PW2-4

Evidence of Seasonality in Births of Patients with Congenital Heart Disease Who Require Subsequent Surgical Repair

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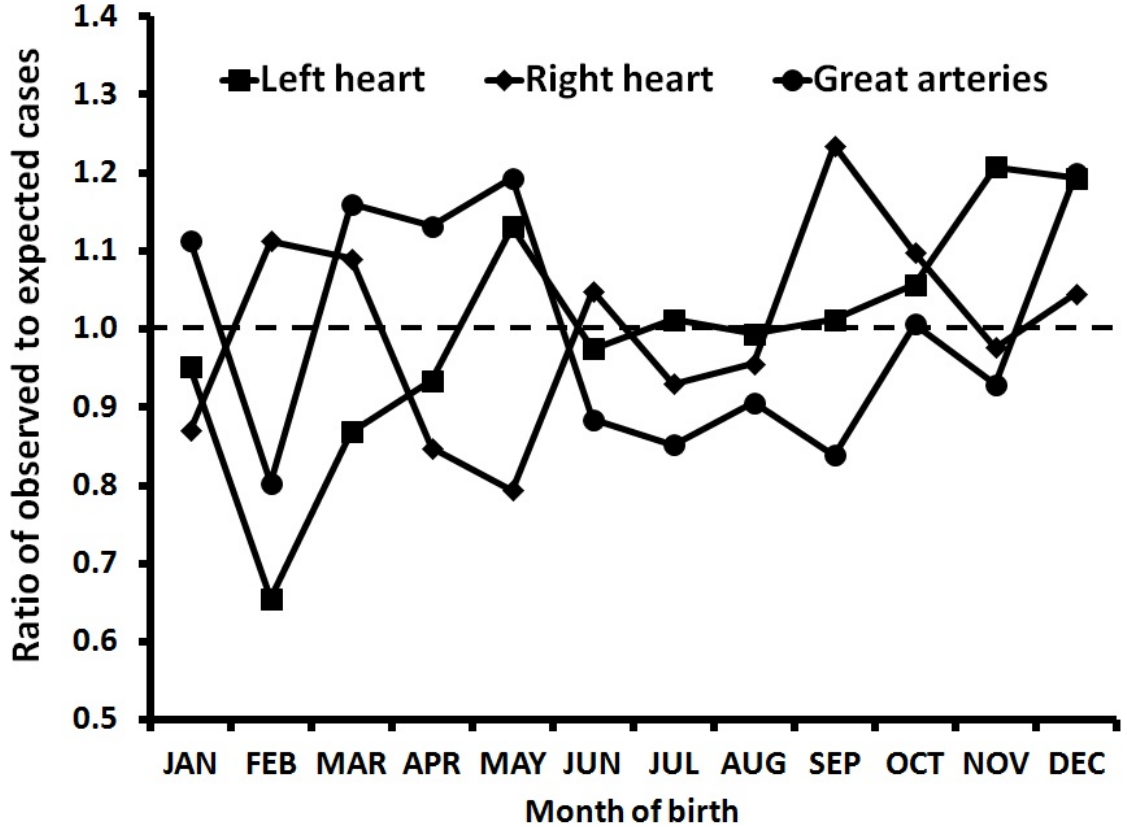
Introduction: Patients born with multiple congenital defects are known to occur in seasonal clusters. Anecdotal and limited evidence of such an effect for patients with congenital heart disease (CHD) has been reported. We sought to determine whether such seasonality might be observed for patients born with CHD who require subsequent surgical repair, and to explore variations across major anatomical types.
Methods: All patients who underwent cardiac surgery for a CHD between 2002 and 2010 were included. Patients were classified into major anatomic groups based on their primary diagnosis. Duplicate entries (i.e. multiple surgeries on the same patient) were removed. The total number of births per month associated with each diagnosis was calculated. This was compared to the expected number of births for each month using moving average methodology adjusted for natural monthly variation in the birth rate as determined by Census Canada population statistics. The relative difference between the observed and expected number of CHD cases (ratio) for each calendar month was calculated and compared to the null hypothesis of no seasonal effect.
Results: N=3,775 patients were included. For all patients, the ratio of observed and expected number of CHD cases ranged from 0.87 in February to 1.10 in May; this was statistically significant for February (lower than expected, p=0.002), November and December (higher than expected, p=0.03 and p=0.008 respectively). Seasonal variation was significantly associated with anatomical type of CHD. For patients with left heart lesions and septal defects (N=1,716), February and March had a deficit of cases compared to expected, while May, November and December were associated with an excess of cases. For right heart lesions (N=463), April and May were associated with a deficit of cases, while excess cases were noted in September. Finally for patients with abnormalities of the great arteries and the aorta (N=742), February and June-September were associated with a deficit of cases while December and March through May were associated with an excess of cases.



Conclusions: Differences in seasonal patterns between the 3 major anatomical groups of CHD exist, and may indicate a potential etiologic effect of environmental influences or possible gene-environment interactions.