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Chronic Liver Disease in Infancy and Preschool Children

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ABSTRACT

Background: Chronic liver disease is an uncommon problem in infancy and early childhood and often presents a diagnostic difficulty due to atypical presentation and lack of experience.

Objective: To highlight the causes and prevalence of these disorders in early childhood.

Setting: A prospective descriptive case series study carried out during the period from August 1999 to July 2001 in the Iraqi Gastroenterology Center in Baghdad.

Patients and Methods:

Thirty consecutive children below 6 years of age (8 infants and 22 preschool children) who fulfilled the criteria of chronic hepatobiliary disease were included.

Results and Conclusion: The commonest causes of chronic liver disease in infancy were extrahepatic bile duct disease (50%) and metabolic liver disease (37.5%). The most common causes in preschool children were chronic virus B hepatitis and metabolic cong. Liver disease (18.2%) for each, most of the cases presented in late stage of the disease which necessitate more awareness and early diagnosis. About ¼ th. of the cases had cryptogenic causes.

Key word: chronic liver disease, children

INTRODUCTION

Liver disease in childhood often present significant diagnostic difficulties. These disorders may present in similar fashion due to the liver's limited response to injury. Additionally, since many of the individual conditions affecting the liver are relatively rare, the non specialists often feels inexperienced in generating and evaluating a differential diagnosis[1]. Although some of the signs and symptoms of liver disease in children resemble those of adults, some unique variations exist, some of these variations were due to diagnoses more typically seen in infants and children, such as metabolic diseases, and others are due to the propensity of young infants to develop cholestasis in response to numerous different processes[2].

The pediatric chronic liver disease is categorized as follows[3]:

1. Anatomic abnormalities which are subdivided into intrahepatic bile duct disease (including: congenital hepatic fibrosis, intrahepatic paucity of bile ducts and Caroli's disease) and extrahepatic bile duct disease (extrahepatic biliary atresia. choledochal cyst... etc).
2. Infectious causes (HBV, HCV, HDV and HGV ...etc).
3. Inherited metabolic liver diseases (cystic fibrosis, ✔1- antitrypsin deficiency, galactosemia, glycogen storage disease, hemochromatosis, Wilson's disease) & others.
4. Autoimmune hepatitis.
5. Vascular disease of the liver (Budd-chiari syndrome and venoocclusive disease).

The aim of this study is to highlight the causes, clinical features. The frequency of chronic liver disease in infancy and early childhood.

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Patients And Methods

This prospective study was carried out in the specialized center for gastroenterology and hepatology during the period from August 1999-July 2001. Thirty patients below 6 years of age who were admitted to the center fulfilling the criteria of chronic liver disease[4] were included in this study. Those patients were subdivided into 2 groups[5]:

1.Eight Infants below one year of age.
2. Twenty two Preschool children between 1-6 years.

RESULTS

Chronic liver disease in infancy

For each patient, a detailed history was taken, these patients were subjected to basic investigations which included serological, virological, biochemical, radiological, endoscopic and histologic examination, other additional investigations were done according to the individual cases some of the tests to identify the primary metabolic disorder was not done because of in avalilablty.

Table (1) Prevalence of Cronic Liver Disease in infancy.

No. of patients	Percentage	Disease
4	50%	Extrahepatic biliary lesion
3	37.5%	Congenital metabolic liver disease
1	12.5%	Cryptogenic liver disease

Table (2) Clinical features and ultrasound findings of four infants with extrahepatic biliary disease.

Case no	Sex	Findings
1	F	Mild hepatomegaly. dilatation of intrahepatic biliary canaliculi. normal C.B.D*.
2	M	Hepatomegaly. Dilated intrahepatic biliary tree
3	M	Hepatomegaly, dilated intrahepatic and proximal extrahepatic syste. Extrahepatic bile duct obstruction
4	F	Mild hepatomegaly; poorly filled G.B**, difficult to identify C.B.D., dilated intrahepatic ducts

* C.B.D. = Common bile duct
** G.B. = Gull Bladder

Table (3) Clinical findings of infant patients with features suggestive of metabolic congenital liver disease.

Case no	Age	Sex	Presenting features	Liver biopsy
1	2m	F	Convulsion, hepatosplenomegaly	Focal moderate fatty changes, septal fibrosis
2	6m	F	Jaundice, hepatosplenomegaly	Extensive fatty changes
3	1y	M	Hepatosplenomegaly, pallor, fever	Macro and micronodular fatty changes with portal fibrosis suggestive of inborn error of metabolism

Cryptogenic liver disease

A 6 months male presented with hepatosplenomegaly and jaundice. His liver biopsy shows mild portal inflammatory process. Viral screen for hepatitis virus (A, B, C), toxoplasma, rubella, cytomegalo virus, herpes virus were negative.

Chronic liver disease in preschool age children

Table (4) Prevalence of chronic liver disease in preschool children aged (1-6 years)

Diagnosis	Number of cases	Mean age at presentation	Sex		Percentage
			M	F	
Hepatitis virus infection	4	3 y	3	1	18.2
Congenital metabolic liver disease	4	3.3 y	3	1	18.2
Wilson's disease	3	5 y	3	0	13.6
Budd chiari	2	5 y	1	1	9.1
Alagelle's syndrome	1	3 y	0	1	4.5
Cystic disease of the liver and kidneys	1	3 y	1	0	4.5
Cystic fibrosis	1	3 y	0	1	4.5
Cryptogenic	6	3.5 y	4	2	27.3
Total	22		15	7	100

Table (5) Clinical features of H.B.V. +Ve chronic liver disease

Case no	Age at presentation	Sex	Presentation & complication	Child Pugh score[3]	Liver biopsy	AST/ALT mg/dl
1*	2y	M	**Hepatosplenomegaly, Jaundice**	A.	C.A.H**.	36/52
2	3y	F	**Hepatosplenomegaly, Jaundice**	B.	---	75/300
3*	3.5y	M	**Hepatosplenomegaly, portal hypertention**	B.	---	22/36
4	6y	M	**Hepatomegaly, ascites**	B.	---	89/94

* Mother of those patients are also HBV +ve
** Chronic Active hepatitis

Table (6) Clinical features, complications, liver biopsy findings of congenital metabolic liver disease in preschool children aged (1-6 years)

Case no	Age at presentation	Sex	Child Pugh score	Clinical features & complications	Liver biopsy[6]
1	2y	M	A.	Hepatosplenomegaly, short stature	**Maintained liver architecture, swollen hepatocyte, contain pink material (P.A.S.+ve). Suggesive of inborn error of metabolism (glycogen storage disease)**
2	2y	M	B.	Short stature , huge hepatomeagaly, positive family history, urine for reducing substance was positive	**Fatty changes, focal fibrosis and focci of liver necrosis,suggesive of inborn error of metabolism**
3	3y	M	A.	Jaundice, hepatosplenomegay, hematemesis, PHT*	**Swollen hepatocyte, foamy appearance, P.A.S. Stain +ve, diastase sensitive C.W. Glycogen storage disease**
4	6y	F	B.	hepatosplenomegay, bleeding esophageal varices	**Macrovesicular fatty changes, P.A.S. stain +ve, hepatocyte diastase sensitive C.W. glycogen storage disease**

* Portal hypertention

Table (7) Clinical features and complications of Wilson's disease in preschool age (1-6 years) children

Case no	Age at presentation	Sex	K-F ring	Child Pugh score	Complications
1	4y	M	+Ve	C	Ascites, PHT**
2	5y	M	-Ve	C	Ascites, PHT, Hepatic encephalopathy, death
3*	6y	M	+Ve	C	Ascites, PHT, Hepatic encephalopathy, death

* Strong family history of Wilson's disease.
** Portal hypertention

Table (8) Clinical features of Budd chiari syndrome in preschool (1-6 years old) children

Case N0.	Age at presentation	Sex	Clinical features & complication	Child Pugh score	Underlying cause
1*	4y	F	Jaundice, ascites, hepatoencephalpathy, Jaundice	C	---
2*	6y	M	Huge ascites, hepatosplenomealy, Jaundice	A	Trauma to abdomen (car accident)[2]

* Both cases showed positive Doppler findings consistent with Budd Chiari syndrome.

Table (9) Miscellaneous causes of chronic liver disease in age group (1-6 years old)

Liver disease	Sex	Age at present-ation	Presenting features	Child Pugh score	Liver biopsy
Alagelle's syndrome[6]	F	3y	Characteristic facial appearance, tetralogy of Fallot, itching, jaundice	C	Bile ductopenia, portal tract monocyte infiltration
Cystic disease of the liver and kidney	M	3y	Huge hepatosplenomegaly, P.H.T. Cystic lesion of the liver and kidneys on abdominal U/S examination	B	---
Cystic fibrosis	F	6y	Meconium ilieus after birth, repeated chest infection, bulky offensive diarrhea, jaundice, P.H.T., High sweat sodium level	B	Chronic active hepatitis

Table (10) Cryptogenic chronic liver disease at age 1-6 years

Case N0.	Age	Sex	Presentation & complications	Liver biopsy
1	1.5y	M	Hepatosplenomegaly, ascites	Features of chronic active hepatitis
2	1.9y	F	Hepatomegaly	Baloon vacuated hepatocytes with macro and microvesicular fatty changes
3	2y	F	Hepatosplenomegaly,clubbing, ascites, P.V.T.*, P.H.T., hepatic encephalopathy	Liver cirrhosiss
4	4y	M	Hematemmesis, malena, hepatosplenomegaly, esophageal varices	C.A.H. With distorted liver architecture
5	6y	M	Jaundice, clubbing, hepatosplenomegaly, P.H.T.	Picture of C.A.H.
6	6y	M	Jaundice, ascitis, hepatosplenomegaly	Picture of C.A.H.

* P.V.T. = portal vein thrombosis

Discussion

The commonest cause of chronic liver disease in infancy (below 1year) was extrahepatic biliary disease. Diagnosis of specific causes was limited by the availability of other relevant investigations, such as H.I.D.A. scan most of these patients with extrahepatic biliary disease presented at late stage (beyond the optimal time of surgery).

The second common cause of chronic liver disease in infancy was congenital metabolic liver disease (in this study, the specific cause of congenital metabolic liver disease was not confirmed because of the inavailability of specific histochemical and biochemical tests, therefore this precluded from giving specific instruction and treatment.

For the preschool children (1-6 year). The commonest cause of chronic liver disease was viral hepatitis (4 patients were HBV) (18.2%). Some of these patients have their mothers positive for same viral infection (indicating perinatal vertical transmission). These patients were of the score A and B in Child Pugh score.

Regarding congenital metabolic liver disease (18.2%), most cases presented in Child Pugh score of A and B, specific causes were not identified for the above mentioned reasons. Wilson's disease was present in 3/22 patients (16.3%), those patients had advanced liver disease at the time of presentation indicating late diagnosis and delay in the treatment of potentially treatable disease. Budd Chiari syndrome can also be found in early childhood, therefore it should be looked for in investigating those patients. There was one case for each of the following: Alagelle's syndrome, cystic disease of the liver and kidney and cystic fibrosis.

On the available investigations of chronic liver disease, cryptogenic causes was the commonest diagnosis (27%) of chronic liver disease in preschool children.

Conclusion

This study shows that there are many congenital and inherited metabolic diseases can be treated if diagnosis was appropriately done at early stage. This can be done if specific biochemical and histological tests are available. Chronic viral hepatitis mainly HBV can occur in childhood which necessitate strict application of effective HBV vaccination program.

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