

Prenatal diagnosis of single ventricle physiology impacts morbidity and mortality

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Introduction (or Basis or Objectives): *Objectives:* Single ventricle (SV) lesions are most often detected in fetal echocardiography. We sought to evaluate the impact of prenatal diagnosis on morbidity and mortality.

Methods: All consecutive patients born between 2001 and 2013 with pre- or postnatal diagnosed SV and birth weight >1800g from 1/2001 until 6/2013 were reviewed. Primary endpoint was 30days survival rate after Hemifontan palliation. Secondary endpoints were condition at admission, neonatal mortality (30d) and hospital morbidity after the first operation.

Results: 259 cases with SV physiology 160(62%) were prenatally diagnosed. After termination of pregnancy, intrauterine demise and comfort care a total of 181 alive newborns were admitted to our center for treatment. One patient died for non-cardiac cause. Thus 87 fetal cases and 93 postnatal cases were analysed. Prenatal and postnatal anatomical diagnoses showed similar distribution, including hypoplastic left heart syndrome 40/35%, atrioventricular septal defect 10/11%, tricuspid atresia 15/10%, double inlet left ventricle 14/13%, double outlet right ventricle 9/13%, others 12/18% and right ventricular predominance 56/55%. High-risk patients were equally present in both groups, and consisted of restrictive foramen or obstructive pulmonary veins 8/8%, right atrial isomerism3/2%, left atrial isomerism4/2%). Patients with a prenatal diagnosis were born earlier (38.2 ± 1.4 versus 39.3 ± 1.5 , $p < 0.0001$), but birth weight was not significantly different (3033 ± 453 g versus 3167 ± 613 ,g $p = 0.09$). Lactate at admission was more often > 10 mmol/l in postnatal cases (9/93 versus 1/87; $p = 0.02$). PH at admission was more often < 7.20 in postnatal cases than in prenatal diagnosed cases (10/93 versus 1/87; $p = 0.001$). Postnatal diagnosed children presented at admission with higher dose of prostaglandin ≥ 0.05 mcg/kg/min (14/93 versus 2/87, $p = 0.003$) and required more often mechanical ventilation (25/93 versus 2/87; $p < 0.0001$). Neonatal mortality was significantly higher in postnatal diagnosed children (14% versus 4.6%, $p = 0.03$). Overall mortality until 30d after Hemifontan palliation, including transplantation in one prenatal case, was also higher in postnatal diagnosed patients (24.7% versus 12.6%; $p = 0.04$).

Conclusions: Prenatal diagnosis helps reducing neonatal morbidity and mortality in children with single ventricle physiology. Overall mortality remains significantly lower until 30 days after Hemifontan palliation in prenatal diagnosed compared to postnatal diagnosed cases.