CASE STUDY

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Lissencephaly with CMV Infection: A Case Study

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ABSTRACT

A nine months old baby boy was admitted in a pediatric ward at SGG Hospital, Vadodara diagnosed with lissencephaly associated with Cytomegalo virus (CMV) infection. Lissencephaly includes severe brain deformations. Cytomegaly infection is popularly known as a pathogen for this anomaly. He had both Computer Tomography scan and Magnetic Resonance Imaging tests. A social smile was absent and he was previously diagnosed with Global Developmental Delay (GDD) and a deformed head. Congenital Cytomegalo infection (CMV) is a vertically transmitted disease in newborn infants which causes multiorgan affection. But the most severe and permanent damages are those affecting the central nervous system (CNS) such as mental retardation, sensorineural hearing loss, chorioretinitis, cerebral palsy, and seizures as a result of the virus with neurogenesis.

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INTRODUCTION

In general there are 8 Human herpes viruses in which the Human Cytomegalovirus is also one. Brain damage and intrauterine infections are the leading causes of Cytomegalovirus infections, especially in children [1]. CMV is the main cause for multi-organ affection with the most serious and rare sequelae of CNS. This infection can be symptomatic and asymptomatic which cause a variety of neurological damages [2, 3].

Prenatal and postnatal ultrasound and magnetic resonance imaging i.e., neuroimaging contribute to the detection of Central Nervous system structural development in CMV infection. Congenital CMV infection can cause disturbances in the neurogenesis of the CNS. Hearing impairment is the common cause in infected infants (symptomatic and asymptomatic) and ranks with CMV. Visual defects are also included as common sequelae [2].

Lissencephaly includes several ranges of brain deformations. It is caused by genetic and non-genetic factors. Every case has some unique symptoms which mainly include seizures, feeding difficulty, breathing problems [4, 5].

CASE PRESENTATION

A 9-months-old boy of non-consanguineous parents was brought to pediatric OPD with the chief complaints of delayed development and deformed head which is depicted in Figure 2. He had no complaints of refusal to feed, cough, or cold, and also had no complaints of convulsions. The mother had an uninterested antenatal period. The baby was born by normal vaginal delivery with a birth weight of 2.3 kg. The baby immediately cried after the delivery and there is no history of PICU/NICU stay. The baby was immunized to date. He developed repeated convulsions for one month of his age and was not growing properly accordingly. He had the average quantity of hemoglobin in red blood cells (RBC), which is known

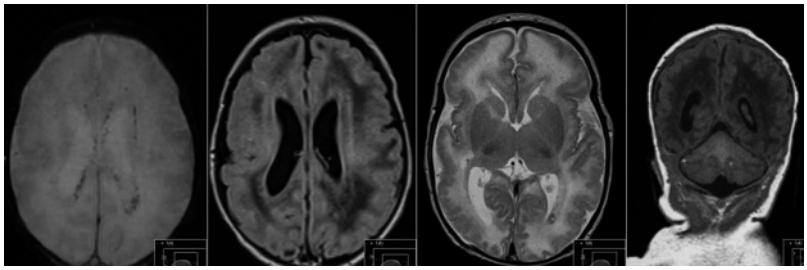

Figure 1: The Gradient Echo Image has seen with many bilateral ventricular black small dots that represent multiple small calcifications

Figure 2: Nine-year-old Patient with deformed head and Global Developmental Delay

as Mean Corpuscular hemoglobin (MCH). Had tactile stimulation. Microcephaly was noted at birth, CT scan, and USG Brain was advised. Parents reported complaints of mildly dilated lateral ventricles with marginal calcifaction difference in the visualization of the vermis. There was no history of fever, rash, vomiting, head injury, unconsciousness, feeding difficulties, or any seizure disorder in his family.

In white matter in Figure 1, FLAIR shows extensive diffuse signal abnormalities. Periventricular distribution of calcifications is characteristic for Congenital Cytomegalovirus infection (CMV).

MRI confirmation is needed. On clinical examination, the baby had increased muscle tone in bilateral lower limbs and microcephaly. He was brought to SSG Hospital, 3 months later for microcephaly & hearing loss. He was advised to take TORCH titer- CMV IgM+IgG which both are reactive. Brainstem Evoked Response Audiometry (BERA) and the objected test were performed to understand the transmission of electrical waves to click sounds. There was a severe hearing loss of the right ear within normal limits sensitivity.

MRI reports concluded Type-2 Lissencephaly, Corpus callosum +ve, decrease in volume of the pons, and bilateral middle cerebellar peduncles. Mild smooth pachymeningeal enhancement bilateral frontal lobes. Curvilinear foci of intracranial calcifications and multiple punctuate linear was very evident. MRI was revealed ventriculomegaly involving all four ventricles, CT Scan of the brain showed moderate ventriculomegaly, periventricular calcification, and lissencephaly depicted in Figure 1. USG Brain report was her both bilateral ventricles appear dilated and cerebral sulci are poorly described, calcifications are seen around the lateral ventricles which are moderately and symmetrically bit dilated, and an impression is noted as cytomegalovirus infection.

Ophthalmic examination reports were pending. Urinary CMV PCR was positive. History of fever and rashes were seen in the antenatal period. He was also seen with Koch's contact, DM, HTN, asthma, neonatal jaundice. The Baby's diet was exclusively on breastfeeding. No pallor, cyanosis, edema, icterus, tachypnoea, distress was observed. Per abdomen was soft and normal. The cardio Vascular system was also normal with no murmur. In the

Respiratory system, both lungs were clear. Raised hemoglobin levels, increased RBC's and Packed Cell Volume (PCV) were seen in hemogram reports. Red Cell Death. The width was longer than usual. The leucocyte count was higher than the normal count.

The test was performed on Abacus Diatron Cell Counter. Improper collection and delay in transportation of samples affect the accuracy of test results and shall be interpreted with a clinical condition. Biochemistry tests concluded higher raise in Serum Alkaline Phosphatase (ALP). He was on Inj.Gancyclovir100mg/kg/day. 50mg IV BD in 1ooml NS (10am-10pm).

On day-2 one episode of convulsions was tested for 30-40sec associated with clonic tonic movement. No up rolling of eyeballs, no foam from the mouth, and no involuntary micturition and defecation were seen. The general condition was normal. Phenobarbitones were given as a treatment with a dose of 100mg/dl. On Day-3, no active ocular complaint was noted. A patient refused visual assessment. Lens was clear. Squirt examination cannot be done as the patient is sleeping.

For this sickness, he was treated with oral phenobarbitone inadequate dose without significant improvement. Motor system examination revealed hypertonia and prolonged deep reflexes in both upper and lower limbs. The assessment of development showed his social smile was absent, hearing is impaired, neck holding control, but he can fix gaze and follow an object. Eventually, the case was diagnosed as cytomegalovirus infection with Lissencephaly with convulsions. This patient was treated with various antiepileptic drugs to control seizures and ultimately discharged by proper counseling.

DISCUSSION

Congenital CMV infection is the most commonly spread viral infection in the world. More or less 7% to 10% of neonates with CMV infection can have symptoms like microcephaly, hepatosplenomegaly, hearing loss, and intracranial calcifications. Other symptoms include hepatitis, pale, less birth weight, neurologic and hematological abnormalities [6–8]. White matter abnormalities are very common in patients with CMV infections. A wide variety of migrational abnormalities have been seen in patients with CMV infection. In CT scans, intracranial calcifications can be defined. Calcification can usually be chunky and very thick in texture periventricular in the ependymal and subependymal region [7, 9]. However, calcification in CMV infection patients is extremely common. Cranial ultrasonography, magnetic resonance imaging, and computed tomography have been used for diagnosing congenital CMV infection [10–12].

CONCLUSION

There is no proper cure or treatment for this CMV infection. Treating with Drug Ganciclovir can help in recovering the hearing loss. The presence of some characteristic findings like intracranial calcification, ventriculomegaly, migrational abnormalities, and periventricular cysts may help diagnose CMV infection in infants and neonates with neurodevelopmental disorders.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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