LIVER DYSFUNCTION IN DENGUE INFECTION, AN ANALYSIS OF THE PREVIOUSLY PUBLISHED THAI CASES

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Background: Dengue infection is a major vector-borne disease. The classical sings and symptoms of this infection include high fever, violent headache, chill and rash. However, there are a number of atypical forms of dengue infection including those presented with liver dysfunction. However, there are only a few reports concerning the liver dysfunction among the patients with dengue infections. **Methods:** Here, the author presents a summative study on the liver dysfunction and its clinical correlation among Thai patients in the previous studies. A literature review on the prospective studies concerning liver function and dengue infection in Thailand was performed. **Results:** According to this study, there are 4 reports included covering 191 Thai pediatric patients with dengue infection. The overall rate of liver dysfunction among 191 subjects is 34.6 % (66/191). The rate of liver dysfunction among the patients without shock (36/120) is not significant different from those with shock. The rate of liver dysfunction in this study is considerable high, similar to the previous reports from other developing Asian countries. In addition, about 8 % (5/66) the patients with liver dysfunction developed hepatic encephalopathy. **Conclusions:** This can imply the importance of detection of abnormal high transaminase enzyme among the patients with dengue infection since the consequently developed hepatic encephalopathy can be expected.

Key words: Dengue, Liver, Dysfunction

INTRODUCTION

Dengue infection is a major public health problem, affecting children in the Southeast Asia Region. Up to 2-3 epidemics per year have been reported[1]. The classical form of this infection has an incubation period of 5-8 days following by the onset of fever, violent headache, chill and rash developing after 3-4 days. The fever usually lasts 4-7 days and most people had a complete recovery without any complication[2-4]. However, there are a number of atypical forms of dengue infection including those presented with liver dysfunction.

Although liver is not the target organ of dengue virus, several liver pathological findings including fatty change, centrilobular necrosis, and monocyte infiltration in the portal tract, is reported[5]. However, there are only a few reports concerning the liver dysfunction among the patients with dengue infections. In addition, most reports are retrospectively focused on cases with severe abnormal liver functions. Here, the author presents a result from retrospective analysis on the liver dysfunction and its clinical correlation among Thai patients in the previous studies.

MATERIAL AND METHODS

The objective of this study is to analyze the characteristics of liver dysfunction and its clinical correlation among Thai patients in the previous published studies. A descriptive retrospective study on the secondary data from previously published documented was performed. A literature review on the prospective studies concerning liver function and dengue infection in Thailand was performed. The author performed the literature review from database of the published works cited in the Index Medicus and Science Citation Index. The author also reviewed the published works in all 256 local Thai journals, which is not included in the international citation index, for the report of human dengue infection in Thailand. Reports that did not contain complete data or lacked the data on the rate of liver dysfunction among the patients with dengue infection were excluded. Details of rate of liver dysfunction as well as clinical correlation (including consequent complications and outcome) in all included reports were summarized. The operative definition used for liver dysfunction in each study was having serum alanine transaminase (ALT) or aspartate transaminase (AST) level more than 200 U/L. Descriptive statistics were used for analysis of basic clinical and laboratory parameters. The segregation of cases on basis of shock was performed. Comparative analysis on their frequency was performed by proportional T test. Statistical significant level was set at P value ≤ 0.05. All the statistical analyses in this study were made using SPSS 7.0

RESULTS

According to this study, six prospective reports on the liver dysfunction among the Thai population were

detected. Two reported [10-11] were excluded due to lack of reported rate of liver dysfunction. After exclusion, there are 4 included reports[6-9] covering 191 Thai pediatric patients with dengue infection (Table 1). The rate of liver dysfunction among the patients in each report is presented in Table 2. The overall rate of liver dysfunction among 191 subjects is 34.6 % (66/191). The rate of liver dysfunction among the patients without shock (36/120) is not significant different from those with shock (30/71) (proportional T test, P=0.35). The consequent complications and outcome among those cases with liver dysfunction are shown in Table 3. Hepatic encephalopathy is detected in 5 cases (2.6 %). However, no fatal cases were noted.

Table 1. Reports on the liver dysfunction among Thai patients with dengue infection. (n=191)

Reports	Setting*	Number of patients		
		Without shock	With shock	Total
Punnapanich[6]	Central	24	6	30
Attavinijtrakarn [7]	Central	68	27	95
Ukarapol [8]	Northern	0	26	26
Sattayapisan [9]	Southern	28	12	40

*classified by regions of Thailand (there are 5 regions: central, northern, northeastern, southern and eastern)

Table 2. Rate of liver dysfunction among Thai patients in different reports. (n=66)

Reports	Number of patients with liver dysfunction (%)		
	Without shock	With shock	Total*
Punnapanich [6]	5 (22.2 %)	02 (33.3 %)	07 (23.3 %)
Attavinijtrakarn [7]	7 (10.3 %)	6 (22.2 %)	13 (13.7 %)
Ukarapol [8]	N/A	13 (50 %)	13 (50 %)
Sattayapisan [9]	24 (85.7 %)	09 (75 %)	33 (82.5 %)

* rate of liver dysfunction is not correlated to the setting of the study (Chi square test, P > 0.05)

** N/A means not available; this report[8] is not included when test for the difference of proportion between the subjects with shock and without shock

Table-3: Consequent complications and outcome among those cases with liver dysfunction

Reports	Rate* (%)	
	Hepatic encephalopathy	Death
Punnapanich [6]	0	0
Attavinijtrakarn [7]	38.5	0
Ukarapol [8]	0	0
Sattayapisan [9]	0	0

* rate corresponding to those cases with liver dysfunction

DISCUSSION

Dengue hemorrhagic fever (DHF) is an important cause of morbidity in South-east Asia and used to occur almost exclusively in young children. According to the recent retrospective study of Wichman et al among Thai patient in 2001 outbreak, the liver dysfunction can be seen in 20 from 347 patients (5.8 %) with dengue infection[12]. In 2004, Chen HC et al reported that strong correlation was found between T cell activation and hepatic cellular infiltration in immunocompetent mice infected with dengue virus [13]. They noted that the kinetics of liver enzyme elevation also correlated with that of T cell activation and suggested a relationship between T cell infiltration and elevation of liver enzymes[13]. Here, the author summarizes the reported rate of liver dysfunction among the previous prospective studies on Thai patients with dengue infection.

According to this study, nearly three-tenths of all subjects presented liver dysfunction. This rate is considerable high, similar to the previous reports from other developing Asian countries (ranging from 30 % to 90 %)[14-16]. In this study, it can be seen the rate of liver dysfunction among the cases with shock (37.8%) is slightly non-significant higher than the rate of those without shock (30.7%). This result is concordant with a recent report of Pancharoen et al that the average level of transaminase enzyme was slightly higher than those who had more severe dengue infections [10].

CONCLUSION

Concerning the outcome among the patients with liver dysfunction, the author hereby identify that about 8 % (5/66) of the cases presented hepatic encephalopathy. This can imply the importance of detection of abnormal high transaminase enzyme among the patients with dengue infection since the consequently developed hepatic encephalopathy can be expected.

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