

Pattern of Liver Diseases in Sudanese Children

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Abstract

We aimed at determining the pattern and the incidence of liver disease in the Sudanese children referred to the Gastroenterology unit as Gaafar Ibn Oaf Specialized Children Hospital, which has not been studied before.

Materials and Methods: In a cross-sectional study conducted over 5 years, 450 liver needle biopsies were sent to the pathology laboratory of our center. Slides were prepared from paraffin-embedded blocks, stained by routine H & E and special stains and were then reviewed. The frequency of each disorder, separately and in combination with the age group or gender of the patient were compared with other similar studies.

Results: The male to female ratio was 1.5:1. The age range between 1 month and 15 years old and 42% were less than 1 year old. The most common histological diagnosis was liver cirrhosis where no specific cause could be found (26%) followed by neonatal hepatitis (20%), fatty liver (12%), Biliary Atresia (10%), chronic hepatitis (8%), metabolic liver disease (6%), Progressive Intrahepatic Cholestasis (5.5%), non specific pathological changes (4.4%) and Hepato Cellular Carcinoma in (4%).

Conclusion: A liver biopsy is a useful and practical tool for the appropriate diagnosis of pediatric liver diseases. We found that Idiopathic Liver Cirrhosis, Neonatal Hepatitis, Fatty Liver, Biliary Atresia and Chronic Hepatitis in the stated order are the most prevalent histological diagnosis in Sudanese children. Hepatocellular Carcinoma is significantly high in our pediatrics population.

Keywords: Children, histopathology, liver diseases significance and pattern of liver diseases.

Liver disease in pediatrics is one of the most significant causes of morbidity and mortality in this age group and includes a broad spectrum of disorders such as infections, developmental abnormalities, metabolic and neoplastic disorders that finally result in hepatic dysfunction and cirrhosis. The pattern and incidence of different disorders have not been studied before in Sudan.

Biliary atresia and neonatal hepatitis are the two most common causes of cholestasis in the neonatal period^{1, 2}. Treatment modalities differ among each condition; therefore, an early and correct diagnosis has a crucial role in the proper management of these children.

Various diagnostic tools including liver function tests, enzyme assays, or imaging techniques are available for the evaluation of liver disorders, but although liver biopsy is an invasive method, it is the corner stone for a precise diagnosis and differentiates between the foregoing conditions¹.

In our study, we aimed at determining the frequency of different patterns of liver needle biopsies performed in Sudanese children and compared them with other studies.

Material and Method

In a cross-sectional study conducted over five years (January 2005 to January 2010), 450 liver biopsies were sent to the pathology laboratory of Gafaar Ibn Oaf (GIO) Specialized Children Hospital, Khartoum-Sudan. Indications for liver needle biopsies included abnormal liver function tests, prolonged jaundice, and unexplained hepatomegaly. The biopsies were taken by

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the use of Menghini needles and were immediately fixed in 10% formalin solution. Alcohol was used as another fixative solution. After processing in an automated tissue processor, paraffin-embedded blocks were serially sectioned and were then stained by H & E, trichrome and PAS with and without diastase methods. Other special stains such as perls stain, rhodanin stain and reticulin stain were used when required. Slides showed less than three portal spaces considered as inadequate specimens. The frequency of each disorder, separately and in combination with the age group or gender of the patients was

calculated and compared with other similar studies.

Results

A total of 450 liver biopsies were studied with a male to female ratio of 1.42:1. The age range was from one month to 15 years old. Patients from one month to one year old composed the most frequent (42%) age group. A total of 144 (32%) patients were between one and five years and the rest were above five years of age.

The most common histological diagnosis was liver cirrhosis (26%) followed by neonatal hepatitis (20%) (Table1).

Table1: Frequency of histological liver diseases, separately and in combination with age

Liver Disorder	Age			Total no (%)
	1m-1year	1-5year	5-15year	
Liver Cirrhosis	0	53	64	117(26%)
Neonatal Hepatitis	84	6	0	90(20%)
Fatty Liver	15	39	0	54(12%)
Biliary Atresia	42	3	0	45(10%)
Chronic Hepatitis	0	14	22	36(8%)
Metabolic	15	5	7	27(6%)
Progressive FamilialIntrahepatic Cholestasis	25	0	0	25(5%)
No Significant Change	0	20	0	20(4.4%)
Hepatocellular Carcinoma	0	0	18	18(4%)
Bile Duct Paucity	8	1		9(2%)
VenoOcclusive	0	0	6	6(1.3%)
Hebatoblastoma,Neuroblastoma,Histocytosis	4	2	0	6(1.3%)

We found that neonatal hepatitis and biliary atresia in order are the two most common diagnoses from one month to one year old. As age increased, liver cirrhosis, fatty liver and chronic hepatitis became the dominant diagnoses. A total of 18 children were diagnosed with HCC, 10 of which were Hepatitis B related.

Discussion

For patients who suffer from hepatomegaly and present with an abnormal liver function tests or unexplained jaundice, a liver biopsy may be the best and the only way to attain the correct diagnosis³. In this regard, information on the patient's medical history, physical examinations, biochemical tests and viral and autoimmune markers may be helpful and

valuable. In addition, epidemiologic and national criteria can play an important role in the primary evaluation of these patients. In our study, cirrhosis of unknown etiology was the most prevalent (26%) histological diagnosis.

The next common group of disorders in our study was neonatal hepatitis (20%). All children in this group were under one year of age with male predominance (M: F ratio was 4/1). Higher incidences of neonatal hepatitis, - as the most common diagnosis before the age of two years- were reported elsewhere^{4, 5} Ahmad, et al. found this disorder in 10% of their patients with male dominance¹.

The next common group of disorder in our study is fatty liver which was mainly in the age group 1-5 years, which express the high

incidence of macro and micro nutrient deficiency in our country.

Chronic hepatitis was noted in 10% of children referred to GIO within these five years. All of them were more than one year old. Our result was close to Ahmad, et al⁶. but in contrast to others¹. We detected a higher incidence of HBV related chronic hepatitis. This is similar to the findings in China and Karachi^{7,8}.

Other rare diagnoses such as metabolic disease, glycogen, or lipid storage disease, etc. should be kept in mind during the investigation of a liver disorder, because with proper management, we can prevent the progression to cirrhosis. The predominance of biliary atresia in Sudanese pediatrics may be because our hospital is a referral center. The high percentage of liver cirrhosis without a specific cause makes one wonder about the possibility of the presence of a specific type of cirrhosis in Sudanese children, undiagnosed metabolic diseases or a sinister course of the fatty liver in the younger age group we thought previously it runs a benign one !!. Further studies are needed to investigate the cirrhosis in relation to the genetics and diet; also a close follow up is needed for children with fatty liver in our population to solve this dilemma.

There is relatively high rate of HCC in our children. Proportionally, the high incidence of chronic hepatitis may indicate that the infants had acquired viral hepatitis in their prenatal period. As Hepatitis B vaccinations have been just started two years back, we are still going to see a lot of children who are affected with the high risk of HCC for probably the next 15 years or so.

Conclusion

Liver biopsies are useful and practical tool for the appropriate diagnosis of pediatric liver disease. The study has provided some background information on the occurrence of specific histologically diagnosed liver diseases in Sudanese children. We found, liver cirrhosis, chronic hepatitis and neonatal hepatitis are the most prevalent histological diagnoses in Sudanese pediatrics, and HCC is relatively high in our children.

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