



Medical Microbiology

A CROSS-SECTIONAL STUDY ON THE PREVALENCE OF VIRAL ETIOLOGICAL AGENTS IN PATIENTS PRESENTING WITH ACUTE FEBRILE ILLNESS WITH SKIN RASHES AT A TERTIARY CARE CENTRE**Dr. Ashok Kumar Bindhu Archana***

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ABSTRACT

Viral exanthems are by far the most common cause of fever in India. A total of 100 patients of all age groups with provisional diagnosis of acute febrile illness with rash were evaluated during the period of November 2023-April 2025. This study was conducted at Sir Ronald Ross Institute of Tropical and Communicable Diseases, Hyderabad. IgM Enzyme Linked Immunosorbant Assay (ELISA) tests for Measles, Mumps, Varicella Zoster Virus (VZV), Epstein-Barr Virus (EBV), Herpes Simplex Virus-1 (HSV-1) and Parvovirus were performed on serum samples collected from patients with Acute febrile illness and rash. Febrile rash with seropositivity was more commonly seen in Varicella zoster virus (26%) followed by mumps virus (15%) infection followed by Measles (5%) and Herpes Simplex Virus-1 (4%) infection. Fever with maculopapular rash was the common finding seen in VZV (80%) positive. Among the 5 positive cases for measles, more seroprevalence were seen in 4 (80%) males when compared to females 1 (20%). HSV-1 seropositivity is lower in this location compared to baseline global seroprevalence and this study indicated a higher male inclination for herpes infection (75%), in contrast to the global female preponderance (25%). No participants were tested seropositive for Parvovirus and EBV.

KEYWORDS : Acute Febrile Illness, Rash, Viral Aetiology, Varicella Zoster Virus**INTRODUCTION**

Viral exanthems are by far the most common cause of fever. The severity might range from insignificant to potentially life-threatening. The viral infections which cause fever with rash are mainly Measles, Rubella, Varicella, Adenovirus, Herpes Simplex Virus-1 and 2, Human Herpes Virus-6 and 7, Epstein Barr Virus, Coxsackie, Dengue, Chikungunya, Influenza A&B viruses, Hepatitis B, Lassa, Marburg, Ebola, Hantavirus, Mumps and Parvovirus. Considering that a variety of viruses that can cause febrile rash illness (FRI) are similar in clinical manifestation, laboratory testing is a necessary measure to determine FRI pathogens, correct diagnosis, proper treatment, monitoring and initiation of preventive measures. Such detection can help to distinguish serious illnesses associated with substantial morbidity and mortality. This cross-sectional study aimed to determine the demographic details and clinical presentation of patients presenting with fever and rash and also to know the prevalence of viral etiology among patients by IgM ELISA.

MATERIALS AND METHODS

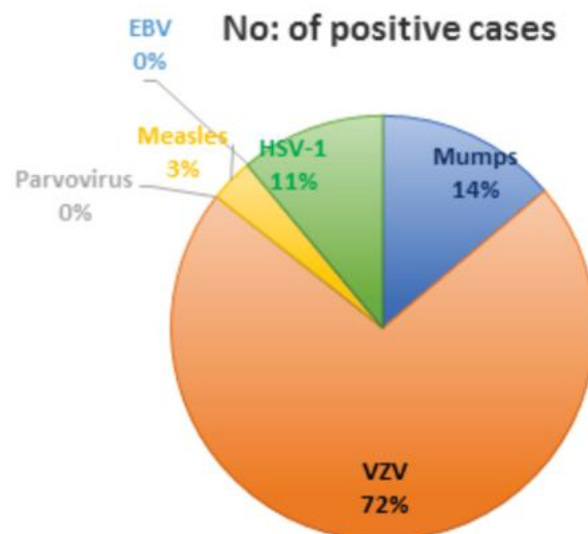
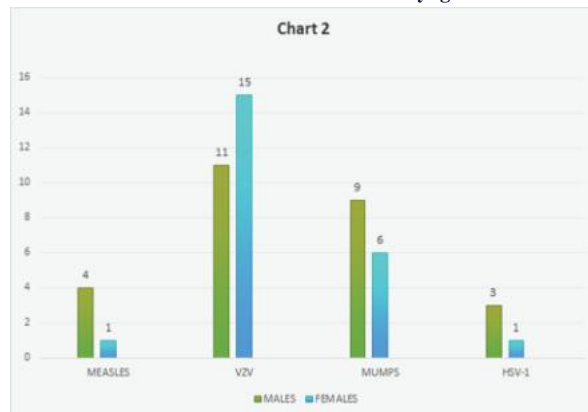
❖ **Study Setting:** The present Cross-sectional study was conducted at Sir Ronald Ross Institute of Tropical and Communicable diseases (SRRITCD), Govt. Fever Hospital and Viral Research and Diagnostic Laboratory, Osmania Medical College, Hyderabad, Telangana over a period of 18 months from November 2023 to April 2025.

❖ **Inclusion Criteria:** Patients of all age groups who presented with acute febrile illness and skin rash admitted to Sir Ronald Ross Institute of Tropical and Communicable diseases (SRRITCD) Govt. Fever Hospital. The serum samples were separated after centrifugation at 2000rpm for 10 minutes and stored in aliquots at -20°C temperature for serological analysis. Parvovirus IgM ELISA kit purchased from DIA. PRO Diagnostic Bioprobes Srl-Italy and other IgM ELISA kits from Calbiotech, Life Science company were used for the study. The tests were performed as per manufacturer's instructions and interpretation was done.

RESULTS

A total of 100 patients with provisional diagnosis of acute febrile illness were evaluated during the period of November 2023-April 2025 and were subjected to IgM ELISA. Overall, the mean age group included in the study was 29. The mean age among seropositive group was 27. The prevalence of each obtained were: 26 cases were found to be positive for Varicella Zoster virus, 15 for Mumps, 5 for Measles and 4 were HSV-1 positive. 58 males and 42 females participated in the study. Among 26 VZV positive cases, highest seroprevalence was seen in females 15 cases (57.7%) when compared to male population 11 (42.30%). A count of total 15 Mumps positive cases, the seroprevalence was seen highest in males 9 (60%) as compared to females 6 (40%) respectively. Four (80%) of the patients with positive

measles cases were male, one (20%) was female. Among 4 HSV-1 positive cases, the seroprevalence was more seen in females (3 cases 75%) when compared to male (1 case 25%) population. No positive cases of Epstein-Barr virus and Parvovirus were isolated from the samples collected.

**Chart 1: Number of Positive Cases Identified by IgM ELISA****Chart 2: Gender-wise Distribution of Positive Cases by IgM ELISA**

DISCUSSION

In our study, among 100 patients recruited, seropositivity was seen more with Varicella Zoster virus(26%) infection followed by mumps virus(15%). In the present study, overall seropositivity was more in males (27%) than females(23%).

In this present study, the gender -wise distribution showed females (31. 25%) were affected more than males (21%) due to varicella zoster virus infection. Study conducted by Josh Meyers et al in Epidemic Varicella Zoster Virus infection among University Students in India showed 79% males and 18.2% females were affected which was in contrast to the present study.¹ Since the chickenpox vaccine is not included by India's Universal Immunization Programme, outbreaks of the disease continue to affect the unvaccinated population.² Without vaccination, seroprevalence has been observed progressively increasing with age, reaching a peak in adults and teenagers.³ IgM ELISA results of present study detected (26%) positive VZV cases which correlates with that of a study done by Misra et al(31. 25%).²

In our present study, IgM ELISA showed 15 positive cases of Mumps infection. The present study showed most affected ones were above 15 years age group with male predominance. The peak of incidence in our study were reported in the month of January. IgM ELISA done by Williams et al(2017)study showed a result of seropositivity of 10.5% which was correlated to present study.⁴ A study conducted by Rahman A et al showed higher incidence of mumps infection in below 15 year age group with male predominance and the incidence varied with peak in January followed by December.⁵ Majority of the adults affected in the present study was unaware about their childhood immunization and their previous infection status.

The present study showed positive cases of 5 by IgM ELISA with male predominance(10%). Similar gender distribution was seen in studies done by Hashmi et al(2015)^{59. 2%} and Kirti et al(2023)^{25%.}^{6,7} The fact that half of the study participants were either unvaccinated or unaware of their vaccination status indicates that further efforts to enhance the immunization program are necessary.

The IgM ELISA positive rate of HSV-1 in present study was about 4%. In a study conducted by Deka S et al(2025), the seroprevalence of Herpes Simplex virus infections were found to be 6.2% which was correlating to the present study.⁸ In a study conducted by Memish et al(2015) and Sree Usha et al(2021) in all clinically suspected HSV cases, the IgM seroprevalence was found to be 88. 8% and 18. 2% which were in contrast with our findings.^{9,10}

In our study, there were no cases that tested positive for Parvovirus. Similarly a study conducted by Inci et al also showed no IgM seropositives for Parvovirus.¹¹ Our results deviated from those of Ankita et al(2020) and Mustafa et al (2024), who reported Parvovirus IgM seropositivity rates of 29.4% and 29. 2%, respectively.^{12,13}

No seropositive cases for EBV were reported in our study. A study done by Farber et al (2001) and Patel et al(2021) revealed IgM seropositivity for EBV of 94.4% and 56.1% respectively, which did not correlate with our findings.^{14,15}

CONCLUSION

This study highlights the importance of incorporating viral diagnostic testing, particularly IgM ELISA, in the evaluation of acute febrile illness to facilitate timely diagnosis, appropriate patient management, and effective public health surveillance. Varicella Zoster virus(26%) emerged as the most prevalent viral infection, followed by mumps (15%), measles(5%), and herpes simplex virus type 1(4%). The varicella vaccine is part of routine immunization programs in many countries but not in India, which contributes to low public awareness of the disease and its prevention. The most common reasons for transmission of these viruses include low vaccination coverage, incomplete vaccination, waning of immune status as in measles and mumps, overcrowding, and poor hygiene practices. This study highlights the need to evaluate the administration of booster doses of vaccine preventable diseases in adolescents and adults to enhance and sustain immunity. However, the study was limited by the inability to accurately document vaccination history for some participants because of recall bias, as well as by the relatively small study population. Therefore, larger-scale studies are warranted to strengthen the evidence and assess the impact of preventive interventions.

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Conflicts of Interest: None

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