LETTER TO THE EDITOR

Effect of fathers' age and birth order on occurrence of congenital heart disease

A case-control analysis studying the effect of paternal age and parity on the occurrence of congenital heart disease was recently reported.[1] The study was based on 497 cases aged between 3 months and 5 years, born in Beijing and Hebei Province, China. The control population was made up of two groups: 222 infants resident in Beijing or Hebei and treated in hospitals, and community controls: 6000 infants born in Beijing or one region of Hebei Province. When studying the effect of father's age on heart defects, the authors found a Mantel-Haenszel odds ratio of 2·63 for <25 years (after controlling for birth order) with a 95% confidence interval (95% CI) of 2·12–3·27. Similar findings were obtained when controlling for maternal age but data were not shown.

We report here a Swedish case-control study in which we investigated the possible effect of paternal age on the occurrence of congenital heart disease. The effects of maternal age and parity have been discussed in a previous paper.[2] Cases are all infants born in 1985–1986 in Sweden and presenting a major congenital heart defect, usually diagnosed by echocardiography, cardiac catheterisation, at operation, or at necropsy. These infants were identified from two Swedish registries: the Registry of Congenital Malformations[3] and the Child Cardiology Registry.[4] Cases with a known chromosomal anomaly have been excluded from the material. Two sets of controls were used: a group of 776 infants randomly selected from the Medical Birth Registry among all infants born in the same year at the same delivery unit as the cases,[5] and all births in 1985–1986, that is 172 840 infants.

We first studied the possible effect of paternal age on the occurrence of congenital heart disease, stratifying for maternal age and parity. The table gives for each paternal age class the number of cases and controls and the odds ratio with its 95% confidence interval. No paternal age effect is observed. In each class, the odds ratio is very close to 1, except for fathers older than 44 years (OR = 1·52, CI 0·57–4·06) but the number of cases and controls is very small (7 and 9, respectively). Using all births in 1985–1986 as a control group, the possible effect of paternal age after standardisation for maternal age was studied for all cardiac defects and for two large groups of defects: truncus anomalies and septal defects. Only cases without other cardiac anomalies were included. These two types of congenital heart disease are part of a classification described elsewhere.[2] The table summarises the results. No effect is observed.

Few studies on the possible effect of paternal age on the occurrence of congenital heart disease have been reported. If such an effect exists, the biological mechanism involved is difficult to understand. In this study, no association appears between paternal age and congenital heart disease and, as Zhan et al suggested, the results of their study could be biased.[1] Although it is reasonable to think that no effect exists, more studies are needed to determine the possible role of the age of the father on the occurrence of congenital heart defects.

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Effect of paternal age on the occurence of congenital heart disease (CHD). For all CHD as a group, the odds ratios, calculated by Mantel-Haenszel technique after stratification for maternal age and parity, are given with their 95% confidence intervals (95% CI). Observed/expected rates calculated from all births in 1985–1986 and after standardisation for maternal age are also given for all CHD and for two types of CHD: truncus anomalies and septal defects (without other cardiac defects). When the number of cases was less than 10, the exact 95% CI was obtained from Poisson distributions.

	Paternal age (years)					
	<25	25–29	30–34	35–39	40–44	>44
All CHD						
Number of cases	34	119	131	65	24	7
Number of controls	79	233	264	138	53	9
Odds ratio	0·92	1·11	1·01	0·92	0·82	1·52
95% CI	0·56–1·49	0·83–1·50	0·77–1·33	0·65–1·32	0·48–1·39	0·57–4·06
Observed/expected	0·89	1·04	1·06	0·89	1·03	0·98
95% CI	0·64–1·25	0·87–1·24	0·89–1·25	0·70–1·14	0·69–1·53	0·39–2·01
Truncus anomalies						
Number of cases	13	43	47	18	6	2
Observed/expected	0·91	1·04	1·14	0·80	0·84	0·92
95% CI	0·53–1·57	0·77–1·40	0·86–1·52	0·50–1·26	0·31–1·83	0·11–3·33
Septal defects						
Number of cases	5	16	25	12	4	3
Observed/expected	0·90	0·84	1·14	0·93	0·95	2·27
95% CI	0·29–2·09	0·51–1·37	0·77–1·69	0·53–1·64	0·26–2·42	0·47–6·64
Number of births	18 492	54 549	55 814	30 731	10 038	3216

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