducted by Musa et al., which indicated an overall prevalence of 11.5% in children infected with viral hepatitis [14]. Another study by Solimann et al. in 2015 examined 10,044 children aged 1-14 years to estimate the prevalence of Hepatitis C virus (HCV). The results demonstrated a prevalence of 0.4% for HCV. HCV antibody seroprevalence was 0.7% among male children, with viremia observed in 0.2% of cases. Among female children, HCV antibody seroprevalence was 0.2%, with viremia detected in 0.1% of cases [15]. In Das et al study, different results reported, as found that HAV was present in 73.2% and HEV was present in 10.7% of cases enrolled [16].

The observed differences can be attributed to variations in methodological approaches, study population characteristics, and patient-specific factors, such as age at the time of diagnosis (whether mature or premature), presence or absence of maternal disease transmission, vaccination status, blood transfusions, hemodialysis, and household contacts of HBV carriers.

Viral hepatitis infection in children and adolescents is not well understood. Hospital-based cohorts show up to 20% prevalence of HCV infection in adolescents and children treated for various conditions[17]. Compared to adults, testing, treatment, and prevention strategies among children and adolescents have received less attention, in part because until 2017 none of the direct-acting antiviral treatment regimens had been approved for use in those younger than 18 years and there were significant gaps in the evidence to inform pediatric management practices and policies[18].

The study found that children aged 5-9 years had a higher proportion of HAV infections. Gender and residency were not significantly associated with HAV infections. Another study found that urban residents were less likely to be seropositive for HAV and males were more likely to be seropositive, with seroprevalence increasing with age [19]. Kareem et al. found a 38.3% seroprevalence of HAV. Age was the only significant factor associated with higher HAV prevalence ($P < 0.001$), while variables such as gender, education, income, and water source did not show significant differences ($P > 0.05$) [20]. Michaelis et al. discovered that 13 percent of Germans aged 3 to 17 had an overall seroprevalence for anti-HAV antibodies that was weighted. Seroprevalence did not substantially differ by gender ($P>0.05$), but was strongly linked with advancing age (P0.05) [21], this was in consistent with Gözü Pirinççioğlu et al study, as found that HAV sero-positivity increases as age increase, and such difference was statistically significant ($p<0.001$) [22]. Age has been associated with internal problems and poor socio-economic status, leading to a higher prevalence of HAV infection. However, as access to safe drinking water and socio-economic conditions improved over time, HAV seroprevalence decreased, resulting in greater protection against HAV infection for susceptible individuals [19]. A number of globe countries with high socioeconomic standards are becoming more susceptible to HAV infections as a result of declining endemicity and the concurrent decline in naturally acquired immunity throughout infancy, this common infection due to that HAV is mostly food borne illness and can be spread through contaminated water and unwashed food it is the easiest virus to transmit among age school children [23].

Protection efforts to manage the illness include enhancing socioeconomic status, boosting educational attainment, distributing safe drinking water, enhancing infrastructure and sewage disposal, and educating the people about the need of cleanliness and immunization[22].

In addition, HBV prevalence was substantially higher among children under 10 years old ($P= 0.013$)

and rural children (P= 0.019), but not gender (P 0.05). Age raised HBsAg and HBc Ab prevalence in study conducted by Zhu et al. For HBc Ab (P=0.042) but not HBsAg (P=0.801), age groups differed [24]. In contrary, 198 children were enrolled in Olasinde et al study, in which no significant relationship between Hepatitis-B status of the enrolled children and their age (P= 0.79), gender (P=1.0), and social status (P=0.49) [7], which was in agreement to that conducted by Ezeilo and other co-authors, in which prevalence of HBV infection was similar in all the age group of the enrolled children and HBV infection was not associated with age group (P= 0.9) (10). In contrast, Ikobah et al. studied 749 children aged 11-19. With a ratio of 1.7:1, 477 (63.7%) were female and 272 (36.3%) were male. With 384, the 14-16 age group had the biggest share (51.8 percent). 14.8 ± 2.0 years was the mean and SD [25].

Different screening methods used for laboratory analysis, all these factors, in addition to their socio-economic and general healthy maternal neonatal condition, could have accounted for the differences in the results of the studies mentioned above.

Since viral clearance depends mostly on exposure age, the incidence and prevalence rates of HBV infection in children are mostly determined by this age. While 95% of infections acquired by adults spontaneously clear, more than 90% of exposed neonates and over 30% of children under the age of 5 fail to eliminate HBV from the body, leading to persistent infection [26]. Therefore, early seeking of medical aid, health education on preventative behaviors, and efficient use of these medical resources may have contributed to this trend. Thoughts should be given to continuing and stepping up vaccination programs for these kids [27].

According to the findings of the present investigation, HCV infections are not substantially linked to hepatitis C virus (HCV) infections. There was no association between HCV infections and the children's age, gender, or place of residence, according to the current study. In a comprehensive update on HCV infection gender inequalities in Egypt, Abdel-Gawad and colleagues discovered that HCV in children demonstrated no significant differences between men and females in HCV antibody seroprevalence or PCR positivity in relation to age, gender, and residence (P 0.05). Similarly, in a study that presents a comprehensive update on HCV infection gender differences in Egypt, conducted by Abdel-Gawad and other co-authors, the results indicated that neither the seroprevalence of HCV antibodies nor the prevalence of PCR positivity differed significantly between males and females among children with HCV [28].

In the same vein, the results of a study by Tarky et al. found that the prevalence of anti-HCV IgG antibodies was lowest (0.3% in the first decade of life) and marginally, but not substantially, increased with age. Also, males were 75% more likely than females to have positive anti-HCV antibodies, but this connection was not statistically significant (P>0.05) [29].

Contrarily, it has been estimated that the worldwide prevalence of viremia in the pediatric demographic, specifically those aged between 0 and 18 years, stands at approximately 0.13%, with a 95% uncertainty interval ranging from 0.08% to 0.16%. Furthermore, a significant age-related increase in HCV prevalence has been noted (p<0.001) (30). Moreover, in Soliman et al study, there were 14.5% of patients were positive for anti-HCV. Prevalence of anti-HCV was significantly higher in males than females (p<0.0001). While the age of the participants was not significantly related to the prevalence of HCV among the participated children (P>0.05) [15].The worldwide estimate for viremic prevalence in children aged 0–18 was 0·13 percent (95 percent uncertainty interval 0·08–0·16). HCV prevalence rose with age (p<0.001) [30].14.5 percent of Soliman et al. patients had anti-HCV antibodies. Males have more anti-HCV than females (p<0.0001). HCV prevalence in children did not vary with age (P>0.05).

This difference may be due to the different sample sizes and the fact that men are more likely to get parenteral virus transmissions, such as HCV, from injecting drugs. Also, the way men live puts them at a higher risk for things like unprotected sex and having more than one partner. In this study, people with HBV were much more likely to have fever and loss of appetite (P= 0.001 and P= 0.034, respectively), while people with HCV were much more likely to have dark urine (P= 0.004). Differently, results published in Wilkins et

al. study researchers reported that dark urine and jaundice to be associated significantly with HBV infection. Suggestion that similar clinical symptoms are often encountered in patients with HBV-related chronic liver disease [31]. In contrast, analyzing the clinical manifestations of pediatric patients involved in the Ezeilo et al trial revealed that jaundice, dark urine, fever, joint pain, itchy skin, lack of appetite, weariness, and stomach discomfort were not related with HBV infection. ($P > 0.05$) elevation in liver enzyme in our result in individual with hepatitis C due to the damaged in parenchymal liver cells and leaking of these liver enzymes into the blood [10].

The dark color of the urine was the sole symptom observed to be substantially more prevalent in HAV-positive individuals than in HEV-positive patients ($P=0.001$) [11]. Even though it is rare, children and teens have been found to have clinically obvious acute viral hepatitis infection in both isolated cases and large outbreaks. Few studies have looked at the symptoms of acute viral hepatitis infection (especially HCV infection) in children. However, fatigue, jaundice, dyspepsia, and abdominal pain are common in adults with acute viral hepatitis infection. If a child at risk has these signs, testing should be thought about [32].

b. comparison of biochemical parameters

HCV patients had greater mean AST-GOT, ALT-GPT, GGT, ALP, total, and direct bilirubin than HAV and HBV patients ($P < 0.05$). HAV patients had significantly higher mean levels of AST-GOT, ALT-GPT, ALP, total, direct, and indirect bilirubin and lower mean GGT than HBV patients. HAV and HCV had similar indirect bilirubin levels ($P > 0.05$). Desikan and colleagues found that HBV/HCV co-infected individuals had higher ALT, AST, ALP, and bilirubin levels than HBsAg mono-infected patients ($p < 0.001$) [33]. Rasheed et al. found various results. INR averaged 1.9±0.6. Only HEV patients had higher ALT levels than HAV patients ($P=0.04$). The remaining biochemical markers did not differ between HAV and HEV patients ($P>0.05$) [11]. The discrepancy may be due to the disease's virulence, length, child's general health, biochemical parameters, accuracy of investigation, operator expertise, and different testing methods.

Acute hepatitis in youngsters is a worrying old disease. Many pediatric viruses are hepatotropic and can cause severe disease in a minority of patients [34].

Liver injury causes serum levels of liver enzymes like ALT and AST to rise rapidly to more than 100 times the usual range. In severe situations, patients might rapidly worsen, causing coagulopathy, jaundice, and encephalopathy that may progress to liver failure. Some patients have functional deficits and low aminotransferase levels. However, liver regeneration has limits, thus in progressing cases, children are directed to liver transplantation institutions. Global hepatitis A and B immunization initiatives have improved public health and well-being during the past few decades [34].

Conclusion:

This study highlights the high incidence of Hepatitis A, B, and C in children in the AL-Anbar province, Iraq, with elevated liver enzyme levels observed in Hepatitis C patients. These findings necessitate immediate public health interventions, including screenings, vaccinations, and enhanced hygiene education.

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تقييم اختبارات وظائف الكبد في حالات التهاب الكبد الوبائي A وB وC لدى الأطفال في مدينة الرمادي

غيث محمد احمد ، نور ناجي الحياني* ، عمار محمد عبدالله
قسم الاحياء المجهرية،كلية الطب، جامعة الانبار،الانبار،العراق

الخلاصة:
يعتبر التهاب الكبد الفايروسي نوع HAV)، HBV)، HCV)، وHDV)، HEV)هو من الأسباب الرئيسية لأمراض الكبد في جميع أنحاء العالم. يعد التهاب الكبد الفيروسي الحاد (HAV) مصدر قلق كبير على الصحة العامة، وخاصة عند الأطفال من البلدان النامية التي تعاني من عدم كفاية الصرف الصحي والمياه. تسبب العدوى المزمنة بفيروس التهاب الكبد B عددًا كبيرًا من الوفيات الناجمة عن أمراض الكبد على مستوى العالم. إحصائيات انتشار فيروس التهاب الكبد الوبائي (سي) وفيروس التهاب الكبد (د) لدى الأطفال نادرة.
المواد وطرق العمل: في هذه الدراسة، أجرينا تحليلاً استرجاعياً لـ 127 طفلاً من محافظة الأنبار لتقييم مدى انتشار أنواع مختلفة من التهاب الكبد الفيروسي. تم جمع عينات الدم من الأطفال الذين تتراوح أعمارهم بين 6 أشهر إلى 15 سنة، وتم إجراء اختبارات تشخيصية شاملة، بما في ذلك التحليل الكيميائي الحيوي والاختبارات السريعة للكشف عن IgM وIgG. تم استخدام ELISA لتقديم نتائج دقيقة وموثوقة للتشخيص. النتائج: كشفت الدراسة عن ارتفاع معدل انتشار التهاب الكبد A وB وC بين الأطفال المسجلين، وكان التهاب الكبد A هو الأكثر شيوعاً. وكانت آلام البطن واليرقان والحمى هي الأعراض السائدة التي لوحظت. ومن الجدير بالذكر أن 50٪ من الأطفال المصابين بعدوى فيروس التهاب الكبد B كانت نتائجهم إيجابية أيضًا لـ HDV-Ag.
أظهر التحليل المقارن لعلامات وظائف الكبد مستويات أعلى بكثير من AST-GOT، وALT-GPT، وGGT، وALP، والبيليروبين الكلي، والبيليروبين المباشر في مرضى التهاب الكبد الوبائي (HCV) مقارنةً بأولئك المصابين بعدوى HAV وHBV.
من الضروري الوقاية من التهاب الكبد الفيروسي عند الأطفال. ويمكن تحقيق ذلك من خلال التطعيمات وممارسات الصرف الصحي المناسبة، والتي يمكن أن تساعد في تقليل التأثير على الصحة العامة. يمكن أن يساعد اكتشاف المرض وإدارته مبكرًا في تقليل المضاعفات وتحسين النتيجة الإجمالية.
الكلمات المفتاحية: *التهاب الكبد الفيروسي الحاد، التهاب الكبد عند الأطفال، أمراض الكبد*