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Foetomaternal Morbidity and Foetal Outcome of Cytomegalo Virus Seropositive Pregnant Women: Experience from Bangladesh

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Abstract: ***Introduction: One of the betaherpesvirinae subfamily of the herpes viruses is Cytomegalovirus (CMV). Most common cause of congenital infection is the CMV. On the other hand congenital CMV is most commonly identified as viral complication of mental retardation and one of the leading nongenetic causes of neurosensory hearing loss. Satistically in developed countries, congenital CMV infection occurs in 0.3% to 2.4% of all live births. One of the most dominant congenital viral infection is CMV and by this way , causes enormous disease burden on newborn infants. Seroprevalence in the mother antibodies to CMV due to the exposure of CMV before pregnancy, is now in a days the most important protective factor against congenital CMV disease. The aim of this study was to identify Foetomaternal Morbidity and Foetal Outcome of Cytomegalo virus Seropositive Pregnant Women. Objectives: This study was design to to detect foetomaternal morbidity of Cytomegalo virus seropositive pregnant women and to detect foetal outcome of Cytomegalo virus seropositive pregnant women. Materials and Methods: This cross sectional study was carried out in the Department of Microbiology, Armed Forces Institute of Pathology and Department of Medicine, CMH Dhaka from June 2016 to May 2017 and Study population were women of (21-50) years who were referred to Armed Forces Institute of Pathology for CMV test. Results: Among 567 pregnant women, age 21-50 yrs 33 cases found positive for IgM of cytomegalo virus , which is 6%. Among 33 IgM positive for CMV cases 30 children was born alive (91%), there were 3 miscarriages within 1st trimester of pregnancy which is 9% of all cases. Conclusion: CMV is an important cause of congenital infection and can result in significant perinatal morbidity and health care expense. Seroprevalence in the mother antibodies to CMV due to the exposure of CMV before pregnancy, is now in a days the most important protective factor against congenital CMV disease. Universal neonatal screening has been recommended to detect those at risk of congenital abnormalities.***

Keywords: Cytomegalovirus, Seroprevelance, Seropositive, Betaherpesvirinae, Neurosensory

1. Introduction

Cytomegalovirus (CMV) is a member of the betaherpesvirinae subfamily of herpes viruses. CMV is the most common cause of congenital infection.[1] On the other hand congenital CMV is most commonly identified as viral complication of mental retardation and one of the leading nongenetic causes of neurosensory hearing loss.[2,3] Satistically in developed countries, congenital CMV infection occurs in 0.3% to 2.4% of all live births..[4]

Most symptomatic neonatal CMV infections occur when a woman is newly infected just prior to or during pregnancy.[5,6] Maternal CMV infection in the period of pregnancy carries a 30% to 40% risk of vertical transmission. [5,6] Of all pregnancies with confirmed vertical transmission, only 10% to 20% of the fetuses will have evidence of clinical infection at birth.[2,3] As compared with women who are infected in the latter half of pregnancy, women who develop primary CMV infection in the first trimester are more likely to deliver fetuses with sensorineural hearing loss (24% vs 2.5%) or other CNS sequelae.[7] Mothers who are CMV seropositive prior to pregnancy can also develop a secondary CMV infection either due to reactivation of virus residing at specific sites in the body (primarily the salivary glands) or reinfection with a different viral strain.[6]

One of the most dominant congenital viral infection is CMV and by this way ,causes enormous disease burden on newborn infants Seroprevalence in the mother antibodies to CMV due to the exposure of CMV before pregnancy, is now in a days the most important protective factor against congenital CMV disease. The aim of this study was to identify Foetomaternal Morbidity and Foetal Outcome of Cytomegalo virus Seropositive Pregnant Women.

In this study, among 567 pregnant women (21-50 yrs) 33 cases found positive for IgM of cytomegalo virus which is 6% (table-1). Majority group belonged to 31-40 years (55%). So this group of pregnant women are mostly vulnerable.

In our study among 33 IgM positive for CMV cases 30 children was born alive (91%), 3 were miscarriage within 1st trimester of pregnancy which is 9% of all cases (table-3). Among 30 live births 21 child was born without complication. 09 babies were admitted in PICU, CMH Dhaka for several periods and later on diagnosed as failure to thrive and was on follow up which is 30% of positive cases for CMV (table-3). So we need to detect CMV positive cases earlier in pregnant mother. Universal neonatal screening has also been recommended to detect those at risk of congenital defects.

2. Materials and Methods

The study was a cross sectional study conducted in Armed Forces Institute of Pathology, Dhaka Cantonment and CMH, Dhaka. The study period was from June 2016 to May 2017.Study population were women of (21-50) years who

were referred to Armed Forces Institute of Pathology for CMV test and Sample size was 33.

Selection Criteria

Inclusion criteria

- Women of (21-50) years who were advised for CMV
- Pregnant woman
- Seropositive (IgM >15 U/ml)

Exclusion Criteria

- Unmarried patient were not included in the study
- IgM <15 U/ml

3. Results

Among 567 pregnant women, age 21-50 yrs 33 cases found positive for IgM of cytomegalo virus , which is 6%.

Table 1: Seroprevelance of Cytomegalo virus

Total Cases	CMV positive (IgM)	Percentage (%)
567	33	6%

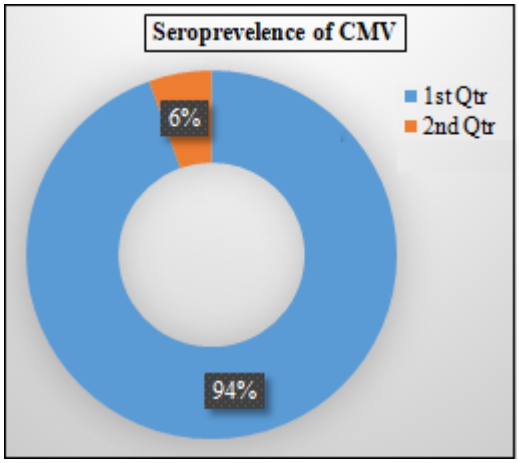


Chart 1: Seroprevelance of Cytomegalo virus

Table 2: Age distribution of study population

Age (years)	CMV positive (IgM)	Percentage (%)
21-30	10	30%
31-40	18	55%
41-50	05	15%

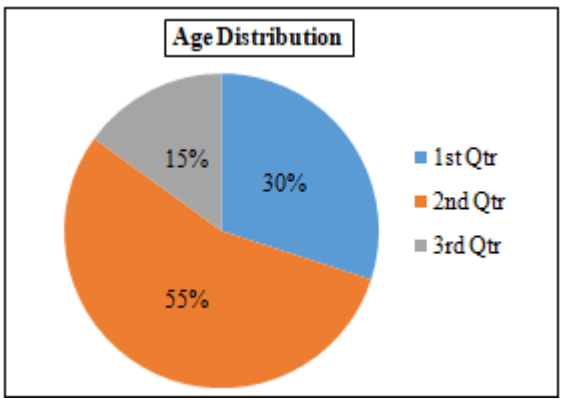


Chart 2: Age Distribution of study population

Table 3: Findings of Foetomaternal morbidity in study population

CMV (IgM)	Live birth	Foetomaternal morbidity
Positive 33	30 (91%)	03 (9%) (Miscarriage)

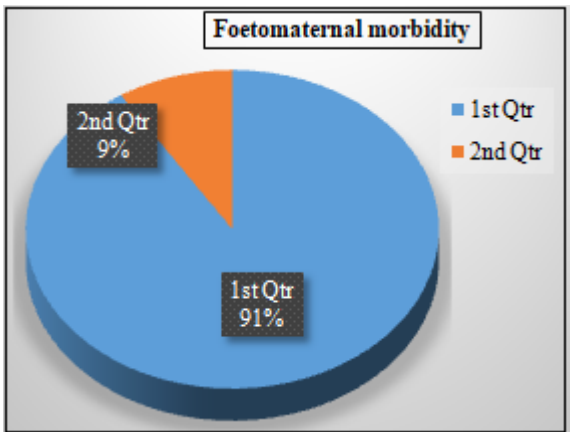


Chart 3: Findings of Foetomaternal morbidity in study population

Table 4: Findings of Foetal outcome in study population

IgM positive	Healthy child	Failure to thrive
30	21(70%)	09(30%)

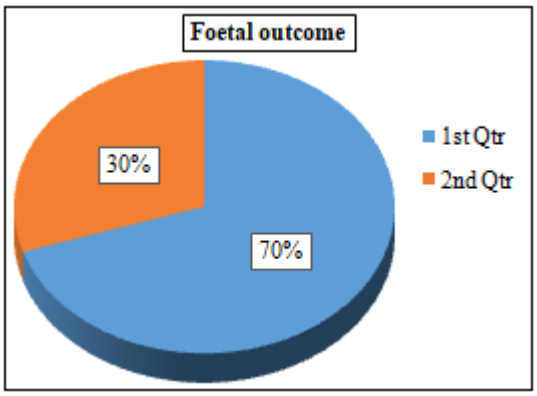


Chart 4: Findings of Foetal outcome in study population

Table 5: Congenital CMV syndrome in study population

Neonatal CMV syndrome	Number
Small for date	-
Failure to thrive	**09**
Microcephaly	-
Sensory neural deafness	-
Cerebral calcifications	-
Hepatospenomegaly	-
Chorioretinitis	-
Total	**09**

4. Discussion

CMV is an important cause of congenital infection and can result in significant perinatal morbidity and health care expense. Most common cause of congenital infection is CMV.[1] On the other hand congenital CMV is most commonly identified as viral complication of mental retardation and one of the leading nongenetic causes of neurosensory hearing loss[2,3] Satistically in developed countries, congenital CMV infection occurs in 0.3% to 2.4% of all live births[4] Infection can be acquired by close contact (via contaminated blood, urine, and secretions), vertically

through transplacental transmission, and postnatally through breast milkin the newborn.[1]

Most symptomatic neonatal CMV infections occur when a woman is newly infected just prior to or during pregnancy.[5,6] Maternal CMV infection in the period of pregnancy carries a 30% to 40% risk of vertical transmission. [5,6]

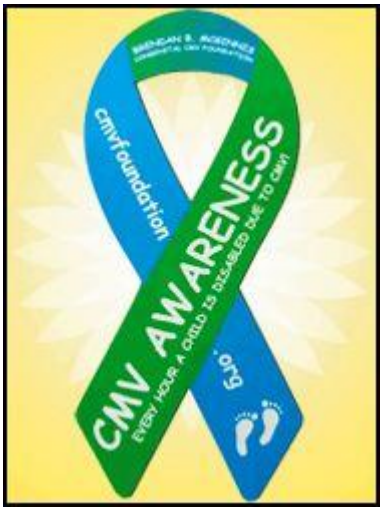
In this study, among 567 pregnant women (age 21-50 yrs) 33 cases were found positive for IgM of cytomegalo virus which is 6% (table-1). Out of 33 cases in this study, 10 cases (30%) belonged to the age group 21-30 years followed by 18 (55%) cases in the age group 31-40 years, 05 (15%) cases in the age group 41-50 years (table-2). Majority group belonged to 31-40 years (55%). So this group of pregnant women are mostly vulnerable.

In our study among 33 IgM positive for CMV cases 30 child was born alive, there were 3 miscarriage within 1st trimester of pregnancy which is 9% of all cases (table-3). Among 30 live births 21 child was born without complication. 09 babies were admitted in PICU, CMH Dhaka for several periods and later on diagnosed as failure to thrive and was on follow up which is 30% of positive cases for CMV (table-3). So we need to detect CMV positive cases earlier in pregnant mother. Universal neonatal screening has also been recommended to detect those at risk of congenital defects.

In the study of "Systematic review of the birth prevalence of congenital cytomegalovirus infection in developing countries" **by Tatiana M. Lanzieri, Sheila C. Dollard, Stephanie R. Bialek,and Scott D. Grosse**published on 12th March 2014 in Journal of clinical virology found seroprevelance of CMV in pregnant women ranges from 0.6 to 6.1% in developing countries, this study corresponds to this data. The Fetomaternal morbidity of CMV positive women ranges from 35% to 75% in different countries and prevalence of abnormal foetal outcome ranges from 28% to 66% in different populations according to above mentioned study which corresponds to our data.

Cytomegalovirus (CMV) of mother usually asymptomatic and patients are frequently diagnosed by clinical symptoms alone. Most of the infections, there is evidence of maternal seroconversion that is sufficient to confirm the diagnosis of a primary infection.

Perinatal ultrasound can aid in identifying structural or growth abnormalities that may suggest symptomatic fetal infection. Amniocentesis can be performed to confirm fetal infection, and is usually recommended in the situations where maternal primary or undefined CMV infection is detected in the very first half of pregnancy or in cases where sonographicfetal abnormalities are suggestive of infection. Immediately after birth, newborn CMV infection should be confirmed by isolating the virus in the urine and/or saliva in the first 2 to 3 weeks of life.The vaccine of CMV is currently unavailable and the treatment options in pregnancy are very limited. Suspected pregnant women caring for the children are at high risk for primary infection. Education regarding CMV and the hygienic measures has the potential to halt the primary maternal infection.



Limitation of Study

- It was not possible to observe the progression of CMV positive foetal outcome due to limited study period.
- As samples were randomly selected so it was difficult to get patient.

5. Recommendations

- For women planning to become pregnant, routine CMV screening can help them to understand how careful they must be to prevent infection.
- The limited success of vaccine prevention of CMV, attention has been directed at patient education as a means of preventing the acquisition of infection.
- Universal neonatal screening has been recommended to detect those at risk of congenital defects.

6. Conclusion

CMV is an important cause of congenital infection and can result in significant perinatal morbidity and health care expense. Seroprevalence of mother antibodies of CMV due to the CMV exposure before to pregnancy is currently the most important protective factor against congenital CMV disease. Universal neonatal screening has been recommended to detect those at risk of congenital abnormalities.

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