THE PATFERN OF ACUTE VIRAL HEPATITIS IN CHILDREN- A STUDY BASED ON SEROEPIDEMIOLOGY AND BIOCHEMICAL PROFILE

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Abstract

The study of pattern of acute viral hepatitis (AVH) in children revealed that hepatitis A was most common in children (59.3%) followed by NANB hepatitis (29.7 %). A dual infection with hepatitis A and hepatitis B was present in 4.4% of cases. Hepatitis A was more commonly diagnosed in younger children (54.9%) while the frequency of NANB hepatitis increased with the advancing age. Liver function tests in children were more disturbed in hepatitis A and NANB hepatitis as compared to hepatitis B. A seasonal variation (late summer and winter) was noticed in the occurrence of hepatitis A. Poor hygienic conditions, improper sanitation, overcrowding and the use of inadequately sterilized syringes are important factors in the transmission of all types of acute viral hepatitis in children (JPMA37: 314,1987).

INTRODUCTION

There has been a tremendous explosion of knowledge about acute viral hepatitis (AVH) in the last 15 years due to which three types of viral hepatitis have been recognised, namely hepatitis A, hepatitis B and non A, non B (NANB) hepatitis. The aetiological agents for hepatitis A and B, have been distinguished from one another by biophysical, morphological and serological means.[1-5] There is, however, an overlap of clinical characters of hepatitis A and B.[6]The aetiological agent(s) of non A, non B (NANB) hepatitis which occurs in two forms, namely, post-transfusion and sporadic or waterborne, has (have) not yet been identified and characterised despite efforts of a large number of workers. [7-9]
A wide variation is seen in the pattern of acute viral hepatitis in adults and children. This study was planned to find out the aetiological pattern of different forms of acute viral hepatitis in the northern part of Pakistan and to correlate it with. seroepidemiology and biochemical profile.

MATERIAL AND METHODS

The present study was carried out on children admitted to Paediatric Ward of an army hospital in Rawalpindi between July, 1985 to January, 1986.

Patients:

Niñety one Children (ages 1-15 years), admitted to paediatric ward with jaundice, high coloured urine, nausea and vomiting and a provisional diagnosis of acute viral hepatitis were included in the study. In each child a complete history was recorded and a thorough physical examination was carried out. An attempt was made to rule out other causes of jaundice like congenital biiary atresia, drugs, bacterial infections and other viruses like CMV and EBV.

Investigation:

Five ml of blood of each patient was drawn into vacutainers and on these sera, liver function tests which included biirubin, alkaline phosphatase (AP) and alanine aminotransferase (ALT) were performed. The seromarkers of acute viral hepatitis were evaluated by ELISA technique (Abbott

Laboratories, North Chicago, Illinois). The ELISA kits used were HAVAB-M (antiHAV 1gM), AUSZYME (HBs-Ag), CORZYME (anti-HBc) and HAVAB (anti-HAV) and the results were read on QUANTUM-Il (Abbott).

RESULTS

Of 91 children there were 61 males (67%) and 30 females (33%) ratio being 1.9:1. Most of the children were between the age of 1 to years (85.7%) and the majority (97%) belonged to lower socioeconomic group. A history of contact with a jaundice patient was present in 17.6% cases of hepatitis A and 3% of NANB hepatitis. About 4.4% children with NANB hepatitis and 1 .5% with hepatitis B revealed history of exposure to hypodermic needle/injections.

Type of Acute Viral Hepatitis

A infection was present in 59.3% and NANB in 29.7% cases (Figure).

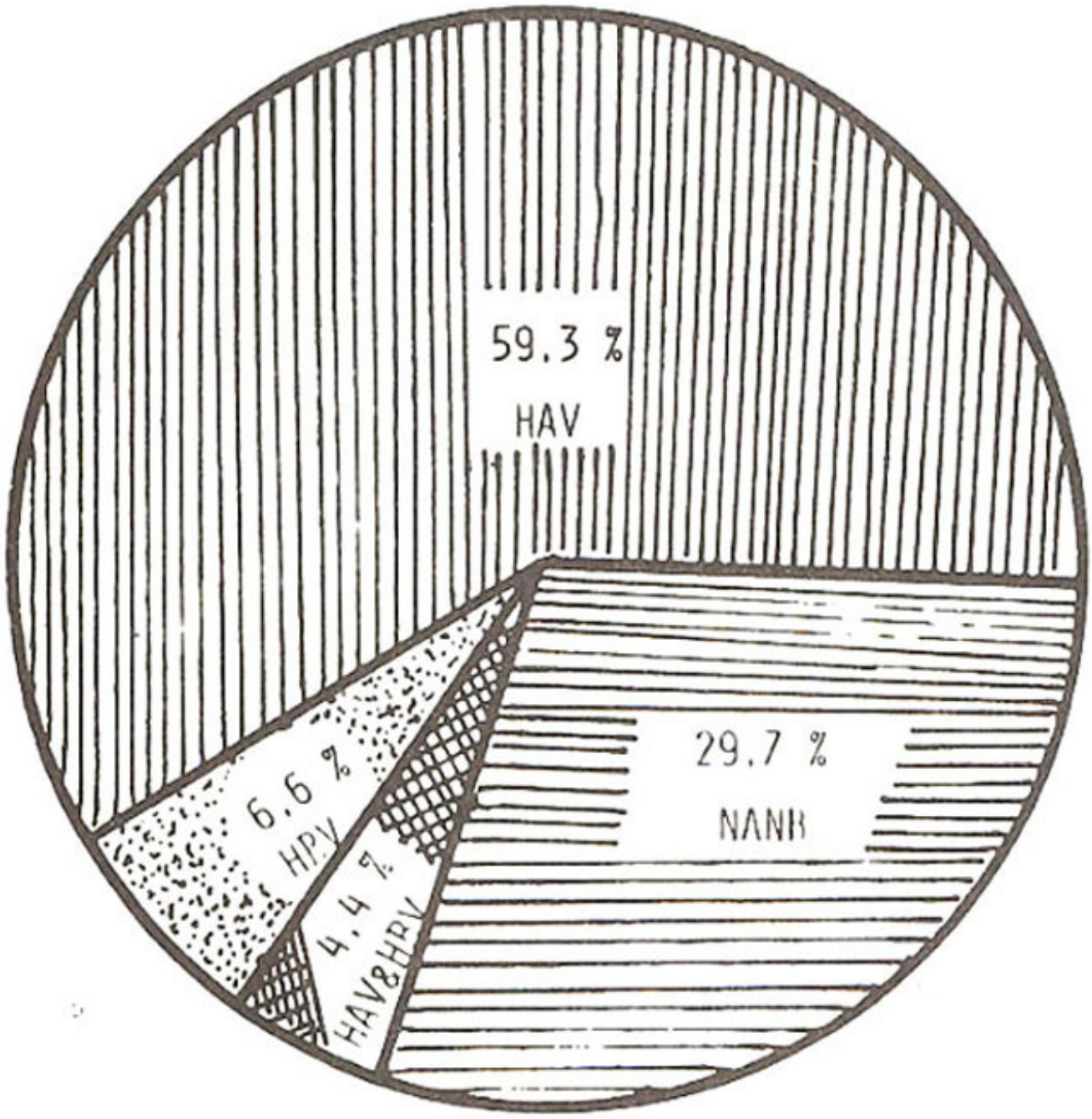

Figure. Aetiological pattern of A.V.H. in children.

Dual infection with hepatitis A and B was observed in 4.4% children (Table 1).

TABLE – I
Serologic Profile of Children with Dual Infection.

S.No.	Age (Yrs)	Sex	IgM Anti-HBc	HBsAg	IgM Anti-HAV
1.	2½	F	Positive	Positive	Positive
2.	8	F	Positive	Positive	Positive
3.	7	F	Positive	Positive	Positive
4.	2	M	Positive	Positive	Positive

Age Distribution of AVH.

Distribution of AVH according to Age and Sex

Hepatitis A was more frequent (54.9%) in younger children (1 to 9 years) and its frequency decreased with the increasing age (Table II).

TABLE – II
Age Distribution of AVH.

Age (Years)	No. of Cases	HAV No(%)	HBV No(%)	HAV & HBV No(%)	NANB No(%)
1 – 3	31	19 (61.3%)	1 (3.2%)	2 (6.5%)	9 (29.0%)
4 – 6	23	17 (73.9%)	1 (4.3%)	–	5 (21.8%)
7 – 9	24	14 (58.4%)	2 (8.3%)	2 (8.3%)	6 (25.0%)
10–12	6	1 (16.6%)	1 (16.6%)	–	4 (66.8%)
13–15	1	1 (100%)	–	–	–
Unknown ∠12	6	2 (33.3%)	1 (16.7%)	–	3 (50.0%)
Total cases:	91	54 (59.3%)	6 (6.6%)	4 (4.4%)	27 (29.7%)

NANB hepatitis was diagnosed less frequently (29.0%) in younger children between 1 to 3 years of age but its frequency increased in older age groups. All types of acute viral hepatitis (hepatitis A, B & NANB) were more frequent in males than females.

Liver Function Tests- Biochemical Profile

In hepatitis A serum biirubin levels ranged between 1.1 to 20.Omg/dl while mean ALT was 119 U/L (Table-III).

TABLE – III
Liver Function Test .

Type of Hepatitis	Number of Cases	Serum Bilirubin Mean (Range)	Alkaline Phosphatase Mean (Range)	SGPT (ALAT) Mean (Range)
		(mg/dl)	(U/L)	(U/L)
HAV	34	5.32 (1.1 –20.0)	134.38 (72-315)	119.03 (21 - 235)
HBV	5	3.36 (2.1 –4.8)	99.4 (68 - 146)	63.8 (18 - 88)
HAV & HBV	3	1.9 (1.1 –3.1)	86.67 (75 - 110)	58.0 (18 - 135)
NANB	16	6.43 (1.1-17.6)	127.63 (72 - 234)	135.75 (10 - 320)

The mean levels of bilirubin (64 mg/dl) and ALT (135 U/L) in NANB hepatitis were higher than in Serologic Profile of Children s~ith Dual Infection hepatitis A and B. The liver function tests as a whole were relatively more disturbed in hepatitis A and NANB, as compared to hepatitis B.

Seasonal Variation of AVH

The monthly frequency of acute viral hepatitis is given in Table-IV.

TABLE –IV
Monthly Distribution of Cases.

Months	No. of Cases	HAV No.(%)	HBV No.(%)	HAV & HBV No.(%)	NANB No.(%)
July 85	18	7 (38.8%)	1 (5.6%)	1 (5.6%)	9 (50.0%)
Aug 85	16	8 (50.0%)	2 (12.5%)	–	6 (37.5%)
Sep 85	18	13 (72.2%)	2 (11.1%)	–	3 (16.7%)
Oct 85	12	7 (58.4%)	1 (8.3%)	1 (8.3%)	3 (25.0%)
Nov 85	8	6 (75.0%)	–	–	2 (25.0%)
Dec 85	13	8 (61.5%)	–	2 (15.4%)	3 (23.1%)
Jan 86	6	5 (83.3%)	–	–	1 (16.7%)
Total cases	91	54 (59.3%)	6 (6.6%)	4 (4.4%)	27 (29.7%)

Hepatitis A was more prevalent in late summer and winter, compared to summer season, while NANB hepatitis revealed a downward trend with the onset of colder weather.

DISCUSSION

In recent years, the understanding of the nature of hepatitis A virus (HAV) and infectious hepatitis caused by it has sharply increased. It has been observed that age exerts significant influence on the frequency of clinical signs and symptoms of hepatitis A. The young children especially under the age of 2 years usually do not develop symptoms recognised to be related to hepatitis when infected with HAy. Only 4 to 16% of young children suspected of transmitting HAV infection to older members in a day care centre in US had symptoms of hepatitis[10] On the other hand, majority of adults (7 5%) who were infected with HAV developed overt clinical features of hepatitis. As hepatitis A mostly involves children in our country, this implies that majority of HAV infections in children being subclinical and anicteric remain unnoticed and the small number of overt infections which come to the attention of parents and clinicians just represents the tip of the iceberg.

The HAV may spread via contaminated water and food and common source epidemics have been described from the West[10] . As HAV mostly involves adults in Western countries, the risk factors in adults i.e., contact with other cases of hepatitis, homosexuality, foreign travel and contact with children attending day care centres differ there as compared to developing countries. In Pakistan, the young children are more frequently implicated in the transmission of HAV. The lack of toilet training and oral behaviour of putting every thing in the mouth apparently promotes HAV transmission among very young children who then spread the virus to older children and young adults.

Seroepidemiological studies carried out in US indicate that risk of HAV infection is related not only to age but to socioeconomic status also. Approximately 10 to 20% Americans have antiHAV antibody by the age of 20 years and 50% by 50 years.[11-12] On the other hand, in many developing nations like Pakistan a high seropreva. lence is observed early in life, indicating a high frequency of viral transmission related to poor hygienic conditions, overcrowding and inadequate sanitation in low socioeconomic groups. Consequently, 95% population in our country be. comes anti-HAV positive by the age of 15 years and overt acute HAV infection is uncommon in adults (personal observation). In the present study 97% children suffering from hepatitis A belonged to lower socioeconomic group. In a study of prevalence of hepatitis A virus infection in paediatric age group in India,. Gandhi et al[13] reported 68% children between 6 to 10 years positive for IgG anti-HAV suggesting the past exposure to hepatitis A virus. However, as efforts to improve sanitation meet with success in developing countries, the HAV infection could become less common and the mean age of acquiring infection also expected to rise.

The epidemiological evidence has established the existence of mother.to-child transmission of HBV, but the mode of infection is thought to be perinatal rather than in-utero infection[14,15]

As about 8% of pregnant females in our country are HBsAg carriers (personal observation), they may be a source of spread to their children. The frequent finding of HBsAg in saliva of chronic carriers of HBsAg suggests that kissing or orai contact may be a vehicle of transmission[16] In the present study 6.6% children had hepatitis B infection. The perinatal transmission from mother to infants or later infection transmitted from mouth by kissing or close physical contact along-with exposure to contaminated hypodermic needles used during injections and vaccination may be the contributory factors in the spread of HBV infection to children in our country. Hepatitis B virus infection is also endemic in countries such as Nigeria; Tabor and Gerety[17] detected HBsAg in 5% of Nigerian infants and evidence of HBV infection during infancy Was found to be as high as 28%. Some other investigators observed 83% HBsAg carrier rate in Nigerian children between ages of 4 to 12 years'[18]. From India, Tandon et al[19] found that 7% of sporadic acute viral hepatitis in children was attributed to HBV infection.

Joshi[20] reported 'that NANB infection in India was the second most common cause of sporadic acute hepatitis among children and the incidence was about half of that found in adult population. Our study tends to agree with these observations from India since NANB hepatitis was the second common type

of hepatitis seen in children (29.7%) in Pakistan.

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