

## Concurrent Infection with Dengue and Chikungunya in Malaria Patients

Dr. Nupur Kumari<sup>1</sup>, Dr.(prof.)Rajeeva Mishra<sup>2</sup>

<sup>1</sup>(Department Of Pediatrics And Neonatology, Rajendra Institute Of Medical Sciences/ Ranchi University, India)

<sup>2</sup>(Department Of Pediatrics And Neonatology, Rajendra Institute Of Medical Sciences/ Ranchi University, India)

Corresponding Author: Dr. Nupur Kumari

---

**Abstract:** Vector borne diseases like Dengue, malaria and chikungunya are endemic in India. Dual infections of chikungunya and dengue are becoming more common in India and there were earlier case reports of dengue, chikungunya and malaria co-infection .. This is a study describing presence of two viral infections along with vector borne parasitic infection in a single patient with overlapping clinical symptoms. The clinical features common to all the three diseases are prolonged fever, backache, joint pain, rash, headache, running nose and epistaxis causing challenge in diagnostic segregation based on the symptoms alone

This study is a cross sectional randomised sample study of 40 children with sudden onset of fever presented with or without rash, thrombocytopenia and splenomegaly. Data was collected in Months of 1st June to 30<sup>th</sup> October 2018 from RIMS, RANCHI, JHARKHAND. Hence forth the above study showed that Patient with triple infections and coinfections had better prognosis

---

Date of Submission: 02-04-2019

Date of acceptance: 17-04-2019

---

### I. Introduction

Vector borne diseases like Dengue, malaria and chikungunya are endemic in India. Dual infections of chikungunya and dengue are becoming more common in India (1,2), and there were earlier case reports of dengue, chikungunya and malaria co-infection (3) including in RIMS. In India, the first case of concurrent infections with dengue, chikungunya and malaria was published by Hati et al (4) in 2016. This is a study describing presence of two viral infections along with vector borne parasitic infection in a single patient with overlapping clinical symptoms. The clinical features common to all the three diseases are prolonged fever, backache, joint pain, rash, headache, running nose and epistaxis causing challenge in diagnostic segregation based on the symptoms alone. The current study aims to build growing awareness and education about the coinfections among physicians for further diagnosis and management.

### II. Material And Methods

This cross sectional randomised sample study was carried out on patients of Department of Paediatrics at Rajendra Institute Of Medical Sciences, Bariatu, Ranchi, Jharkhand From June 2018 To October 2018. A total 40 subjects (both male and females) of aged < 19, years were for in this study.

**Study Design:** cross sectional randomised sample study .

**Study Location:** This was a tertiary care teaching hospital based study done in Department of Paediatrics and Neonatology at Rajendra Institute Of Medical Sciences, Bariatu, Ranchi, Jharkhand

**Study Duration:** June 2018 To October 2018.

**Sample size:** 40 patients.

**Subjects & selection method:** The study population was drawn from all febrile patients who presented to OPD and Ward of Department of Paediatrics and Neonatology with fever >7 days and were positive for malaria (Pv, Pf or PanPf) not cured with antimalarial from June 2018 To October 2018.

Patients were divided into four groups as follows:

Group A- MALARIA MONOINFECTION

Group B - MALARIA, CHIKV AND DENV COINFECTION

Group C - MALARIA AND DENV COINFECTION

Group D - MALARIA AND CHIKV COINFECTION

**Inclusion criteria:**

1. All febrile patients [ >7days] positive for malaria (Pv,Pf or PanPf) coming in OPD and ward of RIMS ,ranchi , Jharkhand.

**Exclusion criteria:**

1. All febrile patients [ <7days] positive for malaria (Pv,Pf or PanPf) .

**Limitations:**

1. Small number of sample size.
2. Even smaller number of coinfectd samples.
3. Prevalence of coinfection might be different in larger sample size.

**Procedure methodology :**

- After written informed consent from parents was obtained, blood sample were sent to look for presence of malarial parasite then dengue(dengue IgM [NIV Pune kit]) and chikungunya (Chikungunya IgM [NIV Pune kit]) serology positive cases.

**Statistical analysis :**

Data were not statistically significant .

**III. Result**

Out of 40 malaria positive samples ,5 sample were positive for triple infection of MALARIA, CHIKV AND DENV. 3 samples were positive for coinfection of MALARIA AND DENV. None with MALARIA and CHIKV coinfection.

Clinical characteristics of patients with malaria monoinfections and coinfections were similar. only 1 of them presented with rash.

All other associations were not statistically significant.

**FIGURE - Characteristics of patients infected with chikungunya virus, dengue virus, or both, in malaria positive patients.**

TOTAL SAMPLE(40)	MALARIA MONOINFECTION	MALARIA, CHIKV AND DENV	MALARIA AND DENV	MALARIA and CHIKV
	32/40	5/40[12.5%]	3/40[7.5%]	0
SEX				
MALE	14	2/5	2/3	0
FEMALE	18	3/5	1/3	0
	AGE[Y]			
<5	15/32	3/5	1/3	0
5-10	11/32	1/5	2/3	0
10-15	3/32	0/5	0/3	0
15-19	3/32	1/5	0/3	0
	SIGN AND SYMPTOMS			
FEVER	32/32	5/5[100%]	3/3[100%]	
RASH	1/32	1/5	0/3	
THROMBOCYTOPENIA				
Mild	4	0	0	
Moderate	0	2	0	
Severe	0	3	3	
IMPAIRED CONSCIOUSNESS/COMA	8/32	3/5	0/3	
CONVULSIONS	8/32	1/5	0/3	
NAUSEA	12/32	3/5	1/3	
VOMITING	10/32	3/5	1/3	
HEADACHE	12/32	3/5	3/3	
JOINTPAIN	3/32	1/5	0/3	
DEATH	1/32	0/5	0/3	

#### IV. Discussion

The first case of coinfection with dengue and malaria by *P. falciparum* was published by Charrel et al(5) in 2005 and Hati et al(1) in 2012 .

Bhalla et al (6)reported first case of concurrent infection of dengue and malaria in India in 2005.

- Patient with triple infections and coinfections had better prognosis.
- Clinical characteristics of patients with malaria mono-infections and coinfections were similar.
- All had longer febrile period.
- Coinfections are associated with MODERATE to severe thrombocytopenia.
- only 1 of them presented with rash.
- All associations were not statistically significant .

#### Antibody mediated cross antigen reduction theory

- Usually in dengue infection ,we see that presence of Antibody against one strain cause enhancement of antigen of 2<sup>nd</sup> strain leading to more severe infection and death of patient . This is called Antibody mediated antigen enhancement phenomenon.
- In our study , patient suffering from 3 diseases simultaneously survive without any sequelae of adverse outcome . This observation prompted us to speculate whether a phenomenon **Antibody mediated cross antigen reduction taking place or not?**
- this observation need further research and peer review to finally quantify the phenomenon.

#### V. Conclusion

- Mosquito-borne infections are important public health concerns worldwide.
- Thus , there is a great need to increase the awareness and education about the coinfections among physicians for diagnosis and management .
- Failure to delay to recognize the concurrent infections can delay the initiation of proper therapy resulting in increased morbidity and mortality.
- Hence this study emphasizes the need for multidimensional diagnostic approach.

#### References

- [1]. Chahar HS, Bharaj P, Dar L, Guleria R, Kabra SK, Broor S. Co-infections with chikungunya virus and dengue virus in Delhi, India. *Emerg Infect Dis*. 2009;15:1077–80. 10.3201/eid1507.080638 [PMC free article] [PubMed] [Cross Ref]
- [2]. Kalawat U, Sharma KK, Reddy SG. Prevalence of dengue and chikungunya fever and their co-infection. *Indian J Pathol Microbiol*. 2011;54:844–6 . [PubMed]
- [3]. Thangaratham PS, Jeevan MK, Rajendran R, Samuel PP, Tyagi BK. Dual infection by dengue virus and *Plasmodium vivax* in Alappuzha district, Kerala, India. *Jpn J Infect Dis*. 2006;59:211–2 . [PubMed]
- [4]. Hati AK, Chandra G, Mukherjee H, Mondal R, Talukar, Bhattacharyya N. Concurrent infections of three mosquito borne diseases– Dengue, chikungunya and malaria. *J Mosq Res* 2016; 6: 1–3.
- [5]. charrel RN, Brouqui P, Foucault C, Lamballerie X de Concurrent dengue and malaria. *Emerg Infect Dis* 2005; 11 (7): 1153–4.
- [6]. Bhalla A, Sharma N, Sharma A, Suri V. Concurrent infection with dengue and malaria. *Indian J Med Sci* 2006; 60: 30–1

Dr. Nupur Kumari. “Concurrent Infection with Dengue and Chikungunya in Malaria Patients.”  
IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 18, no. 4, 2019, pp 01-03.