

Clinico-epidemiological and Genotyping Correlation of Pediatric Scrub typhus from Chandigarh, India



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Background

❖ Scrub typhus is a reemerging pediatric infection and is becoming prevalent in hitherto non-endemic regions.

❖ Strains of *Orientia tsutsugamushi* are classified into high virulence group (Karp, Kato and KN-3 genotypes), an intermediate virulence group (Gilliam genotype) and a low virulence group (Kuroki, Kawasaki and KN-2)

❖ In view of the varied clinical presentation with different strains, the knowledge of distribution of various genotypes in endemic areas is important.

❖ Pediatric literature is scant regarding clinical phenotype and genotype correlation of *O. tsutsugamushi*, which could be useful in the development of future diagnostics and vaccines.

Methods

❖ Eligible children: All febrile children 2 months - 14 years presenting to Pediatrics emergency services at our hospital

❖ Enrolment period: 2 time epochs- from June 2013 to December 2014 and June 2016 - December 2017 (three years).

❖ All children were screened for malaria, typhoid, dengue, leptospira, and scrub and other relevant tests wherever indicated.

❖ Positive scrub typhus by IgM ELISA assay (by InBios International Inc., USA) were identified (cutoff value- 0.468)

❖ Out of all scrub typhus ELISA positive cases, serum samples were randomly selected for indirect immunofluorescence assay (IFA) for *O. tsutsugamushi* (Fuller Laboratories, California, USA)

❖ IFA was done to confirm diagnosis as well as to determine the genotype of the *Orientia tsutsugamushi* prevalent in our region.

❖ The test kit simultaneously detected and semi quantitatively determined IgM antibodies against *O. tsutsugamushi* using four strains namely Bryong, Gilliam, Karp and Kato.

❖ The test samples were standardized for various dilutions ranging from 1:32 to 1:1024.

Results

❖ Out of 71 samples positive for scrub typhus ELISA, 15 samples were tested for IFA .

❖ Out of these maximum prevalence seen was of Karp genotype (8) [Fig.1] followed by Kato (3), Boryong (1) and Gilliam (1).

❖ Two patients were mixed genotype having both Karp and Kato (1) and Karp and Boryong (1). IgM titres in most of the cases were 1:128.

❖ Six of the 8 children with Karp genotype had multisystem involvement in the form of

❖ acute undifferentiated fever, encephalopathy, hepatitis, shock, serositis, sepsis and thrombocytopenia.

Conclusions/Learning points

Karp was the most prevalent prototype of *O. tsutsugamushi* isolated with severe systemic manifestations among scrub typhus IgM positive children.

Fig.1 Immunofluorescence assay of Scrub typhus IgM elisa positive child showing Karp genotype seen as immunofluorescent bodies; orange rods are the controls

