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CONGENITAL CYTOMEGALOVIRUS INFECTION AND ITS EFFECTS ON FETUS: A CASE REPORT

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ABSTRACT

Cytomegalovirus infection during pregnancy is very common. Vertical transmission is possible in all three trimester of pregnancy. 1 in 150 children are born with congenital Cytomegalovirus infection. It is the most common infective cause of mental handicap in newborn, Congenital Cytomegalovirus infection can cause sensorineural deafness, developmental delay and even fetal death. We present a case of Isolated bilateral ventriculomegaly at 33 weeks 4 days diagnosed as congenital Cytomegalovirus infection. Careful maternal and fetal monitoring and timely intervention leads to good fetal outcome.

KEYWORDS: Cytomegalovirus, Bilateral Ventriculomegaly, FISH, Amniocentesis

INTRODUCTION

Cytomegalovirus, a double stranded DNA virus belonging to family Herpesviridae. It is one of the commonest congenital viral infection present in live birth with prevalence of 0.5-2%. (1) It can be encountered in every 4th woman in child bearing age. (2) Maternal infection is usually asymptomatic and mother is normally not aware of being infected with CMV. After the primary infection virus becomes latent but whenever immunity drops, virus become reactived. Shedding of virus can occur from different sites and for longer duration of time. It is transmitted by blood, bodily fluids and also by vertical transmission in antenatal, intrapartum and during breastfeeding period.

It is not teratogenic, but it can cause immune mediated damage. (3) The risk of vertical transmission is 30-50% during primary infection. Of those infected, 90% of fetuses are usually asymptomatic at birth, while 10% may manifest signs or symptoms related to CMV infection. (4) It is the leading cause of deafness in children, In fetus major target organs in CMV are CNS, respiratory system, bone marrow, renal system, pancreas, and liver. Pregnant women are more severely infected by CMV in 1st trimester than 3rd trimester.

CASE REPORT

A 26 years old, primigravida at 33 weeks 4 days period of gestation was referred to us with ultrasound diagnosed bilateral ventriculomegaly in fetus. Patient gave no history of recent flu-like symptoms or fever with rash since first trimester. No aneuploidy screening was done. Her level II scan was normal at 19 weeks 2 days period of gestation. Her BMI was 25.7 kg/m^2. Repeat scan was done at our centre at 33 weeks 4 days and showed that the BPD was 81.5 mm, HC was < 5th centile, AC was 284.6mm, femur length was 61.2mm and the EFW was 1924gms. Fetal growth was on 15th centile for Gestational age. Bilateral ventriculomegaly measuring ventricular diameter 11.7 mm and 9.5 mm repectively was found and no other structural defects or markers for chromosomal abnormality was seen. Amniotic fluid volume and fetal dopplers were normal. Various possibilities such as aneuploidy, structural abnormality, viral infection or genetic syndrome were discussed with the patient and her husband. Viral serology results showed positive cytomegalovirus IgG and IgM antibodies with low IgG avidity. Amniocentesis was done, amniotic fluid was found positive for cytomegalovirus and fluorescence in situ hybridization was normal. Patient party was counselled regarding confirmed congenital cytomegalovirus infection and its consequences, perinatal prognosis was explained. A repeat Ultrasound was done after 2 weeks which showed, ventriculomegaly had increased and fetal growth was on 4th centile for gestation and umblical artery PI was > 95th centile. As there is worsening of ventriculomegaly and due to fetal growth restriction, we informed and counselled patient party

regarding current status of pregnancy and fetal prognosis. After taking the consent, steroid was given for the lung maturity and labor was induced at 35 weeks 4 days but patient was delivered by LSCS in view of failed induction of labor. Healthy baby was delivered with birth weight 2190 grams with APGAR score of 8/10 at 1 min and 9/10 at 5 min with no short term neurological sequelae. The baby is under follow up for next one year to assess any developmental delay or any late neurological sequelae.

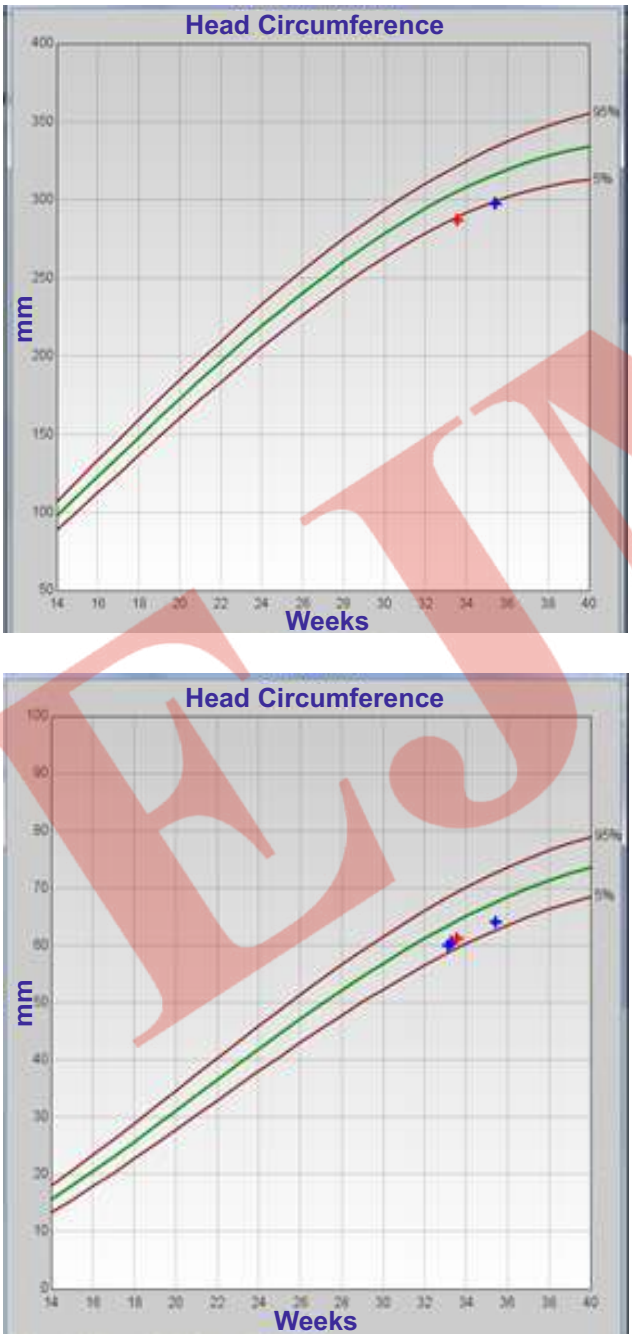
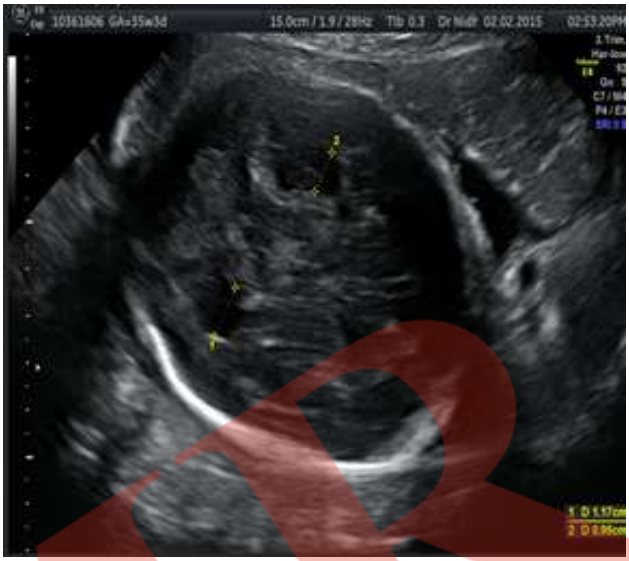
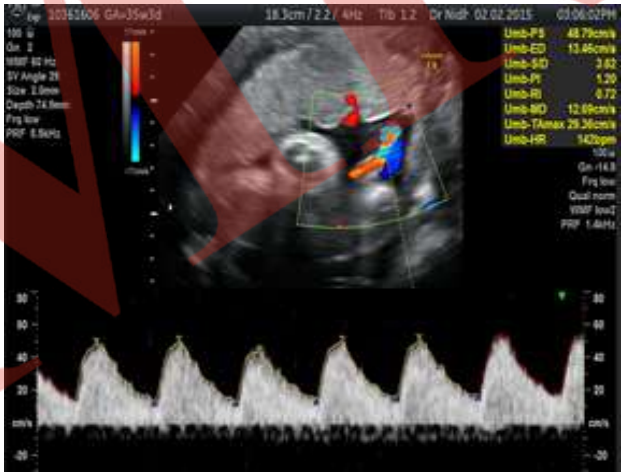


Fig. 1: Showing Serial Growth of The Fetus



A. Bilateral Ventriculomegaly



B. Umbilical artery Doppler

Fig. 2: Ultrasound Features of The Fetus at 35+3 Weeks POG

DISCUSSION

In normal pregnancies, neuronal cells migrate from the periventricular zone towards the cortical plate between 12th and 24th weeks of embryonic life thus allowing the formation of the brain fissure. (5) Cytomegalovirus Infection during early pregnancy leads to extensive damage of the brain whereas in later pregnancy, white matter abnormalities are more common when the gross development of the central nervous system is completed and the process of myelination of neurons is on going (6). CMV, one of the most common infective cause of early brain abnormality and its affinity towards neuronal cells can be detected by detailed USG examination and it can be ventriculomegaly, intraventricular haemorrhage, periventricular echogenicities, etc. Isolated bilateral ventriculomegaly can be associated with chromosomal

defects (5%), viral infections, rare genetic syndromes or bleeding disorders. Detection of ultrasound features of cytomegalovirus is difficult during initial weeks of infection because ultrasound features may not be evident during early infection which makes diagnosis difficult. Ventriculomegaly is common neurological finding that can be detected in routine anomaly scan. The progression of ventricular dilatation and the presence of other brain abnormalities are the main factors determining the prognosis of a fetus with an antenatal diagnosis of ventriculomegaly, which is better delineated on fetal MRI. Although ultrasound has a low sensitivity in detecting congenital CMV infection but the presence of ultrasound signs is an independent poor prognostic factor. Confirmation of fetal cytomegalovirus infection is done by amniocentesis. Congenital Cytomegalovirus infection can be prevented by counselling women about the source of infection and by taking hygienic precautions. Important source of infection during pregnancy are intimate contacts and young children. Body fluids sheds CMV for months to more than a year in adults. It can continue for years in young children if, during the first year of life child is exposed to infection. Preventing the maternal infection is the main stay of treatments as, there is no definitive role of antiviral therapy in pregnancy and there is no vaccine available till date. According to CDC, measures for prevention of maternal CMV infection includes :

- Washing hands regularly with soap and water, especially after feeding child, wiping child's nose, handling children's toys and after changing diapers.
- Never share used utensils, drinks or food with young children.
- Avoid putting child's pacifier in your mouth.
- Never share a toothbrush with a young child.
- When kissing a child, avoid contact with saliva.
- Clean all the countertops, toys and other surfaces that come into contact with children's saliva or urine. (7)

There are various case reports showing different clinical presentations of congenital CMV infection in neonates, which are diagnosed as congenital CMV retrospectively. A case report published in journal of pediatric Dermatology reported a case of a congenital CMV infection with Blueberry muffin skin lesions and hepatosplenomegaly, diagnosed as congenital CMV infection retrospectively.

A case report by K. Wilson et al published in journal of Case Reports in Pediatrics volume 2020, reported a case of a term neonate with trisomy 21 with hyperbilirubinemia and splenomegaly, was later diagnosed as congenital CMV infection.

CONCLUSION

As per ACOG, routine serological screening for CMV is not recommended. However, counselling of the patients at risk can be used as a method of prevention in CMV infection. This case shows different challenges associated with late diagnosis of congenital CMV infection in pregnant women as well as management with good outcome. The focus of this publication is to increase the awareness among general obstetrician regarding CMV infection, its complications and prevention, Also to increase public awareness.

Ethical Clearance: Patient identifiers have been anonymised.

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