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. 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. Cases are all 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 and the Child Cardiology Registry. 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, 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. 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. Although it is reasonable to think that no effect exists, more studies are needed to determine the possible role of the father on the occurrence of congenital heart defects.

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