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Foetal Dysfunction of the Arterial Duct: Clinical Spectrum and Outcome

Eyskens B., De Catte L., Heying R., Cools B., Brown S., Louw J., Gewillig M.
Fetal & Pediatric Cardiology, Neonatology, Leuven, Belgium

Background: Prenatal ductal complete closure is a recognised entity causing pathology at different levels of the right heart and pulmonary vasculature. Outcome of milder dysfunction needs to be defined.

Methods: retrospective study; foetal (1008) and neonatal (5400) echo databases searched for evidence of prenatal ductal dysfunction (1998-2011). Inclusion criteria: prenatal closure – constriction - aneurysm of arterial duct, postnatal (<7d) excessive RV hypertrophy, cyanosis by atrial R<L and/or obvious ductal pathology..

Results: 31 patients: 13 prenatally (GA29w,21-38w), incidence 1.3% abnormal scans), 18 postnatally (D0-6).
Foetal ductal abnormalities: complete closure (n=9), constriction (n=3) or aneurysmatic dilatation (n=1). 3 Mothers had taken NSAID. Clinical presentation at birth was cyanosis (sat. < 85%) (74%), severe pulmonary hypertension (38%), heart murmer (6%); 20% were asymptomatic . On echocardiography patients had excessive RVH (28), a bipartite RV (4), RV aneurysm (1), significant TR (17), chordal rupture with functional PA (2), hydrops (1), PS (6) and PR (4) ranging from mild to « agenesis » of pulmonary valve (3), dilation of pulmonary trunk and branch pulmonary arteries (8), compression of airways with “air-trapping”(2), thrombosed aneurysm of the duct (4), 3 with extension of the into the left PA and PPS. In 7 patients premature delivery was chosen to avoid further damage of the right heart & lungs. Neonatal treatment varied from observation (5), oxygen administration only (13), ventilation with pulmonary vasodilators (12),ECMO (1), heparine IV (3) Late treatment (7): thrombectomy of the PA (2); balloon dilation PS. (3), RVOT plasty (1), homograft RVOT (1), mitral valve plasty for CCMP with severe MR (1). 3(10%) Pts died in the neonatal period: 2 with massive TR and functional PA, 1 with severe respiratory insufficiency due to microcystic lung disease – air trapping. (14)45% went to cardiopulmonary normalisation, 14(45%) had residual lesions: PS (5), supraPS-PPS (6), CCMP (1), PI (3), TR (2/31).

Conclusions: Fetal dysfunction of the arterial duct can stress different levels of the right heart and pulmonary vasculature, resulting in a very wide range of pathology. The clinical outcome ranges from normal to residual hemodynamic lesions or death. Premature delivery might be indicated in selected patients.