Abstract half time review Katrin Fricke

**Title:** Perinatal risk factors for morbidity and mortality in patients with left heart anomalies

PhD student: Katrin Fricke  
Main supervisor: Petru Liuba  
Co-supervisors: Erik Hedström, Katarina Hanséus, Constance Weismann  
Institutionen för kliniska vetenskaper, Lund

**Background:**  
Neonatal aortic coarctation (CoA) and hypoplastic left heart syndrome (HLHs) are 2 important types of left sided obstructive congenital heart lesions. If undiagnosed, CoA may lead to cardiovascular collapse and death when the arterial duct closes. Fetal detection of CoA is still associated with high false-positive detection rates. Neonatal surgical repair is associated with approximately 20 % rate of re-CoA. Borderline left ventricle (bLV) refers to a spectrum of moderately underdeveloped left heart structures in fetal life. Some of these patients have no evidence of postnatal left heart obstruction whereas in others left heart size is inadequate for biventricular circulation (HLHs). Surgical palliation of HLHs is still associated with significant risk of severe complications.

**Aims:**  
1) to improve prenatal diagnosis of CoA and identify predictors of re-CoA  
2) to identify prenatal predictors of postnatal outcome in fetuses with bLV  
3) to identify pre-and postnatal predictors for adverse outcome in patients with HLHs

**Preliminary Results:**  
**Study I**(completed/ref 1): Retrospective inclusion of 65 fetuses born 2010-2018 with prenatal suspicion of isolated CoA. Postnatal CoA can be accurately predicted using the carotid-subclavian artery index or the aortic isthmus-to-duct ratio in the three-vessel trachea view and the mitral-to-tricuspid valve ratio.  
**Study II**(under way): prospective study of fetuses with HLHs, bLV, and CoA suspicion for prediction of postnatal outcome. Fetal cardiovascular magnetic resonance imaging (MRI) and echocardiography (echo) are used. To date 48 fetuses are included.  
**Study III**(under way): prospective study on restenosis after neonatal CoA-repair using MRI, echo and circulating biomarkers. To date 27 patients are included.  
**Study IV**(completed/ref 2): retrospective study of 167 patients with HLHs and Norwood stage 1 palliation (S1P) between 1999-2018 in Sweden. A globular left ventricle, present in all patients with aortic atresia and mitral stenosis and in some patients with other anatomic subtypes, is an independent risk factor for adverse outcome. S1P with Blalock-Taussig shunt in these patients increases further this risk.

**Significance:**  
Better prenatal assessment of CoA, outcome of bLV and risk stratification of HLHs is expected to improve counselling and use of health care resources. Further identification of risk factors for postoperative complications after CoA and HLHs are expected to lead to more tailored clinical management to lower the morbidity in these cohorts.
Published and submitted manuscripts:


Publications and submissions not included in the PhD:

