

A Five Years Retrospective Trend of Rubella Virus Igm Antibodies from Measles Suspected Cases with Negative/ Intermediate Results for Measles Infection: from 2015-2019

Daniel Eshetu *

Department of Microbiology, Yirgalem Hospital Medical College, Yirgalem, Ethiopia

ABSTRACT

Background: Rubella is an important human pathogen that causes an acute and contagious infectious disease caused by a single-stranded RNA virus belonging to the family Togaviridae. As the clinical diagnosis of rubella is unreliable, serological tests are required for a diagnosis and the role of the laboratory is crucial in the management of rubella infection. Therefore, this study aimed to assess retrospective trends of rubella virus-specific IgM antibodies from measles suspected cases with negative/ intermediate results for measles infection.

Methods: A retrospective cross-sectional study was conducted on 1518 samples from 2015 to 2019 at Hadassah regional Public Health Laboratory, Southern Ethiopia. Measles suspected sample tested for IgM antibody and the results were negative/ intermediate for the measles virus, and those samples done for specific IgM antibody tests for Rubella virus were included in the study. Data on socio-demographic and clinical information of the patients' samples were retrieved from case-based reporting form, while results of Rubella specific IgM antibody tests were obtained from logbook of regional laboratory. Data entry and analysis was done by using SPSS version 20.

Conclusion: This study highlights the significant seroprevalence of rubella antibodies among measles suspected children. Providing and incorporating rubella-containing vaccines in the immunization program is vital for the eradication of the rubella virus infection. In addition, an organized surveillance study is required for the good estimations of rubella virus infection and its impact of congenital transmission.

Keywords: Measles suspected cases; Rubella virus; Southern-Ethiopia

BACKGROUND

Rubella is an important human pathogen that causes an acute and contagious infectious disease caused by a virus belonging to the Rubivirus genus in the family Togaviridae. It occurs worldwide in the non-vaccinated population with varying incidences of epidemics [1,2]. The virus is mainly transmitted from human to human by direct contact with infected bodily fluids or respiratory droplets from diseased people, usually characterized by a mild febrile rash illness [3]. Its incubation period ranging from 12 to 23 days, with an average of 14 days [4,5]. Rubella is a childhood disease usually having mild clinical appearances with maculopapular rash happening in 50-80% of rubella-infected persons [4,5]. In addition, rubella infection occurring just before conception and during the first trimester of

pregnancy may result in miscarriage, fetal death, premature delivery and a constellation of severe birth defects called Congenital

Rubella Syndrome (CRS), [4-7]. Currently, there is no specific treatment for the virus [8]. However, its burden can be minimized through use of the live attenuated rubella vaccine [9].

The World Health Organization (WHO) targets the elimination of rubella, as well as measles, which are vaccine-preventable diseases [10]. In African countries, including Ethiopia, data on rubella epidemiology is very limited. Moreover, in Ethiopia, the rubella investigation system has not yet been established. The seropositivity of rubella virus in measles suspected cases in Ethiopia is largely unknown. Therefore, this study aimed to assess the seropositivity of acute rubella infection among measles

Correspondence to: Daniel Eshetu, Department of Microbiology, Yirgalem Hospital Medical College, Yirgalem, Ethiopia; E-mail: danieshetu@gmail.com

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suspected case in Hadassah Regional laboratory, Southern Ethiopia

METHODS

A five-year retrospective data (2015-2019) of measles suspected cases with signs and symptoms of generalized rash and fever with a runny nose, cough, or swollen red weepy eyes (conjunctivitis) were included in the study and accessed from Hawassa regional Public Health Laboratory, Southern Ethiopia. The laboratory provides external quality assurance services for the entire region's hospitals and health center laboratories. Patients whose sera were negative/intermediate for measles IgM antibodies were re-tested for rubella specific IgM antibody. In addition, 2015 to 2019 data on socio-demographic and other relevant information of the patients were obtained from case-based reporting form and lab results were accessed from logbook of the Regional laboratory. Only data of laboratory-confirmed rubella cases were included in the study. The test was done by specific IgM antibody for rubella by indirect enzyme-linked immunosorbent assay method of commercially available standard kit (Siemens Diagnostics, Marburg, Germany).

Statistical analysis

Data entry and statistical analysis were done using statistical package for social science (SPSS) version 20. Descriptive statistics were used and data presented by frequency and percentage using tables and bar graphs.

RESULTS

Of 1518 measles suspected cases, 47.4% were females and males 52.6%, with male to female ratio 1.1:1. About 30.5% of suspected cases were aged between 2-5 years followed by 6-9 years old that was 24.8%. More than half (52.5%) of the suspected cases were vaccinated and 26.2% were not vaccinated for measles and others. Of the total 1518 measles negative and indeterminate cases, 246 (16.2%) were positive for Rubella virus-specific IgM.

Totally 51, 380, 396, 408 and 287 suspected cases were tested for rubella IgM antibody from 2015-2019, respectively. In addition, an increasing trend of rubella infection was observed from 2015-2019, that showed the year based prevalence of rubella infection was 0.7%, 0.7%, 3.7%, 3.0%, 4.2% and 4.7% from 2015- 2019, respectively (Figure 1).

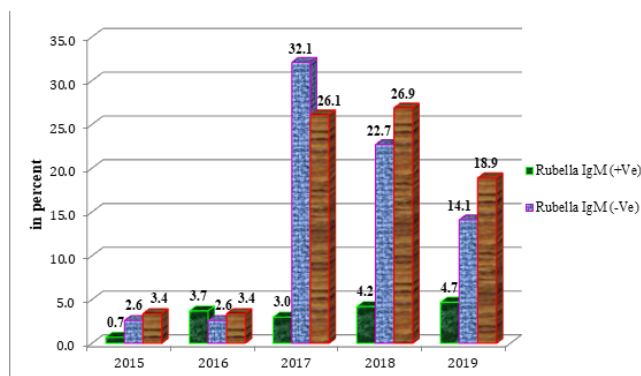


Figure 1: Trends of Rubella IgM results of 1518 measles suspected cases from 2015-2019.

DISCUSSION

The finding is comparable with the study conducted in Sudan that was 16.3%, a retrospective study reported by G, which were 15.3% and 17.3%, respectively. Conversely, a higher prevalence rate, 58.9% was reported from Adamawa State, Nigeria and democratic Republic of Congo that was 33 %.The variation might be attributed to the methodology of rubella diagnosis that means IgM antibody test was done in the current study whereas IgG antibody test was done in the Nigerian study. Furthermore, low rate of rubella virus.

CONCLUSION

This study highlights the significant seroprevalence of rubella antibodies among measles suspected children. Providing and incorporating rubella-containing vaccines in immunization program is vital for the eradication of the rubella virus infection. In addition, an organized surveillance study is required for the good estimations of rubella virus infection and its impact of congenital transmission.

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