A FOUR YEAR REVIEW OF ACUTE VIRAL HEPATITIS CASES IN THE EAST COAST OF PENISULAR MALAYSIA (1994-1997)

Zainah Saat, Mangalam Sinniah, Teh Leok Kin, Raudzah Baharuddin and Mariammah Krishnasamy

Virology Division, Institute for Medical Research, Jalan Pahang, 50588 Kuala Lumpur, Malaysia

Abstract. A total of 1,157 sera from jaundiced patients with clinical and biochemical evidence of liver disease received from government hospital in Kelantan and Terengganu, during the period from 1994 to 1997, were investigated to determine the cause. Hepatitis A virus was found to be the main cause in 26.1% (24/92) of symptomatic clinical hepatitis cases in 1994, 47.8% (63/132) in 1995, 66.4% (613/923) in 1996 and 20% (2/10) in 1997. Sera received in 1996 were also tested for hepatitis B, hepatitis C, hepatitis D and hepatitis E. 1.4% (13/923) anti-bodies were found to be positive for HBc IgM indicating recent HBV infection, 5.4% (50/923) for total HCV Ab, 0.9% (8/923) for total HDV Ab and 0.4% (4/923) for anti-HEV IgM. This study shows that HAV is still a major problem in Kelantan and Terengganu, and there is a need to identify effective strategies for prevention and control in these two states.

INTRODUCTION

Hepatitis is a term used for inflammation of the liver and there are a number of causative agents that can give rise to this condition, for example, drugs, toxins, viruses, bacteria and parasites. Of these, viruses are the most common causative agents of acute hepatitis. Many viruses infect the liver of man and some of these viruses can give rise to severe liver disease. Five major types of viral hepatitis have been identified, hepatitis A virus (HAV), hepatitis B virus (HBV), hepatitis C virus (HCV), hepatitis D virus (HDV) and hepatitis E virus (HEV) with hepatitis A being the most prevalent in the developing world (Hollinger *et al*, 1996; CDC Travel Information, 1996). HAV is highly contagious and has a worldwide distribution. The most common mode of transmission is through feco-oral route, contaminated food and water acting as vehicles of HAV transmission. HAV infection rates are highest in developing countries. Our country, Malaysia is a developing nation and the HAV prevalence has been classified as being of intermediate rate. A three year study (1987-1989) by Ooi *et al* (1992) has shown that HAV was the most common cause of acute viral hepatits in Malaysia with Kelantan having the highest incident of HAV cases.

Clinical presentations, pathological changes and biochemical tests are almost similar in all acute cases of hepatitis A, B, C, D and E. Therefore, they are not reliable for the diagnosis of individual patients with jaundice. Serological tests allow precise diagnosis of acute hepatitis and should be used widely because viral hepatitis is often diagnosed when jaundice is actually caused by other etiological agents. The objective of this study was to identify the etiological agents of acute hepatitis in the states of Kelantan and Terengganu from 1994 to 1997.

MATERIALS AND METHODS

All serum samples received from government hospitals throughout the country between 1994 to 1997 from jaundiced patients with clinical and biochemical evidence of hepatitis which fit the Center for Disease Control Criteria for hepatitis (clinical symptoms or signs of viral hepatitis and serum aminotransferase activity greater than 2.5 times the upper limit of normal) were screened for hepatitis A. Samples received in 1996 from Kelantan and Terengganu which were found to be negative for hepatitis A were screened also for HBV, HCV, HDV and HEV.

HAV: Anti-HAV IgM was detected by enzyme immunoassay (EIA) using commercial kit HAVAB-M EIA from Abbot Laboratories (Chicago, Illinois).

HBV: HbsAg and anti-HBc IgM was detected by EIA using commercial kit Imx System for HbsAg and CORE™-M respectively from Abbot Laboratories (Chicago, Illinois).

HCV: Anti-HCV Ab was detected by EIA using commercial kit Imx System for HCV from Abbot Laboratories (Chicago, Illinois).

HDV: Total anti-HDV Ab was detected by EIA using commercial kit Hepanostika® HDV from Organon Teknika (Netherlands).

HEV: Anti-HEV IgM was detected by EIA using commercial kit HEV-IgM from Genelabs Diagnostics (Singapore).

RESULTS

From 1994 to 1997 the Virology Division, IMR received a total of 4,355 sera samples from hospitalized acute hepatitis patients. There were 1,016 (23.3%) patients with acute viral hepatitis in 1994, 923 (21.2%) patients in 1995, 2,043 (46.9%) patients in 1996 and 373 (8.6%) patients in 1997 Fig 1. Except for 1996, most (898) of the acute hepatitis cases were from Kuala Lumpur. In 1996, 45.2% (922/2043) cases were from Kelantan and Terengganu (Fig 2).

Among these 4,355 cases, HAV was found to be the etiological agent in 15.7% (160/1016) in 1994, 18.3% (169/923) of cases in 1995, 41.4% (845/2,043) of cases in 1996 and 15.5% (58/373) in 1997 (Fig 3).

Geographically, except for 1996, the cases were fairly well distributed throughout all the states in Malaysia (Fig 4). In 1996, 72.5% (613/845) of the HAV cases were from Kelantan and Terengganu. For Kelantan and Terengganu, HAV was found to be the etiological agent in 26.1% (24/92) symptomatic clinical hepatitis cases in 1994, 47.8% (63/132) in 1995, 66.4% (613/923) in 1996 and 20% (2/10) in 1997 (Table 1).

55% (338/613) of the Kelantan and Terengganu HAV cases were children between the ages of 6-15 years; followed by 16.0% (98/613) in the 16-20 years age group and 11.6% (53/613) for the 21-25 years age group (Fig 5). For 1996, the number of confirmed HAV cases were high from April to December (Fig 6).

Of the 218 HAV IgM negative sera from Kelantan and Terengganu, 17.4% (38/218) were positive for HBs Ag. These were further tested with anti HBc IgM and total HDV AB of which 6.0% (13/218) and 3.7% (8/218) were found to be positive for anti HBc IgM and total HDV Ab respectively. The 218 sera were also tested for total HCV Ab and anti-HEV IgM, 23.0% (50/218) were found to be positive for HCV Ab and 0.5% (4/218) for anti-HEV IgM.

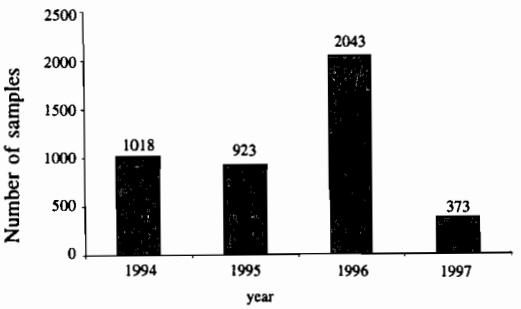

Fig 1–Number of suspected acute viral hepatitis cases investgated in 1994, 1995, 1996 and 1997.

DISCUSSION

Several studies to determine the HAV infection rates in Malaysia have been reported by Ton *et al* (1983), Tan *et al* (1986). As shown in earlier studies HAV is still the most common cause of viral hepatitis in this country with an oveall incidence of 28.3% (1,232/4,355) from 1994 to 1997. In this study HAV was present in 15.7% of acute hepatitis cases in 1994, 18.3% in 1995, 41.4% in 1996 and 15.5% in 1997. Except for 1996, there was no significant different ($p>0.2$) in the proportion of acute hepatitis cases diagnosed as HAV annually. These figures are much

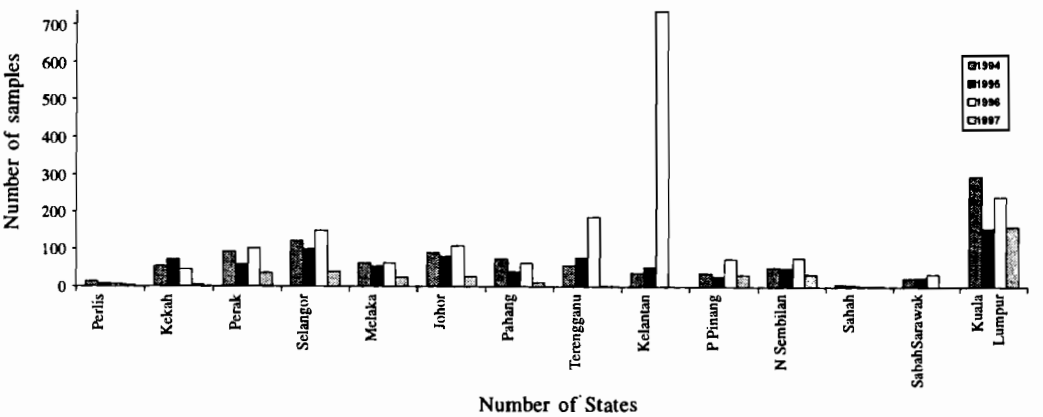

Fig 2–Number of suspected acute viral hepatitis cases investgated/reported by States in years 1994-1997.

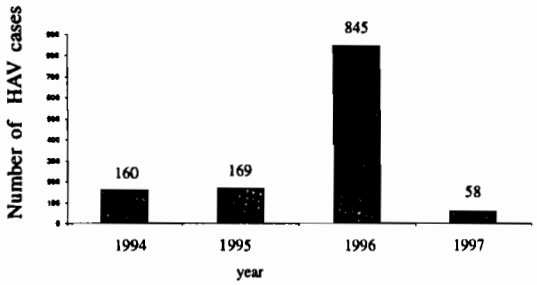

Fig 3–Number of confirmed HAVcases form 1994-1997.

In this outbreak the highest attack rates was in schoolgoing children between the 6-15 years of age (55.0%), this is probably due to entering of school with increased social contact and thus increased opportunity for HAV transmission. The schoolgoing children has also been shown to be most affected in the previous studies by Ooi *et al* (1992).

Of the 232 HAV IgM negative cases from this outbreak only 218 were found to be adequate for further testing. Of the 218 cases, 17.4% (38/218) were positive for HBs Ag. These were further tested with anti-HBc IgM of which 6.0% (13/218) were found to be positive indicating recent HBV infection. 3.7% (8/218) cases were positive for total HDV Ab indicating recent or active HDV infection, 23.0% (50/218) cases were positive for total HCV Ab indicating either active/recent or past exposure to HCV infection and 0.5% (4/218) for anti-HEV IgM indicating recent HEV infection.

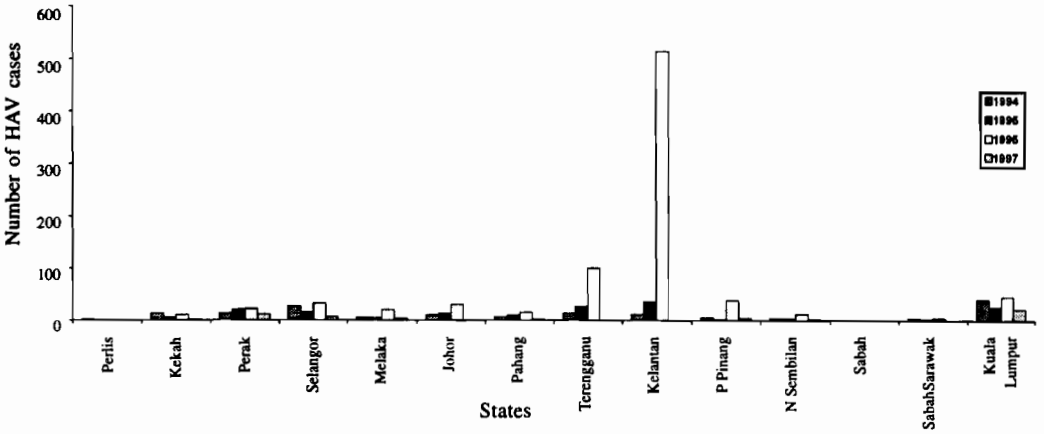

Fig 4–Annual symptomatic clinical hepatitis A cases from 1994-1997 according to States.

Table 1
Annual symptomatic clinical hepatitis A cases from 1994-1997 for Kelantan and Terengganu.

Year	No. tested	No. (%) positive
1994	92	24 (26.1)
1995	132	63 (47.8)
1996	923	613 (66.4)
1997	10	2 (20.0)

lower than the 33.0% reported by Ton *et al* (1983) and 46.1% (513/1,113) by Ooi *et al* (1992). Our findings are comparable to the 11% reported by Tan *et al* (1986).

Our restropective analysis shows there was an outbreak of hepatitis A in Kelantan and Terengganu for the year 1996 since there was a significant increased ($p<0.001$) in the number of HAV cases in 1996 and 72.5% of these cases were from Kelantan and Terengganu. The proportion of acute hepatitis cases diagnosed as having HAV infection in Kelantan and Terengganu was 66.4% for 1996. This proportion is so much higher than the 26.1% for 1994, 47.8% for 1995 and 20.0% for 1997.

This study shows that HAV is still a major problem in Kelantan and Terengganu. To prevent further outbreak, there is a need to identify effective strategies for prevention and control of hepatitis A in these two states. Districts with high endemicity must be identified and since the highest attack rate is in the schoolgoing age group, preschool HAV vaccina-

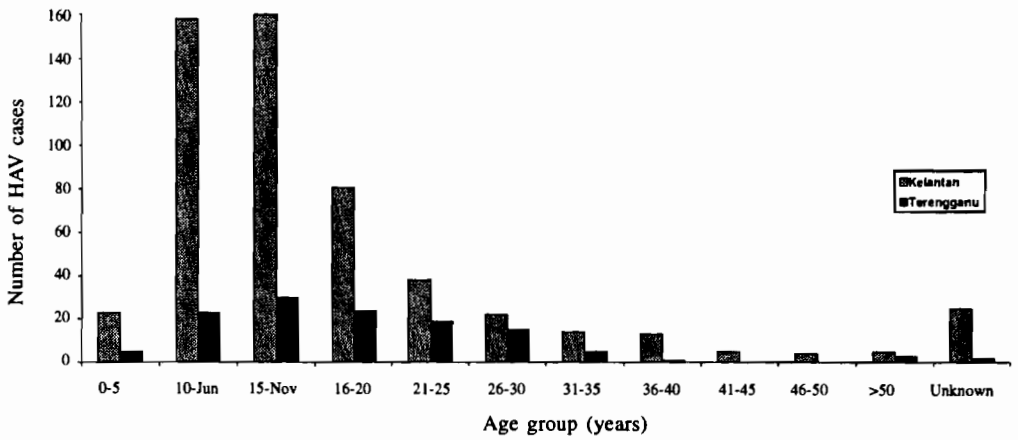

Fig 5–Age distribution of HAV cases in Kelantan and Terengganu.

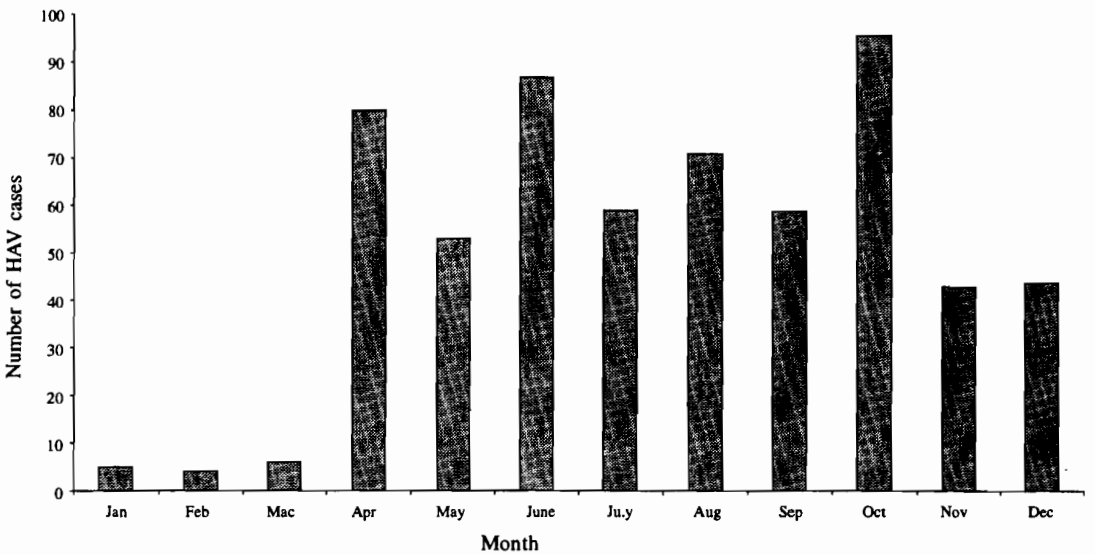

Fig 6–Number of HAV cases in 1996 for Kelantan and Terengganu.

tion program can be considered as one of the control measures.

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