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

Nidhi Singla<sup>1</sup>, **Vidushi Mahajan<sup>2</sup>**, Jagdish Chander<sup>1</sup>, Vishal Guglani<sup>2</sup> ; Departments of <sup>1</sup>Microbiology and <sup>2</sup>Pediatrics, Government Medical College and Hospital, Chandigarh, India

#### 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 relavant tests whereever 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.

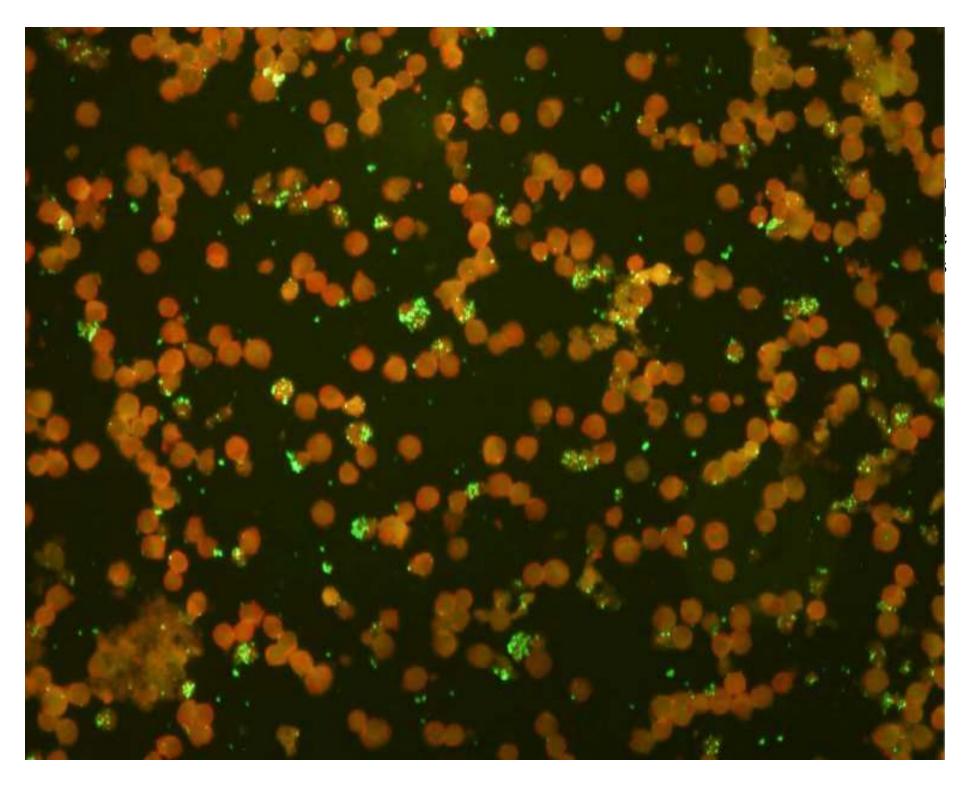
Out of these maximum prevalence seen was of Karp genotype (8) [Fig.1] followed by Kato (3), Boryong (1) and Gilliam (1).

✤ 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.

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





#### **Conclusions/Learning points**

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