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TEACHING FILES (GRAND ROUNDS)

A 3 MONTHS OLD WITH PNEUMONIA AND POSITIVE CYTOMEGALOVIRUS IGM

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KEYWORDS
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Clinical Problem:
Problem - A 3 ½ month-old female infant on exclusive breast feeds presented with constipation for 4 days. She had pneumonia 15 days ago which was treated with IV Ceftriaxone and IV amikacin for 7 days at another hospital. The attending physician in that hospital did a TORCH titres in the child and Rubella IgG was positive (11.7 AU/ml), Cytomegalovirus (CMV) IgG was positive (77.3 AU/ml) and CMV IgM was also positive (0.98 AU/ml). Mother's TORCH titres were done in the first trimester of the pregnancy in view of bad obstetric history and Mother's Rubella IgG (393.42 AU/ml) was positive at that time. Other TORCH IgG and TORCH IgM in the mother were negative at that time. The infant was born of a non-consanguineous marriage at 9 months of gestation by normal vaginal delivery and had a birthweight of 2.5 kg. There were 2 fetal deaths in the mother prior to this pregnancy and the first fetal death occurred at 9 months of gestation and the second occurred at 3 months of gestation, the causes of which were unknown. At presentation, the weight of the infant was 5.7kg (25th-50th centile as per World Health Organisation (WHO) charts), total body length was 60 cms (50th-75th centile as per WHO growth charts) and head circumference was 39cms (25th-50th centile as per WHO growth charts), general examination was normal and there was hepatosplenomegaly. Other systems were normal. On investigation, hemoglobin was 11.5gmdl, white cell count was 7800 cells/cumm (56% polymorphs, 40% lymphocytes) and platelet count was 4,15,000 cells/cumm. Serum aspartate transaminase (AST) was 35 IU/L and alanine transaminase (ALT) was 28 IU/L. CMV viral load in plasma was undetectable. CMV IgG avidity in the child was low (40.8%) and CMV IgG was 303 Au/ml. Hearing evaluation and ophthalmological examination of the child were normal. CMV titres done currently in the mother showed that CMV avidity was high (90.9%) and CMV IgG was 1087.7 Au/ml. CMV IgM in the mother was negative. The child is on regular follow up.

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Is this congenital CMV or acquired CMV?

Discussion:
CMV is a leading cause of serious viral intrauterine infections.[1] It can be acquired during pregnancy (congenital CMV infection), during delivery from maternal genital secretions or after birth (postnatal CMV infection).[2] Congenital CMV infection occurs as a vertical transmission from mothers. Diagnosis of congenital CMV (cCMV) in neonates necessitates the direct detection of virus in a saliva or urine sample obtained before 3 weeks of age, which is best accomplished through polymerase chain reaction (PCR).[1] When cCMV is suspected, testing should be done as soon as possible after birth. Antibody testing is not otherwise useful for cCMV diagnosis; CMV IgG does not distinguish between maternal and infant infection, and CMV IgM is not sensitive or specific for congenital infection.[1] Positive IgM antibody for CMV is linked to a more symptomatic illness; however it is not a reliable laboratory indicator of disease severity.[3] Hence this baby's positive IgM titres for CMV are not diagnostic of a congenital infection nor can one state whether it is an acquired infection as they have been done at 3 months of age. On the other hand postnatally acquired CMV is frequently caused by virus exposure through breast milk.[2] It has been found that in pre-term infants, if breastfed by CMV seropositive mothers (as in this patient), then the chances of acquiring CMV postnatally were about 16.5%.[4] To confirm the chances of postnatally acquired CMV in this patient an anti-CMV IgG infant–mother ratio can be done. A low value would suggest an acquired etiology. This ratio is affected by gestational age and is described for preterm babies. Because our patient was a full-term baby, this test would prove to be inefficient.[5] CMV IgG avidity is a sensitive and specific method for identifying pregnant women who have recently had primary CMV infection and are thus at higher risk of vertical CMV transmission. Low CMV IgG avidity accurately predicts primary infection in the previous 3 to 4 months, whereas high avidity excludes primary infection in the previous 3 months (as in our patient).[6] In our patient, hearing and ophthalmological evaluation in the child is normal and there are no other clinical features to suggest a congenital infection though the mother had 2 fetal deaths prior to this live birth. It has been shown that following an acquired infection,

the likelihood of fetal infection, as well as the risk of associated fetal death and other sequelae, increases.[7] Thus it is most likely an acquired CMV infection as the CMV IgG avidity in the baby was low with both CMV IgM and IgG positive. Also the mother had high CMV IgG avidity test suggestive of past infection and not current CMV infection so unlikely to be transmission through breast milk. Since mother's CMV IgM was negative, it is unlikely to be a reactivation of past CMV infection in the mother. Though hepatosplenomegaly can be due to congenital CMV, the liver functions in the child were normal and the enlargement of liver and spleen could be due to previous infection in the child in form of pneumonia. Also, the child does not have any hearing, ophthalmological, hematological on screening. The infant is on regular follow up.

Compliance with Ethical Standards

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Conflict of Interest: None

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