Health status of young adults conceived by assisted reproductive technology: is there cause for concern?

Although pregnancy outcomes among conceptions with assisted reproductive technology have received considerable attention recently (1, 2), longer-term health, developmental, educational, psychosocial, and socioeconomic outcomes are less well studied. In part, this reflects the relative recentness of developments in the field of reproductive endocrinology, but now, as the second decade of the 21st century comes to a close, we have more than 40 years of experience to reflect on. The study by Halliday et al. (3) compares health outcomes in a cohort of assisted reproductive technology (ART)– and non–ART-conceived singleton adults from Victoria, Australia, who were 22–35 years of age at the time of this study. Outcomes include socioeconomic and psychosocial measures, as well as clinical measures of vascular, cardiometabolic, anthropometric, and respiratory health.

Considering the null hypothesis of no differences between the two groups, the results of this analysis seem reassuring. In early adulthood, Halliday et al. (3) find no differences in socioeconomic measures (educational attainment, financial and employment status, and lifestyle behaviors [exercise, smoking, alcohol use]). If anything, those in the non-ART group have more adverse outcomes; for example, according to Table 1, 70.7% of those conceived with the use of ART were in a committed relationship or living with a partner, compared with 57.2% in the non-ART group ($P<.05$), a finding not reported in the table owing to use of an overall Chi-square test. The results from the WHO Quality of Life BREF (WHOQOL-BREF) (Table 1 in Halliday et al. [3]) show that the ART group had better outcomes in all four domains of physical and psychologic health, social relationships, and environment. Halliday et al. find few differences in health-related outcomes as well. Although those conceived by ART were somewhat more likely to report asthma or lung or breathing problems (Table 3 in Halliday et al. [3]), there was no difference in the prevalence of ongoing asthma, and this was the only self-reported health condition in a list of 20 conditions for which any statistical difference was noted. No differences in anthropometry, cardiovascular measures, fasting blood pathology, or respiratory function were found, with the exception of slightly better level of adjusted mean difference in brachial and central aortic diastolic blood pressure among men conceived by means of ART. Given 40 comparisons in Table 4 in Halliday et al. (3), finding two significantly different is within the range to be expected by chance at alpha $<.05$. The authors are to be commended for including a table examining potential sources of bias in their study owing to the relatively low participation rates in this study from their original sample (Table 2).

Shankaran surveyed the range of outcomes associated with ART from infancy into adulthood, touching on child and adolescent health outcomes and behaviors as well as metabolic syndrome and several chronic diseases (4). Although the Halliday et al. (3) study adds to the knowledge base, many unanswered questions remain. Do men or women conceived with the use of ART have impaired fecundity or fertility? Does ART impart any epigenetic effects on offspring or their descendants? Halliday et al. (3) adjust for several covariates measured at birth, but were unable to take life course experiences into account (5). A fuller exploration of the topic requires larger and more diverse samples capable of examining differences in reproductive history, race/ethnicity, and measures of socioeconomic status, as well as prospectively collected measures of parent-child interaction and child health status, adverse childhood experiences, familial socioeconomic status during childhood and adolescence, and measures of adult outcomes into the middle age years. Hopefully, research along these lines will become available over the next decade.

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