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Microbiology

KEY WORDS:

PREVALENCE OF CYTOMEGALO VIRUS IN ANTENATAL AGE GROUP

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ABSTRACT

Cytomegalovirus is a common virus which can infect anyone and is found to be a leading cause of mental retardation in new-born infants. This article is focused on the prevalence of cytomegalovirus in antenatal women in tertiary care centres. A cross-sectional study was done to analyse the prevalence of cytomegalovirus infection during the antenatal period. The collected serum samples were processed using ELISA technique to detect IgM CMV antibodies.

AIM: The aim of this study is to assess prevalence of CMV infection in antenatal women.

INTRODUCTION:

Cytomegalovirus (CMV) is a genus of viruses in the order Herpesviruses, in the family Herpesviridae, in the subfamily Beta Herpesviridae. CMV is the most common congenital viral infection in humans. The virus was first discovered by Margaret G. Smith from the submaxillary gland of a dead infant. It was then named by Weller as CMV due to its cytopathic effects (1). Once infected, the body retains the virus for life. it rarely causes problems in healthy people and most people do not notice it.

CMV is a major cause of concern in pregnant women and people having weak immune system. A pregnant woman with an active CMV infection can pass the virus to her baby, who might then experience the signs and symptoms. All babies born to CMV-infected mothers do not develop congenital CMV, and not all of those that develop CMV will experience long-term effects.

1 in every 150 to 200 babies born in the USA is born with congenital CMV. However only 1 in 5 of these infants will experience any adverse symptoms or long-term issues. CMV is an important public health problem as it is a cause of serious morbidity and mortality in congenitally infected new-borns and immunocompromised patients.

This infection in India has not been thoroughly investigated and is a major health problem in need of some strong preventive measures. This article is focused on the prevalence of cytomegalovirus in antenatal women. (1).

STUDY DESIGN AND METHODS:

A cross sectional study was conducted in the department of microbiology of Saveetha Medical college and hospital, Chennai from 24th January, 2019 to 30th June 2019. A total of 83 samples were included in this study.

MATERIALS REQUIRED:

This study was conducted in the department of microbiology, **Saveetha medical college**, thandalam, Chennai -48. serum samples of antenatal age group and other age groups (paediatric) were collected and processed using ELISA technique for the detection of IgM CMV antibodies. The steps performed in ELISA is as follows:

Step 1 :100 microlitre of diluted samples /controls is placed in the wells of the strips, incubated for 45 minutes at 37 degree Celsius and washed 4 times.

Step 2 :100 microlitre of immunocomplex is added to each well, incubated for 45 minutes at 37 degree Celsius, and washed four times

Step 3 :100 microlitre of substrate is added to each well and incubated for 15 minutes at room temperature

Step 4 :100 microlitre of stop solution is added. absorbance is read at 450 nm within 30 minutes. samples diluted 1:101=10 microlitre of serum into 1 ml of diluent .100 microlitre of each diluted sample is dispensed per well. undiluted calibrators are placed in strip (100 microlitre in each well).one well is left for the blank, performed using 100 microlitre of the substrate mixture

RESULTS AND DISCUSSION:

The outcome of a cytomegalovirus infection is variable. It can be fatal or a lifelong companion. It has a worldwide distribution and is more prevalent in developing countries than in developed countries (1). In our survey there were 2 positive cases in the antenatal women and 14 positive cases in other age groups. But surveys in different parts of India show prevalence of cytomegalovirus IgG antibodies in about 80-90% of the antenatal cases (3). The outcome is worse when the infection sets in before 20 weeks of the gestation (4).

90% of the infected infants are asymptomatic during birth. Hearing loss, neurological deficits, chorioretinitis are seen in 5-17% of the infected infants in the 1st 2 years after birth. 90% of the infants develop anomalies and 20% die (5). Complications are seen in 90% of the surviving infants (6). The chances of recurrent congenital CMV infection to exhibit symptoms are less (7).

Thus, the primary infection of the mother during pregnancy plays a major role in transmission of CMV. **The infection can be diagnosed by the appearance of virus specific IgG in the serum of the pregnant women**. This is a reliable marker in detection of primary infection as it reveals various clinical condition along with the primary infection. Presence of viremia, antigenaemia,leuko-DNAemia,DNAemia or RNAemia and circulating cytomegalic endothelial cells (CEC) is indicative of primary infection.

Recently **Enzyme Linked Immunosorbent Assay (ELISA)** has been widely used for the detection of the antigen or antibody. 18.75% of the babies with congenital anomalies have been found to be positive for CMV IgM antibodies using ELISA although none of the mothers were positive for IgM antibodies (3). An avidity index above 65% during the 1st trimester of pregnancy is considered as a good indication of past CMV infection. (8). combination of IgG avidity assay with

I ELISA can be used for monitoring pregnant women for CMV infection (9).

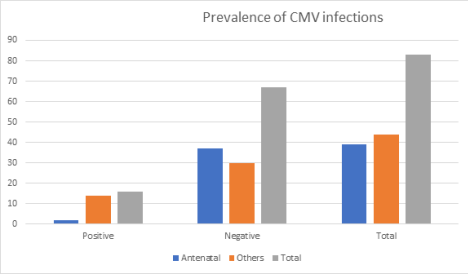
Recurrent infection can be diagnosed by virus isolation or antigen detection in samples other than blood. Saliva, vaginal secretions and urine can be used as samples and cmv can be isolated from them for a period of time.

IgM detection and PCR on urine are required to establish CMV infection in suspected individuals. (10). viral culture in the first 3 weeks of birth and CMV IgM detection is considered as the standard diagnostic test for CMV. PCR is superior to antigenemia assay and is essential for the detection of CMV in blood (11).

CMV infection can be detected at a very early stage using automated PCR when compared to conventional detection methods and automated PCR is more time saving than the antigenemia assay (12). Quantitative detection by duplex automated PCR system with an international reference standard has higher sensitivity than the COBAS Amplicon CMV Monitor test system (13).

PCR detection, pp65 determination, pp65 antigenemia are few tests which can be used for the monitoring of immunocompromised individuals and clinical cut off levels should be identified to predict the development of clinical symptoms (14).

	CMV IgM		Total
	Positive	negative	
Antenatal	2	37	39
Others	14	30	44



CONCLUSION

The prevalence of cytomegalovirus infection in antenatal women is relatively higher in developed countries than in developing countries. Screening for CMV infection in antenatal women must me made mandatory to prevent further rise in numbers. Further studies to investigate on the prevalence of CMV infection in antenatal women and other age groups must be encouraged.

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