Significance of Social Deprivation and Modifiable Risk Factors in the Aetiology of Congenital Heart Defects


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Introduction: The incidence of congenital heart disease (CHD) in Wales is two to three times the UK national average (Wales 10/1000 vs UK 4/1000). The reasons for this increased incidence have not been ascertained. Therefore, we retrospectively studied the frequency and importance of social deprivation and other modifiable risk factors among the patients referred for a fetal cardiac scan to our institution over the past 12 years.

Methods: All patients from South Wales who had a fetal cardiac anomaly scan between 2001 and 2013 were included. The demographics, social deprivation indexes, maternal, familial and fetal exposures to potential risk factors and their correlation with ultrasound findings were evaluated. The results obtained from those with a diagnosis of CHD were compared to a control group with normal scans.

Results: 2701 fetuses had cardiac scans between 2001 and 2013. 751 (27.8%) of these were abnormal. A strong correlation between CHD and social deprivation was identified, with CHD being twice more common in those patients from the areas with a higher level of social deprivation. However, there was no significant difference in smoking rates, maternal medication, alcohol consumption and maternal age between the two groups. Genetic abnormalities were 8-fold more common in those with a fetal diagnosis of CHD compared with the control group of normal scans (12.4% versus 1.6% respectively, OR 9.0 [CI 4.3-19.1] p<0.0001). There was a three-fold increase in the number of patients with insulin-dependent diabetes between those with abnormal and those with normal scans (3.6% versus 1.2% respectively, OR 3.08 [1.21, 7.81], p=0.018).

Conclusions: Our study suggests that social deprivation have a strong association with CHD and common risk factors such as maternal IDDM and genetic abnormalities. These findings highlight the need for more comprehensive prospective data collection to determine the true nature and extend of modifiable risk factors in the aetiology of congenital heart disease.