Congenital Heart Disease in a Population of Twins: the role of Assisted Reproduction Technology

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Introduction: There is increased incidence of congenital anomalies in neonates resulting from twin gestations. Assisted reproduction technology which is related to increased rates of twinning has also been associated with increased risk of birth defects. We studied the incidence of congenital heart disease in a population of twins and its relationship with assisted reproduction.

Methods: Data concerning 849 live-born twin neonates (of which at least one of the co-twins) was admitted in the Neonatal Intensive Care Unit during 1995-2011 were analysed. Forty-four % (189/429) of the gestations were the result of assisted reproduction (which was defined as in vitro fertilisation or intracytoplasmic sperm insertion).

Results: In the assisted reproduction group 29/373 (7.8 %) had congenital heart disease compared to 20/476 (4.2 %) neonates conceived naturally (p=0.037). The spontaneous conception gestations had higher incidence of monochorionic placentation (47/240 versus 4/189, p<0.0001) and included mothers who were younger (29.1±4.7 years versus 33.9±5.2 years, p<0.0001) and had a higher parity (median 2, range 1-7 versus 1, range 1-4; p<0.0001) compared to the assisted reproduction gestations. Multinomial logistic regression analyses using fetal chorionicity and gender, maternal age and parity as covariates, showed that assisted reproduction and monochorionic placentation were both significant determinants of congenital heart disease (Exp(B)=2.534, p=0.016 and Exp(B)=3.058, p=0.007, respectively) and major birth defect (Exp(B)=2.287, p=0.004 and Exp(B)=2.195, p=0.022, respectively).

Conclusions: There is increased incidence of congenital heart disease and birth defects as a whole in twins resulting from assisted reproduction. Although in vitro fertilisation and intracytoplasmic sperm insertion are considered safe procedures both for the mother and the offspring, detailed antenatal screening including fetal echocardiography should probably be offered to pregnant women carrying multiple fetuses, especially post artificial reproduction.