ABSTRACT: AIM: To determine the baseline titre of brucella agglutinins, amongst apparently healthy blood donors in Trichy, Tamilnadu, India. MATERIALS AND METHODS: Blood samples were collected from healthy blood donors (n=566) who attended the blood bank of Chennai Medical College Hospital and Research Centre, Trichy, Tamil Nadu, from August 2010 –August 2011 and they were analyzed for the presence of brucella agglutinins by using a rapid slide agglutination test (Plasmatec Laboratory products, U.K.). RESULTS: Among the 566 serum specimens which were tested, 150(26.5%) and 218 (38.5%) serum samples were positive for B. melitensis, B.abortus agglutinins (1> in 20) respectively. Only 4 sera showed very high titre (1:160). CONCLUSION: Based on the above results of our study, it is evident that the baseline titre of 1:40 for B.melitensis and of 1:20 for B.abortus agglutinins in Trichy region of Tamilnadu. KEYWORDS: Brucellosis, Baseline titre, Seroprevalence, agglutinins.

INTRODUCTION: Brucellosis is an infectious disease of animals (zoonosis) that is transmittable to humans. Wild and domestic animals are the only source of brucellosis and humans are always accidental hosts. Brucellosis has major economic ramifications due to time lost by patients from normal daily activities and losses in animal production 1. The reported incidence of human brucellosis worldwide in endemic areas varies widely, from <0.01 to >200 per lakh population. The disease has a worldwide distribution with higher prevalence in Middle East, Mexico, Central and South America and the Indian subcontinent 2. It is acquired by direct or indirect contact with the infected animals and their products. It manifests as an acute, subacute and chronic disease involving any organ or organ system. Signs and symptoms of brucellosis are protean in nature and clinical diagnosis is often difficult. An unexplained fever is one of the indications of brucellosis and brucella agglutination test is one of the screening panels of pyrexia of unknown origin (PUO) 3. In the absence of culture isolation of Brucella, serological investigation of the patients is of vital importance for diagnosis and future management of patient. Therefore the main objective of this study was to determine the baseline titre and to define the significant titre for the diagnosis of brucellosis in single serum, in Trichy region, Tamilnadu, India.

MATERIALS AND METHODS: The prospective study was carried out in Department of Microbiology, Chennai Medical College Hospital and Research Centre, Trichy during August 2010 to August2011. After obtaining verbal consent, non-repetitive blood samples were collected from healthy blood donors (n=566) of both sexes, in the age group of 18-56 years, who attended our blood bank. Amongst whom, 524 (92.6%) were males and 42 (7.4%) were females. Those with the recent history of fever were excluded from the study.
All the blood samples were analyzed using rapid slide agglutination test. The antigens (Febrile Antigen Kit) were supplied by Plasmatec Laboratory products, U.K. The tests were carried out as per the protocol provided by the manufacturers, which included positive and negative controls. Eighty µl of undiluted serum sample was put on each side of a glass slide, to each of which a drop of the Brucella abortus and Brucella melitensis colored antigen suspension were added and rocked gently for 1 minute. Macroscopic agglutination occurring instantaneously was considered as strongly indicative of a positive reaction (1:20). All the positive sera were semi quantitatively tested (using 40 µl, 20 µl, 10 µl, 5 µl of undiluted serum) for the determination of antibody titre. The results were analyzed and interpreted as per the standard guidelines. The titre was taken as the highest dilution of serum with a visible agglutination.

RESULTS: Of 566 serum samples, 524 (92.6%) were males and 42 (7.4%) were females. Table -1 demonstrates results of the sera with end titres in healthy blood donors.

<table>
<thead>
<tr>
<th>Antigen</th>
<th>No. of positive samples (%)</th>
<th>Titre (1:20)</th>
<th>Titre (1:40)</th>
<th>Titre (1:80)</th>
<th>Titre (1:160)</th>
<th>Titre 1:320</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. melitensis</td>
<td>150(26.5)</td>
<td>42(7.4)</td>
<td>64(11.3)</td>
<td>42(7.4)</td>
<td>2(0.4)</td>
<td>0</td>
</tr>
<tr>
<td>B. abortus</td>
<td>218(38.5)</td>
<td>118(20.8)</td>
<td>58(10.8)</td>
<td>40(7.1)</td>
<td>2(0.4)</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 1: Number and percentage of sera with end titres in healthy blood donors

Out of 566 sera, 150(26.5%) and 218 (38.5%) serum samples were positive for B. melitensis, B.abortus agglutinins (1> in 20) respectively.

The agglutinins to B.abortus were the most prevalent among the sera of various dilutions which were tested. Table-1 depicts that the distribution of 150 samples(26.5%) with B.melitensis agglutinins, 42 (7.4%) had a titre of 1:20, 64 (11.3%) had a titre of 1:40, 42(7.4%) had a titre of 1:80 and 2 (0.4%) had the highest titre of 1:160.Similarly, among the 218 (38.5%) sera, which showed B.abortus agglutinins, 118(20.8%) had a titre of 1:20, 58 (10.8%) had a titre of 1:40, 40 (7.1%) had a titre of 1:80 and 2(0.4%) had the highest titre of 1:160.

DISCUSSION: Human brucellosis is a disease endemic in most of the regions of our country, manifesting as acute, subacute and chronic disease. The occurrence of subclinical infections and atypical presentations makes the clinical diagnosis of human brucellosis very difficult and therefore the laboratory aid is essential. Hence Brucella culture is cumbersome, hazardous and most of the laboratories lack culture facilities, serological tests play a major role in diagnosis.

The reported prevalence and incidence varies from country to country. The transmission of this infection and its endemicity in a particular area depends upon several factors like food habits, methods of processing milk and milk products, social customs, husbandry practices, socioeconomic status and environmental hygiene. Due to its varied manifestations, there should be a high index of clinical suspicion for the definitive diagnosis of brucellosis.

From Table-1, it has been evident that the baseline titre for B.melitensis and B. abortus is 1:40, and 1:20 respectively. Hence the baseline titre of a particular area must be known and should be updated with time. The most likely reason for the very high seropositivity in our study is that our
hospital is located in a rural area where agriculture is the main occupation and occupational exposure occurs to farmers, milkmen and cattle breeders.

Vaishnavi et al and Nagarathna et al reported a very low sero prevalence among blood donors at Chandigarh (0.36%) and Bangalore (1.1%) 4,3. Mangalgi S et al reported a high prevalence (5.91%) among the blood donors of Maharashtra 5. A very low prevalence (0.33%) among blood donors of Iran was reported by Sofian M et al6. A study at Naivasha, Kenya reported a higher prevalence (7%) 7.

To the best of our knowledge, there are only few publications projecting the baseline titre for brucellosis among blood donors and there are none from this part of the country

CONCLUSION: Any titre above the baseline titre can be taken as a diagnostic titre for the diagnosis of brucellosis. Based on our study results, the baseline titre of the agglutinins of B.melitensis and B.abortus is 1:40, and 1:20 respectively.

REFERENCES:
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