Mortality and Morbidity in Premature Infants with Congenital Heart Disease

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Background

Congenital heart disease (CHD) is the most common congenital malformation with an incidence of 11-14 per 1000 live births. Those born with CHD are more likely to be born prematurely¹, and have a significantly increased risk of mortality compared infants with CHD born at term^{2,3}. Few studies have directly compared the effect of CHD on rates of mortality and incidence of morbidities within a preterm population, particularly at the extremes of prematurity.

Aim

To compare mortality and the incidence of common neonatal morbidities in those born at <36 weeks gestation with and without CHD.

Methods

Data were collected for all infants born at <36 weeks gestational age with CHD between 2005-2017 at a specialist neonatal cardiac centre. All data were collected from electronic patient record databases (Badgernet and HeartSuite). Infants were said to have CHD based on a fetal or postnatal diagnosis of congenital heart disease. Each infant with CHD was compared to 2-3 controls matched for gestation, weight and gender. Infants with patent ductus arteriosus alone were excluded.

Results

A total of 247 infants diagnosed with CHD with a median gestational age 33 weeks (23.14-35.86), birth weight 1670g (970-3640) and 55.9% being males, were compared to 584 matched controls without CHD

Table 1. Mortality by gestation compared with controls.

Gestation	N (N with CHD)	CHD (%)	Controls (%)	Odds Ratio (95% confidence interval)	P Value
24-26 ⁺⁶	107 (31)	5 (16)	16 (21)	1.0 (0.37-2.75)	0.98
27-32 ⁺⁶	367 (103)	25 (24)	4 (2)	34.0 (10.06-114.63)	<0.0001
33-35 ⁺⁶	357 (113)	21 (19)	5 (2)	14.3 (5.31 -38.37)	<0.0001
Total	831 (247)	51 (21)	25 (4)	5.3 (3.21-8.77)	<0.0001

Table 2. Mortality by complex and simple CHD compared with controls.

	N (N with CHD)	CHD (%)	Controls (%)	Odds Ratio (95% confidence interval)	P Value
Simple CHD	237 (70)	5 (7)	14 (8)	0.84 (0.29 -2.43)	0.74
Complex CHD	594 (177)	47 (27)	12 (3)	12.20 (6.28 -23.70)	<0.0001

Figure 1 – Comparison of incidence of Necrotizing Enterocolitis

Figure 2– Comparison of incidence of Sepsis

Figure 3 – Comparison of incidence of Intraventricular Hemorrhage

Conclusion

Our data show a significantly increased risk of mortality in premature infants with CHD when compared to prematurity alone. This is of particularly significance in infants born between 27-36 weeks gestation and in those born with severe congenital heart defects. Furthermore, there is an increased risk of commonly occurring morbidities such as sepsis and necrotizing enterocolitis.

References

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