

Background and aims To determine whether stratification of complexity methods in congenital heart surgery (RACHS-1, Aristotle and STS-EACTS) fit to our centre and determine the best method in discriminating hospital mortality.

Methods Surgical procedures in patients under 18 age were allocated to the categories proposed by the three methods currently available. The outcome in-hospital mortality was calculated for each category. Statistical analysis using the chi-square Pearson test was performed to verify whether the categories presented different mortalities. The categories' discriminatory ability of each method was determined by calculating the area under the ROC curve and a comparison between the curves was performed.

Results 360 patients were allocated by the 3 methods. There was a statistically significant difference between the mortality categories: RACHS -1(1) - 1.3%; (2) - 11.4%; (3) - 27.3%; (4) - 50%, (p < 0.001), Aristotle (1) - 1.1%; (2) - 12.2%; (3) - 34%, (4) - 64.7%, (p < 0.001) and STS - EACTS (1) - 5.5%, (2) - 13.6%, (3) - 18.7%, (4) - 35.8%, (p < 0.001). The three methods had similar accuracy by calculating the area under the ROC curve (RACHS - 1-0.738; STAT - 0.739; Aristotle - 0.766).

Conclusion The three methods of stratification of complexity currently available in the literature are useful with different mortalities among the proposed categories and similar discriminatory capacity for in-hospital mortality in our centre.

PS-028 NEUROCOGNITION IN CHILDREN WITH CONGENITAL HEART DISEASE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background and objective Children with congenital heart disease (CHD) may experience difficulties in academic and daily life functioning. Intelligence and neurocognitive skills have been associated with these difficulties. The aim of this systematic review and meta-analysis is to assess intelligence in comparison with neurocognitive skills, like memory, attention and executive functions, in children with CHD.

Methods A comprehensive search of electronic databases PubMed, Embase and Cochrane was conducted for studies measuring intelligence, memory, attention and executive functions in children with CHD. Standardised mean differences (SMD's) between the CHD-group and a healthy control group were calculated for these neurocognitive functions.

Results 28 studies were retrieved, of which 10 tested a healthy control group. Children with CHD (median age 7.4 years; median sample size 20) scored worse than healthy control

children for all investigated neurocognitive functions. A medium effect size was found for intelligence (SMD = -0.53 [95% CI: -0.71 to -0.35] p < 0.00001). Effect sizes, ranging from -0.41 to -0.53, were similar for memory, global executive function and non-reaction time measures of attention and executive functions. Executive function reaction time had the largest effect size (SMD = 0.76 [95% CI: 0.48 to 1.05]; p < 0.00001).

Conclusions Children with CHD risk lower performance on intelligence and neurocognitive skills. Only executive function reaction time showed a large effect size. A high diversity in research practices and small sample sizes were also ascertained. Large, more standardised, long-term follow-up studies of neurocognitive skills are required for a better understanding of these deficits and their impact on daily life functioning.

PS-029 THE EFFECT OF CONGENITAL CYANOTIC AND ACYANOTIC HEART DISEASE (CHD) ON INTRAUTERINE GROWTH

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Introduction The heart-placental axis utilises many common molecules and genes and reflects intimate and synergistic growth of both organs. Abnormal cardiac development leading to CHD can be associated with abnormal placentation and abnormal transfer of nutrients and oxygen.

Objectives We measured the anthropometric parameters (length, weight and head circumference) and the placental weight of 49 FT newborns (gestation period > 36 weeks) infants with CHD {(cyanotic (n = 8) and acyanotic (n = 41)} diagnosed clinically and by echocardiography and compared these data with those for randomly selected normal FT newborns (n = 104).

Results Newborn infants with CHD were significantly shorter and had lower birth weight and smaller head size compared to normal newborns. Their placental weights were significantly decreased compared to those for normal newborns. However, there was no statistically significant difference in the anthropometric parameters of infants with cyanotic versus acyanotic heart disease.

Discussion The intrauterine growth restriction in newborn infants with CHD may represent an adaptive mechanism to cope with the compromised perfusion caused by the congenital cardiac anomaly. However, this restricted growth can pose a risk for postnatal development in these infants.

Conclusion In this study CHD was associated with significant affection of birth weight, length and head circumference and lower placental weight compared to normal newborns.

Abstract PS-029 Table 1

Anthropometric data and placental weight in newborn infants with congenital heart disease (CHD) versus normal.				
	Placental wt (g)	Birth Wt (g)	Birth length (cm)	Head circumf (cm)
Normal newborns n=104	677.6	3185.3	50.6	34.0
CHD newborns n=49	597.3*	2600 *	46.4*	31.7*
Acyanotic n= 41	588.64	2510.0	45.98	31.51
Cyanotic =n= 8	640.00	2870.0	48.56	32.69
* p < 0.05				

PS-030

CONGENITAL HEART DISEASE AND MICROCEPHALY AT BIRTH: A DANISH POPULATION-BASED COHORT STUDY OF CHILDREN WITH DOWN SYNDROME

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Background and aims Neurodevelopmental disorders are common in children with congenital heart disease (CHD) and largely ascribed to prenatal factors such as impaired cerebral growth. It remains to be established whether this is due to impaired intrauterine cerebral blood flow or genuine genetic causes. Down syndrome (DS) is a known cause of CHD, neurodevelopmental disorders and microcephaly. Hence, studies on DS may provide insight into the causes of impaired cerebral growth in CHD. We aimed to assess the risk of microcephaly in children with DS and CHD compared to children with DS and no CHD.

Methods Children with DS (n = 389) and specific birth characteristics were identified in national registries. Head circumference and the risk of microcephaly (head circumference <-2SD) was compared between children with CHD (n = 168) and children without CHD (n = 221) by linear and logistic regression analyses (unadjusted and adjusted for gender and gestational age).

Results There was no difference in head circumference between the groups, 0.0 cm (95% CI -0.4–0.4). Adjustment did not significantly alter the results. The risk of microcephaly was slightly higher in newborns with CHD, OR 1.4 (95% CI 0.8–2.6). Adjustment did not significantly alter the results.

Conclusions We did not find indications of impaired head growth in children with DS and concomitant CHD. There might be a slight increase in the risk of microcephaly. We suggest that the most common types of CHD in DS i.e. atrioventricular septal defects, ventricular septal defects and atrial septal defects do not impair prenatal cerebral growth in children with DS.

PS-031

CONGENITAL HEART DISEASE IN THE IN-VITRO FERTILISATION PREVALENCE DISTRIBUTION

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Introduction A higher prevalence of all congenital malformations in children conceived through assisted reproductive technologies (ART) was fairly extensively suggested in literature. However, there are few studies which only address congenital heart disease (CHD) specifically and most have examined data from registers. The aim of this study was determined the prevalence of CHD in fetus and newborn conceived by ART and comparison with newborn in outpatient obstetric clinics. All data was collected in a specialist paediatric service in the Taichung Taiwan.

Methods This study was detected fetus and newborns with CHD. All pregnancies treated by ART who received fetal

echocardiography between gestational age from 20 to 24 weeks and examine done month after delivery or reported by echocardiographic screening from their birth hospital. The controlled group was normal conceived newborn receiving postnatal echocardiographic screening at age of one week at the same area in Taichung city.

Results Among 2,780 fetus in ART, the prevalence of major CHD with immediate life-threatening risk and overall CHD were 503.5/100,000 (n = 14) and 1,223/100,000 (n = 34), respectively. In comparison with control group of 12,022 newborn, the major CHD was 2 times of normal pregnancy but all CHD were only one half of normal pregnancy. In assisted conception were observed increased in a number of individual subgroups rates, the highest among those with pulmonary atresia.

Conclusions We found no increased risk of overall CHD but more risky in major CHD in those conceived by ARTs. Further analysis of individual subgroups of CHD and different methods of conception is required. Prenatal echocardiographic screening can play a useful tool for early detection of major CHD in ART to improve the outcome of CHD.

PS-032

PERFUSION INDEX IN PRETERM INFANTS DURING THE FIRST 3 DAYS OF LIFE

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Background and aim The waveform amplitude produced by pulse oximeters can be expressed as an index of pulsatile vs. non-pulsatile signal. This perfusion index (PI) has been shown to correlate with cardiac output, stroke volume, and superior vena cava flow. The aim was to gather PI reference data in preterm infants and to explore if the PI is associated with common clinical parameters.

Patients/methods The PI was recorded in 312 neonates <32 weeks GA during the first 72 h of life. Mixed-effects modelling was applied with PI as the dependent variable and the individual patient as a random factor. Subsequently the association with clinical parameters (i.e. GA, birth weight, IVH, PDA, inotropes) was explored.

Results Mean GA was 28.5 weeks (SD ± 2.1). A quadratic model (0–24 h) combined with a linear model (24–72 h) provided the best fit. The lowest PI was reached 12–18 h after birth, thereafter gradually increasing until 72 h postnatal age. For the first 24 h PI was associated with gender (coefficient 0.05, p = 0.04), inotrope administration (-0.123, p < 0.0001), pulse pressure (0.014, p < 0.0001), SaO₂ (-0.015, p < 0.0001), MABP (-0.013, p < 0.0001), and GA (0.014, p = 0.0168). After the first day, only associations with, inotrope administration (-0.17, p < 0.0001), pulse pressure (0.007, p < 0.0001), MABP (-0.014, p < 0.0001), and SaO₂ (-0.01, p < 0.0001) remained. No association was found with, IVH, PDA, fluid boluses, or birth weight.

Conclusions The evolution of PI values over time probably reflects transitional physiology. The associations with pulse pressure, MABP, and inotrope administration suggest that the PI might have an application in blood pressure management.