Foetal Dysfunction of the Arterial Duct: Clinical Spectrum and Outcome

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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.