

Scrub Typhus Seroprevalence in Healthy Indian Population

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ABSTRACT

Scrub typhus, a zoonosis caused by *Orientia tsutsugamushi*, is an important cause of acute febrile illness in India. This preliminary study determines the seroprevalence of scrub typhus in healthy Indian adults by measuring IgM and IgG antibodies to scrub typhus by ELISA in 100 healthy blood donors. Our study demonstrates a 15% seroprevalence of scrub typhus in adults. Further studies are needed to confirm these findings especially in children.

Keywords: Antibody, Blood donor, ELISA, *Orientia tsutsugamushi*

INTRODUCTION

Scrub typhus, a zoonosis, caused by *Orientia tsutsugamushi*, is widely prevalent in the Asia-Pacific region [1]. It is transmitted by the bite of the larval trombiculid mite of the *Leptotrombidium* genus. The pathognomonic lesion, eschar, is present in 43.5% of patients [2]. Most patients present as an acute undifferentiated febrile illness and laboratory confirmation is essential. Currently, serology continues to be the mainstay for diagnosis of scrub typhus.

There are different studies on prevalence of scrub typhus among patients with acute febrile illness, but to the best of our knowledge no study has been done on the seroprevalence of the disease in the healthy population in India.

In this study, we determined the IgM and IgG antibodies to scrub typhus in the serum amongst healthy adults.

MATERIALS AND METHODS

The study was conducted in Christian Medical College, Vellore, a tertiary care centre in Southern India in January 2013. With the approval of the Institutional Review Board, plasma from 100 healthy voluntary blood donors, were collected and tested for IgM and IgG antibodies to scrub typhus by ELISA (InBios International Inc., Seattle, WA, USA). The blood donors were all adult individuals (≥ 18 years) with a body weight of ≥ 45 Kg, not infected with HIV, Hepatitis B, Hepatitis C, malaria or syphilis and without any acute illness in the past 30 days. The blood donors were neither regular hospital visitors nor were they professional donors but were relatives of patients requiring blood transfusion. The tests were performed as per manufacturer's instructions and an OD (optical density) more than or equal to 0.5 was taken as positive. To extrapolate the results of plasma antibodies to scrub typhus, sera from 20 randomly selected donors were tested for IgM and IgG antibodies to scrub typhus.

RESULTS

All the 100 healthy blood donors were negative for IgM antibodies to scrub typhus while 15 had IgG antibodies (OD ≥ 0.5) when tested by ELISA for scrub typhus. The OD values for IgM antibodies had a range of 0.001 to 0.428 (mean=0.072). The population without IgG antibodies had OD values of 0.093-0.459 (mean=0.176), while those with IgG antibodies had OD values of 0.542-3.144 (mean=1.496). Serum and plasma samples of 20 of these healthy adults showed similar OD values.

The age of the population was between 18 to 45 years (mean=34.33). In the study group there were 29 (29%) females and 71 (71%) males.

Among the IgG positives, there were 3 (20%) females and rest 12 (80%) were males. So among the individuals not having antibody to scrub typhus there were 26 (30.6%) females and 59 (69.4%) males.

DISCUSSION

Scrub typhus is a common cause of acute febrile illness in India. A study done in Vellore, India stated that the prevalence is 47.5% [1], while another one in Tirupati, India, suggests the prevalence as 58.21% [3] among febrile patients. The present study provides data on the seroprevalence of scrub typhus in voluntary blood donors at a tertiary care centre in Vellore, Tamil Nadu, India.

In a study by Tay et al., in Malaysia, the seroprevalence in the community among different aboriginal groups was found to be 17.9% [4]. In another study in Malaysia, the seroprevalence among blood donors was 5.4% while that among febrile patients was 43.5% [5]. In our study, we found the seroprevalence of scrub typhus to be 15% among blood donors. The results obtained for the tests done on plasma can be extrapolated for serum as both had similar OD values. It is lower than the findings of a study done in healthy adults in Vientiane City, Lao PDR where the seroprevalence of scrub typhus was 20.3% [6] whereas the incidence amongst healthy farmers in Tianjin was reported to be 39.8% by Zhang Y and associates [7].

CONCLUSION

We conclude from this study that there is 15% seroprevalence of scrub typhus among blood donors in India. However, this needs to be evaluated in larger prospective studies on scrub typhus seroprevalence, especially amongst those at higher risk in the community.

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