



## POST-PYRETIC ARTHRALGIA: CHIKUNGUNYA INDUCED RHEUMATOID ARTHRITIS

### Orthopaedics

**Dr Iqbal Singh Ghai**

Associate Professor, Department Of Orthopaedics, Govt. Medical College, Amritsar

**Dr Ajay Chhabra**

Professor And Head, Department Of Medicine, Govt. Medical College, Amritsar

**Dr Kiranpreet Kaur\***

Medical Officer, All India Pingalwara Charitable Society (regd), Amritsar  
\*Corresponding Author

### ABSTRACT

Chikungunya virus is a RNA virus of family Togaviridae and genus Aphavirus which is a single stranded one. It causes chikungunya fever, transmitted by *Aedes* mosquitoes. Chikungunya fever consists of acute illness stage during which the patients have high grade, chills, conjunctivitis, maculopapular rash, myalgias, polyarthralgias/polyarthritis, and headaches lasting from four days to six to eight weeks. After acute illness subsides, some patients develop seropositive rheumatoid arthritis which subsequently resolves with treatment. **Materials and methods-** The present study was done in department of Orthopaedics and department of Medicine, Govt. Medical College, Amritsar. The study consisted of a total of 65 cases. **Results-** Of the 65 cases of chikungunya; 26 patients(40%) were seropositive for rheumatoid arthritis. 61(93%) of all the chikungunya patients were treated with low dose(tapering)corticosteroids and had resolution of symptoms on four month follow up period ; in 4(7%) cases methotrexate was given along with tapering dose of corticosteroids. **Conclusion-** Low-grade rheumatoid arthritis activity got triggered following infection with chikungunya virus which got alleviated with low dose methylprednisilone and methotrexate.

### KEYWORDS

Rheumatoid arthritis, chikungunya, methylprednisilone, methotrexate

### INTRODUCTION

Chikungunya fever is caused by the chikungunya virus (CHIKV), an arbovirus transmitted by *Aedes* species mosquitoes. First isolated in 1952 in Tanzania, CHIKV has caused intermittent outbreaks in Africa, Asia, the Indian Ocean islands, and in southern Europe. In 2013, CHIKV spread to the Western Hemisphere. 46 countries and territories have documented local transmission with 1.7 million cases reported<sup>1</sup>. At the present time, it is estimated that 39% of the world's population lives in countries endemic for CHIKV and are at risk for infection<sup>2</sup>.

Chikungunya infection causes high grade fever, myalgias, nausea, headaches, polyarthralgia, and rash<sup>3</sup>. Chikungunya fever occurs in widespread epidemics and is defined by a history of acute febrile arthralgia (acute attack) with duration  $\geq$  48 hours and positive anti-CHIKV specific immunoglobulin M; or RNA virus by reverse transcriptase polymerase chain reaction; or post-exposure anti-CHIKV specific immunoglobulin G positive serologic test detected by ELISA<sup>4</sup>.

### Pathogenesis

Many viruses and their products, including Epstein-Barr virus, human immunodeficiency virus, alphaviruses, and flaviviruses, have been implicated in the pathogenesis of rheumatoid arthritis, possibly through molecular mimicry<sup>5,6</sup>. During infective stage, the formation of immune complexes may trigger the induction of rheumatoid factor, a high-affinity autoantibody against the Fc portion of immunoglobulin, which is implicated in rheumatoid arthritis pathogenesis<sup>7</sup>. In this hypothesis, viral antigens bear structural similarity to self-antigens. As a result, an immune response to pathogens could lead to cross reactivity with self-antigens.

Another mechanism by which viral infections could potentiate rheumatoid arthritis is through epitope spreading, in which the immune cell response extends beyond the original epitope, optimizing the protection against newly encountered pathogens and assisting in clearing inflammatory sites of damaged endogenous proteins of the body's own tissues<sup>8</sup>. Under abnormal circumstances, such as in rheumatoid arthritis, epitope spreading could lead to the development of an autoimmune response to the epitopes themselves.

### MATERIAL AND METHODS

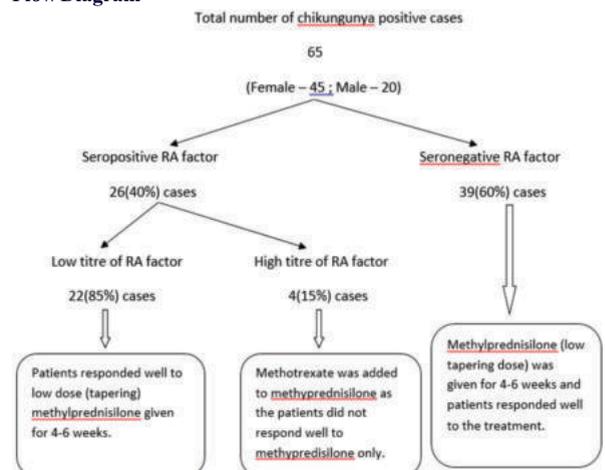
The present study was done in department of Orthopaedics and department of Medicine, Govt. Medical College, Amritsar; to find out the relationship between chikungunya and rheumatoid arthritis. The study consisted of a total of 65 cases who acquired chikungunya infection. An adult case of either sex of age 35 and above was included in the study. Of the total 65 cases; 45 were female and 20 were male.

26(40%) cases became seropositive for rheumatoid arthritis; out of these 26 cases 20 were females and 6 were male.

### RESULTS

- High grade fever, myalgia and arthralgia were seen in all 65 cases. Fever lasted for 2-5 days in all the cases.
- Small joints were involved in all 65 cases.
- Involvement of large joints was seen in 39(60%) cases.
- Joint stiffness was present in all the cases.
- Acute phase reactants were raised in all the cases.
- Positive anti-CHIKV specific immunoglobulin M and immunoglobulin G were seen in all the cases.
- 22(85%) cases had low positive RA factor and 4(15%) cases had high positive RA factor.
- Corticosteroids (methylprednisilone) were given in low doses(tapering) for four to six weeks in all 65 cases and 61(93%) cases responded to this treatment and in 4(7%) cases DMARDs (methotrexate) was given along with the steroids as they were not responding to corticosteroids only and it was observed that these 4 cases were having high titres of RA factor.

### Flow Diagram



### CONCLUSION

Ours is a small study which includes few cases of patients who became seropositive for rheumatoid arthritis after getting infected with chikungunya. Most of them responded to low dose steroids. Though the study has small number of patients yet it suggests the role of

chikungunya viral infection in rheumatoid arthritis initiation; implying the need for future evaluation for considering chikungunya virus as one of the predisposing factors for rheumatoid arthritis.

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