PREVALENCE OF SCRUB TYPHUS- AN EMERGING THREAT TO HUMAN HEALTH IN NORTHERN KERALA

DEEPA, C. K, PRIYA, M. N, NEERAJ, M, SUJITH, S,PRAVEEN, N,RAVINDRAN, R

Abstract: A survey was conducted to find out the incidence of scrub typhus among human beings of northern Kerala using the clinical records maintained at the medical ICU, Government Medical College, Calicut from January 2011 to January 2012. From 28 cases suspected for rickettsial disease, 10 were confirmed as scrub typhus and two as spotted fever based on the Weil Felix test. Females were found to be more prone to the infection. The important clinical signs noticed in almost all cases were fever, eschar, meningitis and atypical pneumonia. The study confirmed the presence of scrub typhus in the northern parts of Kerala.

Introduction: Scrub typhus is an acute, zoonotic, febrile rickettsial disease of humans caused by *Orientia tsutsugamushi*. The organism is transmitted only by the bite of mite larvae, known as "chiggers" of *Leptotrombidium (Trombicula) akamushi* and *Leptotrombidium deliense*. The infection is maintained in nature transovarially from one generation of mite to another. The nymphal and adult stages of the mite are free living in soil while the larvae or the chiggers that feed on the vertebrate host will act as the reservoir and vector for the disease [1]. In endemic areas a natural cycle of *O. tsutsugamushi* transmission occurs between mite and small mammals like field mice and rats. Repeated infection in the same individual and difficulty in vaccine design are due to several antigenic variants which are not cross protective. Scrub typhus has re-emerged as a major cause of fever of unknown origin in peninsular India in recent years. Endemic pockets in India include Tamil Nadu, Maharashtra, Punjab, Himachal Pradesh and Bihar [2]. Mortality rates approaching 30 per cent were reported. Even though spotted fever and scrub typhus causing heavy mortality were documented from Tamil Nadu in South India only scanty data are available from Kerala [3]. In association with scrub typhus in Kerala, atypical pneumonia [4] and meningoencephalitis [5] were reported separately**.** The present study was undertaken to identify the prevalence of scrub typhus in human cases presented in Government Medical College, Calicut with suggested signs of scrub typhus and the clinical manifestations.

Materials and Methods: Survey The survey was conducted for a period from January 2011 to January 2012 at Medical ICU, Government Medical College, Calicut and the data was collected from the case sheet maintained at the record library.

Selection of cases: Survey data sheet was prepared based on the clinical signs shown by the patients like fever, muscle pain, head ache, rashes, joint pain and diarrhea. The cases were also classified according to sex, age, results of Weil Felix test, treatment response and complications caused if any.

Results: The data regarding the history, clinical signs, diagnostic tests conducted, therapy and outcome of patients admitted in the Medical ICU of Calicut Medical College were studied during the period from January 2011 to January 2012. A total of 1185 cases with fever were presented in the ICU. Out of these, 28 cases were suspected for rickettsial disease which includes ten scrub typhus and two spotted fever cases based on Weil Felix test. Sixty two percent cases showed fever and associated symptoms while 14 per cent showed eschar and urine attributes. Meningitis, encephalitis and seizures were present in 17 percent cases whereas atypical pneumonia, dyspnea and hepatomegaly were present in 7 percent of cases. Females were more prone to this disease [64 per cent]. Mortality occurred in 7 per cent of cases.

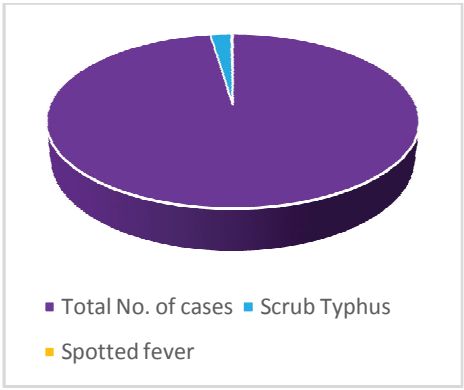

Fig 1: Percentage of rickettsial diseases among total number of fever cases presented at Medical ICU, Calicut.

Fig 1, represent the proportion of rickettsial diseases suspected from January 2011 to 2012 and it shows the percentage of scrub typhus and spotted fever in total number of cases screened.

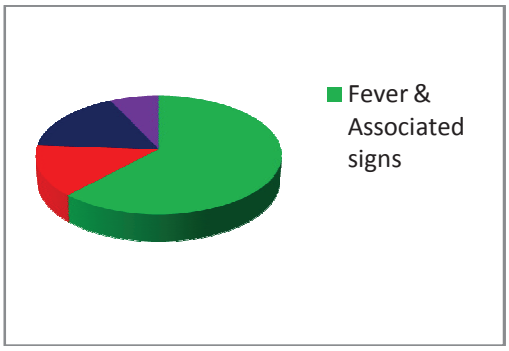

Fig 2: Percentage of cases showing different clinical signs

Clinical signs included fever, eschar and urine attribute, meningitis, seizures, atypical pneumonia, dyspnea and hepatomegaly.

Discussion: Rickettsial infections are widely distributed throughout the world and recent reports suggests to their continued presence in several parts of the Indian sub continent. The geographical condition is favorable for the development of vector for the disease in the state of Kerala. Storage of fodder for domestic animals may attract rodents thereby transmitting the infection to domestic animals [6] which can act as the reservoirs of infection [7]. In the present study females were found to be more liable to the disease, as they are more involved in the works like animal rearing, clearing of vegetation, cleaning of drainage and are highly prone to vector bite.

The incubation period of scrub typhus is about 10 to 12 days after the initial bite. The illness begins rather suddenly with shaking chills, fever and severe head ache, infection of the mucous membrane lining the eyes (the conjunctiva) and swelling of the lymph nodes (lymphadenopathy). A wound (lesion) is often seen at the site of the chigger bite. In the present study eschar was noticed only in 14% of the cases as bite wounds are common in whites than in Asians [8]. The clinical manifestations of the disease vary in severity from mild and self-limited to fatal and the case fatality rate can be as high as 30 % if untreated [1]. Scrub typhus can closely mimic multiple illnesses like enteric fever, dengue, leptospirosis and sometimes even leukemia [9]. Spotted fever was noticed in two cases which indicate the importance of involvement of domestic animals like dogs in the transmission of the disease as dog tick is the vector [10]. The geographical locations of scrub typhus, the initial sore caused by the chigger bite and the occurrence of specific proteins capable of destroying the organism [antibodies] in the blood, provide helpful clues and are useful in establishing the diagnosis.

From the study it is evident that there is presence of scrub typhus in the state of Kerala even though the reports are rare. Since the clinical signs were misleading, there are chances that it can lead to mortality. Exposure to environmental factors including bushes, piles of wood, domestic animals and rodents were significantly associated with illness [11]. From the study, it is evident that scrub typhus is prevalent in the northern districts of Kerala manifesting all clinical forms and may be a disease to fear with in the near future.

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Dept of Veterinary Parasitology,
e-mail: deepack@kvasu.ac.in,
Dept of Veterinary Parasitology,
e-mail: mnpriyar@yahoo.com,
Assistant Professor, Department of Pharmacology & Toxicology
,e-mail: sujith@kvasu.ac.in
Dept of Veterinary Parasitology,
e-mail: reghu@kvasu.ac.in
College of Veterinary & Animal Sciences, Pookode- 673576
Dept of Medicine,
e-mail: nmanikath@gmail.com;
Dept of Plastic Surgery, Government Medical College, Kozhikkode,
e-mail: deepamhouse@gmail.com