

A STUDY OF FOETAL WASTAGE AND CONGENITAL MALFORMATIONS IN RELATION TO CYTOMEGALOVIRUS

by

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Introduction

There is considerable paucity of data on congenital defects and foetal wastage due to cytomegalovirus infection during gestation in comparison to infection due to other viruses such as Rubella etc. This study was undertaken to investigate the prevalence of cytomegalovirus infection in the local child bearing female population and then to evaluate the foetal damage produced by this virus. Congenital infections with cytomegalovirus may result in foetal death or may produce the clinical syndrome of cytomegalovirus inclusion disease with signs of prematurity, jaundice with hepatosplenomegaly, thrombocytopenic purpura and disorders with evidence of damage to central nervous system (Monif, 1972; Hanshaw, 1973).

Material and Methods

Three hundred patients were admitted to this study. All the patients were taken from the out patient clinic and indoor wards of the Queen Mary's Hospital,

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Accepted for publication on 24-2-83.

K.G.'s Medical College, Lucknow, from the period of June 1978 to May 1979. Demographic data was collected as regards the parity and bad obstetric history.

Six to eight ml. blood of these patients was collected and serum was separated and stored at -20°C for the test. Complement fixing antibodies against cytomegalovirus were tested by modified micro-technique of Lennette and Schmidt (1964).

Observation and Results

Two hundred and fourteen cases showed positive evidence of complement fixing antibodies against cytomegalovirus (71.33%). Out of 284 women, 95 had history of foetal wastage in previous pregnancies. Out of these 77 (81.05%) were found to be positive for antibodies against cytomegalovirus (CF Antibodies). This finding shows high incidence in comparison to 56% positivity of CF antibodies in non-pregnant control without bad obstetric history. Total number of foetal wastage in the present pregnancy is 86 and 63 (73.23%) of these showed positive evidence of CF antibodies.

This shows distribution of cases studied.

This shows the incidence of positive CF antibodies in cases delivering still born foetuses (92.30%) and in cases delivering

TABLE I
Distribution of Cases Studied

Type of patients	No. of cases	No. of CMV +ve cases	% of CMV +ve cases
1. <i>Abortion:</i>	100		
a. Threatened abortions	45	31	68.87
b. Inevitable incomplete abortion	55	36	65.45
2. <i>Antenatal Cases:</i>	92		
a. Previous bad obstetric history	60	42	70.00
b. Intra uterine growth retardation	16	13	81.25
c. Normal pregnancy	16	11	68.75
3. <i>Post Natal Cases (Mothers)</i>			
a. Cases delivering congenitally malformed babies	16	13	81.25
b. Cases delivering still born babies	13	12	92.30
c. Cases delivering premature babies	13	11	84.61
4. <i>Babies:</i>			
a. Congenitally malformed	12	5	41.67
b. Still borns	2	2	100.00
c. Babies with clinical evidence of cytomegalovirus infection	2	2	100.00
5. <i>Controls (non-Pregnant cases)</i>	50	35	70.00

TABLE II
Positivity Incidence of CMV Antibodies in Different Types of Foetal Wastage

Type of foetal wastage	Total No. of cases	No. of CMV +ve cases	% of CMV +ve cases
— Inevitable/incomplete abortions	55	36	65.45
— Threatened abortion who ultimately aborted	5	4	90.00
— Cases delivering still births	13	12	92.30
— Cases delivering congenitally malformed dead babies	8	6	75.00
— Cases delivering premature babies dying in Neo-natal period	5	5	100.00
Total	86	63	73.26

premature babies dying in neonatal period (100%).

Twelve babies with congenital malformations were also taken into study. Five of

these showed presence of CF antibodies (41.67%). Mother of all these babies also showed positive evidence for CF antibodies.

TABLE III
Incidence of CMV Antibodies in Sera of Babies With Different Types of Congenital Malformations

Type of Congenital Malformation	No. of cases	No. of CMV +ve cases
Hepatosplenomegaly with other congenital malformations	3	2
Anencephaly with meningo-encephalocele	2	1
Hydrocephalus with spinabifida with meningocele	2	1
No formation of vertebral column, occiput united with sacrum with exomphalos minor	1	—
Micro-ophthalmia with micro-cornea—with low set ears with CTEV	1	—
Dextrocardia	1	—
Cleft lip and cleft palate	1	—
Osteogenesis imperfecta	1	1

One neonate presented with malformations and developed persistent jaundice on the second day of life. Clinical examination revealed hepato-splenomegaly, micro-ophthalmia, microcephaly, congenital cataract in the right eye with bilateral congenital talipes equino varus and pilonidal sinus. Samples of blood taken on 2nd and 10th day showed positive titre of CF antibodies in 1/16 and 1/32 dilutions. Serum of the mother was also positive for CF antibodies.

Two other twin babies showed similar problem with positive serology in mother.

Urine examination for cytomegalovirus inclusion bodies by exfoliative cytology was also positive in all the 3 cases.

Discussion

The overall incidence of positivity of cytomegalovirus antibodies in the local female population in this study is 71.33%. Pal *et al* (1972) showed 100% positivity from Chandigarh and Madhavan and Prakash (1974) showed positive evidence for CF antibodies in 96.70% cases from Pondicherry. Stern and Elect (1965) from London showed 54% positivity and Krech *et al* (1970) showed 100% positivity in

developing countries. The study of cases of foetal wastage showed that the positivity incidence for CF antibodies is significantly high (73.26%) in these cases as compared to non-pregnant control cases (56%). The study of babies with congenital malformations shows positive incidence for CF antibodies in 41.67% cases. They also had hepatosplenomegaly, defects of central nervous system, eye and musculo-skeletal system. Similar findings have been highlighted by Monif (1969), Medearis (1964) and Pal (1972).

Both still-born babies without any evidence of external congenital malformations also showed 100% positivity for CF-antibodies. Lelong *et al* (1960), Quan and Strauss (1962). Naeye (1967) has also observed similar association in relation to still born foetuses.

The study of neonate with multiple congenital malformations is a strong suspicion of cytomegalovirus infection. Rising titres of CF antibodies were noticed from the blood samples and presence of cytomegalovirus inclusion bodies were seen in the urine confirming strong association of

cytomegalovirus infection with foetal wastage and congenital malformations.

Summary

Cytomegalovirus infection is very common in developing countries and positive evidence of complement fixing antibodies has been found to be 71.33% in this study. This has also been highlighted by Pal *et al* from Chandigarh and Madhavan from Pondicherry.

The high incidence of positivity of CF antibodies in the sera of still born foetuses (100%) and in their mother (92.30%) points out that every case of unexplained still birth should be screened for cytomegalovirus infection and treated.

Presence of CF antibodies in congenitally malformed children and evidence of inclusion bodies in the urine confirms the possible association of this infection with foetal wastage and congenital malformations.

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