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Research Note

Seroprevalence of anti-amoebic antibody among blood donors by indirect hemeagglutination assay

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Abstract. The screening for anti-amoebic antibody among a group of donors was to obtain negative control serum samples for an on-going antigen development assay in diagnosis of amoebic liver abscess. Out of 200 samples, 125 (62.5%) were negative, whereas 44 (21.5%) had IHA titer of less than 1:128 and 31 (16.0%) of the samples had significant IHA titers of 1:128 or more, in which 2 serum samples gave titers of 1:4096.

The north-eastern state of peninsular Malaysia, Kelantan faces the South China Sea in the east and shares its border with Thailand in the north. It occupies an area of 15 020 sq. km and has a population of 1 478 800. Kelantan state is endemic for water-borne diseases, in which the overall incidence was less than 5 per 100 000 people from 2000 till 2004. The incidence of typhoid/paratyphoid in year 2004 was 1.87 per 100 000 population whereas the incidences of cholera, hepatitis A and dysentery were lower and accounted for 0.35, 0.42 and 0.43 per 100 000 population respectively (Ministry of Health Malaysia, 2004). Thus, according to the above figure, the estimated incidence of dysentery for this state is 6.36.

Though many pathogens cause dysentery, the prevalence of amoebiasis differs according to age, socioeconomic status and geographical distribution. There was no available data from previous publication on the background seropositivity of amoebiasis among healthy population in Malaysia. In Malaysia, blood donors are considered healthy adults aged more than 18 years, weighing more than 50 kg, clinically healthy and are seronegative for HIV, hepatitis B and C, syphilis and malaria. The screening for anti-amoebic antibody among this group of donors was to obtain negative control serum samples for an on-going antigen development assay in diagnosis of amoebic liver abscess. The serum samples were first screened by indirect hemagglutination assay (IHA), then followed by IHA titrations to select serum samples with titer of 1:64 or more, which were considered positive for amoebiasis, as suggested by the manufacturer (Dade-Behring Marburg, Germany).

Two hundred pooled serum samples from blood donors were screened by IHA; 125 (62.5%) were negative, whereas 44 (21.5%) and 31 (16.0%) had IHA titer of less than 1:128 and 1:128 or more titer respectively (Table 1). Detection of lower titers among blood donors could be due to previous exposure to amoebiasis among the local healthy population with either intestinal or extraintestinal forms. Thirty one

Table 1. Distribution of groups by IHA titers (n=200)

IHA titers	Number (percentage)
Negative	125 (62.5)
Less than 1:128	44 (21.5)
1:128 and more	31 (16.0)

Table 2. Distribution of IHA titers among the blood donors (n=200)

IHA titers	Number (percentage)
Negative	125 (62.5)
1:16	27 (13.5)
1:32	9 (4.5)
1:64	8 (4.0)
1:128	17 (8.5)
1:256	8 (4.5)
1:512	2 (1.0)
1:1024	2 (1.0)
1:2048	0 (0.0)
1:4096	2 (1.0)

(16.0%) of the samples had significant IHA titers of 1:128 or more, in which 2 serum samples gave titers of 1:4096 (Table 2). In these cases, the possibility of having some forms of amoebiasis at the time of blood donation could not be ruled out, neither the likelihood of being asymptomatic carriers.

In another report, the seroprevalence of villagers from West Kalimantan, Borneo who had IHA titers equal or greater than 1:128 was 7% (Cross *et al.*, 1976) as compared to this study which was 16.0%. The seroprevalence of blood donors from urban, suburban and rural population of Puebla State, Mexico which was done using IHA alone was 8.6% whereas when IHA and ELISA were employed together, as recommended by WHO, the seroprevalence was 6.4% (Sánchez-Guillén *et al.*, 2000).

Lower IHA titers had been demonstrated in patients with amoebic liver abscess (ALA) who were admitted to our hospital. In a previous study, 27.6% (16/58) ALA patients had antibody titer of 1:256 or less (Zeehaida *et al.*, 2008). The lower titers found in these patients could be due to low antibody levels in the early course of the disease.

The seroprevalence of amoebiasis among blood donors in this study was higher as compared to those reported previously in Malaysia and other surrounding endemic regions. The finding showed that the background seropositivity is significantly high among healthy population in this local setting. A lower titer of 1:128 could not be taken as a positive titer since it overlapped significantly with titers found among the blood donors. Thus, the titer had less value for diagnosis of extraintestinal amoebiasis. Supported by the clinical symptoms and signs of amoebiasis, 1:256 is deemed a significant titer for diagnosis of the disease, particularly in this local setting.

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