Prenatal diagnosis and postnatal outcome of intracranial vascular malformations

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Objectives: intracranial vascular malformations (VM) such as is Circle of Willis malformation (CWM) & intracranial aneurysms are common fetal abnormalities. The etiology of VM is very heterogeneous, and outcome is rather different. Aim: to study prenatal diagnostic with volume ultrasound and magnetic resonance imaging (MRI) & outcome of intracranial vascular malformations in affected infants.

Methods: All fetuses diagnosed with VM in three centers, during a 15-year 2003-2018. Was used MR imaging & volume sonography as an aid in prenatal counseling since 2003. Results of prenatal testing were correlated with findings at postnatal clinical examination, investigation of neurological status, imaging, and pathologic analysis. CNS structures & vessels were well visualized as early as 21 weeks gestation, as were most other normal anatomic structures.

Results: was found 175 cases of VM (9 - were lost& excluded ). At last- group(1) – IA- 22 cases of aneurysm of Galen vein(AGV) & 1arterio-venous malformation of vertebral-basilar region (operated, developmental delay):associated anomalies(AA) - in 8 cases:1-transposition of great vessels(TGV), aplasia of corpus callosum , 1-ventriculomegaly, polymicrogyria, ventricular septal defect (VSD), intrauterine growth restriction (IUGR), preterm labor (both-died ), tetrad of Fallot (TOF)&hydrsops (died in 30weeks in utero), 4 cases (Down, Patau, lysencephalia , left heart hypoplasia , 1-ventriculomegaly, polymicrogyria, ventricular septal defect (VSD), preterm labor (both-died ), tetrad of Fallot (TOF)&hydrsops (died in 30weeks in utero), 4 cases (Down, Patau, lysencephalia , left heart hypoplasia , tetrada of Fallot (TOF)&hydrsps - terminated by parents conclusion(T). In 13 cases of isolated AGV- operated, normal outcome(NO) in 9 cases, serious developmental delay-2 cases, died after operation-2. Group(2) – 143 CWM-isolated was 129, NO- 119, 2- intraventricular hemorrhage (1 died in term labor, 1- NO, in 9 cases – AA (cardiac 6 (3-VSD; 1 TOF, 1 TGA, 1- aortal coarctation& VSD- all operated, NO), 1- Dandy- Walker&hydrsps- T.

Conclusions: fetuses with VM have increasing risk of brain malformation& poor outcome. Investigation of the intracranial vascular structures in 2-3 trimesters like part of the routine screening may be recommended.