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Is first-trimester crown–rump length associated with birthweight?

Sir,

We read with interest the article by Salomon et al.¹ They studied 317 pregnancies conceived by *in vitro* fertilisation (IVF) and have suggested that differences in first-trimester crown–rump length (CRL) are associated with variations in birthweight. An argument is proposed suggesting that different growth trajectories become evident at 11–14 weeks of gestation. This is in contrast to larger first-trimester studies of multiple biochemical and biophysical parameters indicating that variation in CRL is not associated with variation in birthweight.²

We noted that the authors used the IVF treatment diary to date the pregnancies; they added 14 days to the date of oocyte retrieval. We wondered why they chose the date of oocyte retrieval and not the embryo replacement date for this purpose. Furthermore, what did they do in the instance of ovum donation or frozen embryos taken from several months or years before? How did they account for the variability in immediate versus blastocyst transfer with IVF? Some have suggested that a correction factor can be applied for the latter scenarios, but the accuracy of this correction relies entirely on the assumption that the embryonic growth rate is unchanged under different fertilisation regimens and during the early embryonic phase. Finally, did they account for the growth restricting effects of vanishing twins from spontaneously reducing multiple pregnancies?³

It is a simple fact that IVF treatment has now become so varied and complicated that we cannot presume that the oocyte retrieval dates are an accurate proxy for a natural cycle conception. Indeed, we examined over 400 IVF pregnancies and demonstrated that dating by the IVF treatment diary results in significant, but consistent differences in both first-trimester and second-trimester fetal biometry in singleton and twin pregnancies.^{4,5} To us, the obvious conclusion of these papers is that fertility treatment diaries cannot be reliably used to date IVF pregnancies.^{1,4,5}

We wondered if the authors ever considered the possibility that their findings were the result of inaccurate dating

from the IVF treatment diary rather than from differential fetal growth trajectories in the first trimester. Their own data show that there are systematic differences in the IVF population compared with natural conceptions. For example, the mean CRL and birthweight *z*-scores of the data should be 0, but they are negative for the first three quartiles. This may be a result of the inaccuracy of the equations used to calculate the *z*-scores, but is more likely to do with population dating.

It is possible that if the pregnancies were dated by the CRL measurement, the association with birthweight would become non-significant. The authors could easily do this analysis, as it is a fairly simple statistical exercise to conduct on the data they already have. If the association between CRL and birthweight becomes non-significant, it would support the important assertion that we should date even IVF pregnancies by 11–14 weeks CRL measurements. The major objection to this policy is that it relies on the assumption that every baby is exactly the same length at the same duration of gestation. We make this assumption for spontaneously conceived pregnancies (National Institute for Clinical Excellence guidelines) to more accurately predict the most likely date of delivery in the context of an unknown date of conception. However, clinicians seem wedded to the practice of dating by conception date in IVF pregnancies despite mounting evidence that the latter is less reliable than ultrasound estimation. ■

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