

## CONCURRENT INFECTION OF DENGUE CHIKUNGUNYA AND SCRUB TYPHUS IN JHARKHAND, INDIA

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### ABSTRACT

It is very unlikely to have multiple concurrent infection such as malaria, dengue, chikungunya and other vector borne disease. Articles reporting concurrent infection of dengue chikungunya and scrub typhus are very few. Our series encompasses 5 proven case of dengue, chikungunya with scrub typhus admitted from November to December 2019 in department of paediatrics, RIMS, Ranchi. This is an observational study. The mean age of presentation is 11 yrs. Most common presenting complains were fever, headache, vomiting, pain abdomen, rashes. The mean duration of hospital stay was 7 days. Only one death was reported in our case series. Rest four cases were cured with no any patient suffered any sequelae. In case of concurrent infection of dengue, chikungunya and scrub typhus vigilant monitoring of vitals platelet transfusion and timely treatment with doxycycline are necessary. High degree of suspicion has to be made for coinfection in patient presenting with febrile illness with thrombocytopenia and deranged lab parameter in post monsoon season in endemic areas.

**KEYWORDS:** The mean age of presentation is 11 yrs.

### INTRODUCTION

The common cause of acute febrile illness caused by mosquito in our region are malaria, Dengue and chikungunya, Recently scrub typhus is also reported which is caused by mite bite. Malaria is caused by bite of anopheles mosquito.

#### Dengue

Dengue virus is a member of arbovirus family Flaviviridae and is related to Japanese encephalitis, yellow fever, west Nile fever.<sup>[2]</sup> Dengue infection is caused by four antigenically distinct dengue virus serotype (DENV1, DENV2, DENV3, DENV4).<sup>[1,2]</sup>

The global burden of disease has increased in the last three decades to at least 4 fold.<sup>[2]</sup> The infection is transmitted from person to person by aedes mosquito.<sup>[1,2]</sup>

Dengue severity exists as a continuous spectrum of disease through to severe dengue, previously known as DHF which is characterised by capillary leakage leading to hypovolemic shock, organ impairment, and bleeding complication.<sup>[1,2]</sup> careful clinical judgement is required throughout the patient stay in the hospital to maintain an

effective circulation while assiduously avoiding fluid overload.<sup>[2]</sup> Till date there is no any specific therapeutic drug available for the treatment of dengue also there is no dengue vaccine available for public health use at present.<sup>[2]</sup> Diagnosis can be established by serological testing for anti dengue IGM and IGG by Elisa.<sup>[2]</sup>

#### Chikungunya fever

Chikungunya fever is a member of arbovirus family.<sup>[1]</sup> Togaviridae genus alpha virus.<sup>[2]</sup> CHIKV was first isolated from patients in Tanzania in 1952 -1953. Its name in the local word meaning "that which contorts or bend up".<sup>[2]</sup>

The main vector for human transmission is aedes aegypti. Although a number of other species can transmit infection.<sup>[2]</sup> CHIKV fever has often been misdiagnosed as dengue fever due to its similarity of symptoms but in chikungunya there is incapacitating arthralgia which is the hallmark of the disease.<sup>[2]</sup> Arthralgia is bilateral symmetrical and affecting smaller joints such as ankle, toes, fingers, elbow, wrist and knee.<sup>[1]</sup> Although CHIKV fever is generally self limiting, chronic arthralgia also been reported to persist for several month and even years.<sup>[2]</sup> Studies have revealed that CHIKV virus could

be detected in the synovial macrophages of chronic patient and this has been postulated to mediate arthralgia also arthritic condition was associated with increased infiltration of monocytes and macrophages and natural killer cells as well as pro inflammatory mediators such as HCPI, TNF alpha and gamma.<sup>[2]</sup> It further supports that arthralgia associated with CHIKV is immune mediated. Diagnosis can be established by PCR. IGM can be detected by IFA.<sup>[1,2]</sup>

### Scrub typhus

Scrub typhus infection is caused by *Orientia Tsutsugamushi* and contracted by the bite of larval stage chigger.<sup>[1,2]</sup> It clinically present as fever, generalised or regional lymphadenopathy, macular or maculopapular rash, severe headache and myalgia.<sup>[1]</sup> Other manifestation includes nausea, vomiting, diarrhoea, constipation.<sup>[1]</sup> Immunity to scrub typhus following overt disease is remarkably short lived lasting only a few months and is highly strain specific so that heterologous protection is insufficient to protect from infection with different strain.<sup>[2]</sup>

The gold standard diagnostic test for scrub typhus are Immunofluorescent assay and indirect Immunoperoxidase test.<sup>[1,2]</sup> Scrub typhus can be prevented by wearing protective clothing, by treatment of clothing with repellents acaricides, application of DEET etc to exposed areas of skin, when walking terrain of endemic areas.<sup>[2]</sup> Doxycycline is the standard treatment with an effective dose for 5-7 Days.<sup>[1,2]</sup>

True burden of this disease are likely to be higher than reported and may vary by region. Scrub typhus is often underdiagnosed as its nonspecific clinical features including high fever lymphadenopathy, rashes, myalgia and headache which makes it difficult to differentiate from other febrile illness.<sup>[1,2]</sup>

## MATERIALS AND METHODS

All the patients were suspected to have dengue or chikungunya were also investigated for scrub typhus

**Table 1:**

Patient no.	Age (years)	Sex	Date of admission	Date of discharge	Duration of stay	Presenting complaint	outcome
1	14	F	6/11/19	16/11/19	10 days	Fever Headache pain abdomen Vomiting Altered sensorium Rash	Good
2	11	F	27/11/19	2/12/19	6 days	Fever Headache Pain abdomen Vomiting Rash	Good
3	6	M	27/11/19	2/12/19	6 days	Fever Myalgia Pain abdomen Rash headache	good
4	8	M	5/12/2019	10/12/2019	5days	Fever, rash headache, vomiting	good
5	16	F	12/12/2019	19/12/2019	7 days	Fever, rash, headache abnormal body movement Altered sensorium	death

after 7 days of fever not responding to conservative management for dengue or chikungunya. Those patients who have positive serology for dengue or chikungunya or Japanese encephalitis, along with scrub typhus included in the study. This study was done to know the clinical course, natural history, cross reactivity and immediate outcome due to above concurrent infection. These patients were admitted in Department of paediatrics, RIMS, Ranchi. These cases will then be followed up to 6 months for any residual sequelae. This is an observational study.

### Inclusion criteria

All patients who were clinically suspected and tested positive for dengue virus, chikungunya virus, Japanese encephalitis, along with scrub typhus were included in the study.

### Exclusion criteria

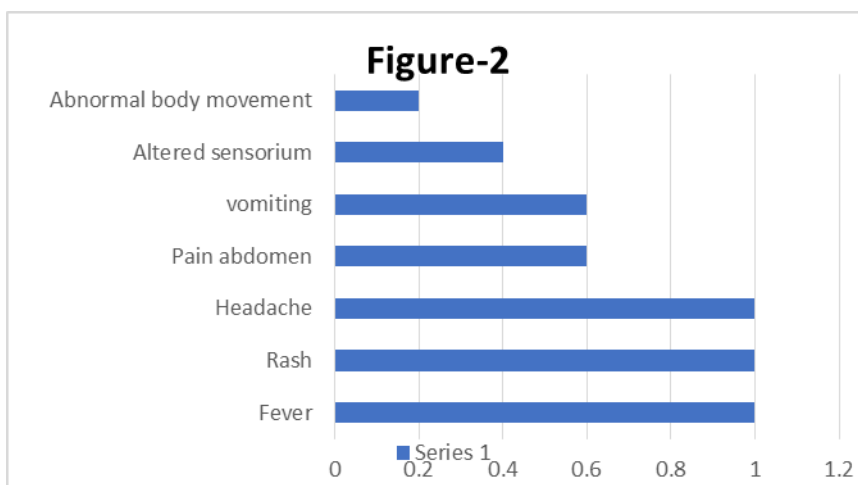
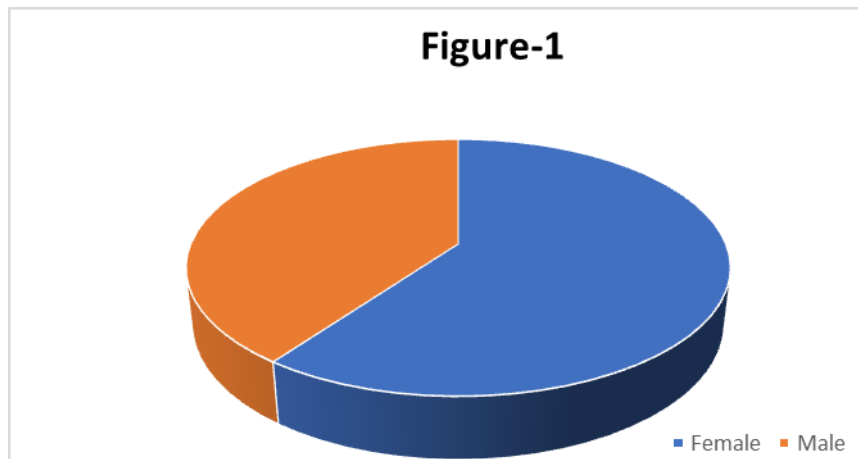
Patient who are immunocompromised, patient with severe acute malnutrition, patient with Tuberculosis and malignancy.

### Methods of collection of data

At admission parents/guardians were informed about the study and written informed consent were taken and detailed history was obtained with special focus on any domestic animals and proximity to paddy fields and frequent visits to forest. All the cases underwent necessary investigations:

CBC, PBS, blood smear for MP thick and thin, serology for dengue and chikungunya, serology for scrub typhus and Japanese encephalitis.

Clinical data related to all the cases along with detailed investigation reports, treatment given and there outcome were compiled and further follow up was conducted as per plan.



## RESULTS

Among all the 5 cases presented in the study period duration 3 (60%) were females and 2 (40%) were males. The mean age of cases was 11 yrs.

The patient presented with multiple complains and the most common complain were fever (100%), rash (100%), headache (100%), vomiting (60%), pain abdomen (60%), altered sensorium (40%) and abnormal body movement (20%). Other complains were loss of appetite (60%) and generalised weakness (80%). The mean duration of hospital stay was 7 days male 6 days female 8 days. Four out of 5 cases had no any poor outcome or any sequelae. One case resulted in death.

## CONCLUSION

An observation made by epidemiologist and entomologists that there is sudden rise in number of infective mosquito in post monsoon season which resulted in various arthropod borne infection in our region. The treatment of dengue and chikungunya is supportive care along with concurrent infection of scrub typhus were treated with Doxycycline. It has been observed in our series that multiple arthropod borne infection may coexist in single subject. But high degree of suspicion and a proper protocol is needed to identify and finally diagnose these cases.

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