Background and aims: Neurodevelopmental disorders are common in children with congenital heart disease (CHD) and largely ascribed to prenatals factors such as impaired cerebral growth. It remains to be established whether this is due to impaired intraterine 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.

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 half one 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.