

EP07.43 Key Neurological Findings in Congenital Infections: A Comparison of CMV, Toxoplasmosis, and Zika



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**Objectives:** Among the major vertically transmitted infections, toxoplasmosis, cytomegalovirus (CMV), and Zika virus (ZIKV) stand out due to their high teratogenic potential. The similarity in clinical manifestations makes it challenging to identify the causative agent based solely on clinical assessment. This study aims to compare neuroimaging findings in eight confirmed cases of intrauterine infection: four cases of toxoplasmosis, two of CMV, and two of ZIKV.

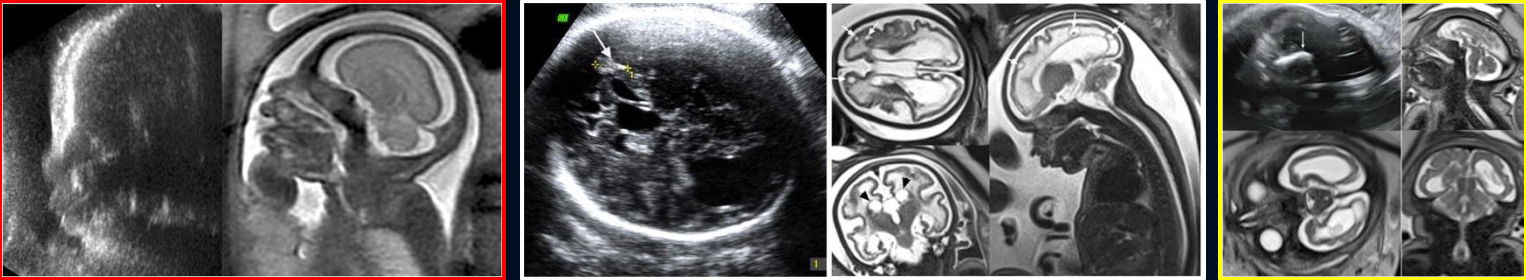
**Methods:** Eight cases of congenital infection were systematically monitored throughout pregnancy. All fetuses underwent periodic evaluations using obstetric ultrasound (US) and fetal magnetic resonance imaging (MRI) to detect abnormalities in the central nervous system and other affected organs. After birth, additional neuroimaging was performed using computed tomography (CT) and/or MRI to further characterize the previously identified anomalies. All images were analyzed by an expert radiologist, focusing on the distinctive findings of each infection.

**Results:** Neuroimaging findings were interpreted based on radiological characteristics, including brain calcifications (periventricular and cortical in CMV; nodular cortical in toxoplasmosis; subcortical in ZIKV), ventriculomegaly, brain atrophy, and neuronal migration disorders (common in CMV and ZIKV, rare in toxoplasmosis) (Table 1).

**Conclusion:** Neuroimaging plays a crucial role in the differential diagnosis of congenital infections caused by toxoplasmosis, CMV, and ZIKV. Although not pathognomonic, findings such as the distribution of calcifications, ventriculomegaly patterns, and cortical malformations aid in identifying the causative agent. The integration of US and MRI with clinical and laboratory data is essential for prognosis and management, highlighting the importance of a multidisciplinary approach.

|               | Brain Calcifications                                  | Microcephaly                                                      | Neuronal Migration Disorder | Ventricular Enlargement | Cerebellum                                                   |
|---------------|-------------------------------------------------------|-------------------------------------------------------------------|-----------------------------|-------------------------|--------------------------------------------------------------|
| CMV           | Periventricular and cortical, punctate or plaque-like | Yes                                                               | Yes                         | *                       | May have hypoplasia/degeneration areas                       |
| Toxoplasmosis | Nodular cortical                                      | Rare                                                              | No                          | ***                     | May have hypoplasia/degeneration areas                       |
| Zika Virus    | Subcortical                                           | Yes, with occipital prominence and excessive occipital skin folds | Yes                         | *                       | Mostly preserved, but may have hypoplasia/degeneration areas |

Table 1: Key Neurological Findings in CMV, Toxoplasmosis and Zika



**Microcephaly in CMV (US and MRI).** Toxoplasmosis: US and MRI (T2) demonstrate multiple annular lesions of varying sizes, with heterogeneous signal, predominantly hyperintense (arrows). Note diffusely distributed edema throughout the parenchyma, supratentorial ventricular dilatation and bilateral periventricular pseudocysts (black arrowheads). US shows calcifications (arrow). **Microcephaly and calcifications in Zika (US and MRI) / (34 weeks)**