Is the rate of pre-and postnatal karyotype aberrations in pregnancies conceived by assisted reproductive technology correlated to the type of treatment?

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Objective

To assess the rate of pre- and postnatal karyotype aberrations in a national cohort of assisted reproductive technology (ART) pregnancies compared with a population of spontaneous conceived pregnancies (SCP).

Methods

This national cohort study included pregnancies with a nuchal translucency scan performed from the 1st January 2008 to the 31st December 2010, retrieved from the National Danish Fetal Medicine Database. Women pregnant by ART were identified by cross-linkage with the Danish IVF-Register. The ART cohort consisted of 2881 IVF and 2549 ICSI pregnancies and the spontaneously conceived cohort of 151325 pregnancies. There was a total of 98. 1% singleton and 1. 9% twin pregnancies.

Results

The overall invasive testing rate was 5. 0 % and 8. 8 % (777/8833) of the prenatal karyotypes were abnormal. The invasive testing rate was significantly higher in the IVF and ICSI groups (9. 7% and 8. 9 %) compared with SCP group (4. 8%), p< 0. 0001. Furthermore the ART group was older than the SCP (32. 7 versus 29. 7 years, p < 0. 001). The overall rate of pre-and postnatally detected chromosomal aberrations was 0. 61% (971/159832). There were significantly more chromosome aberrations in the ART group compared with the SCP group, 0. 95 % (61/6365) and 0. 60 % (910/153467). After adjusting for maternal age, this difference was no longer significant. Chromosome aberrations were not more common in the ICSI-treated group compared with the IVF-treated group, 1. 03%, (32/3020) versus 0. 89%, (29/3345), p> 0. 05.

Conclusion

ART treatment no longer seems to be associated with an increased risk of chromosome aberrations.

Table 1: The rate of detected abnormal karyotypes found both pre-and postnatally according to method of conception

Conception (n)	Total abnormal karyotypes, n (%)	Autosomal Aneuploidy, n (%)	Sex chromosome aneuploidy, n (%)	Sex chromosome structural abnormalities, n (%)	Autosomal structural abnormalities n (%)
IVF 3345	29 (0.89)	22 (0.66)	0 (0)	1 (0.03)	6 (0.18)
ICSI 3020	32 (1.05)	19 (0.63)	4 (0.1)	0 (0)	9 (0.29)
SCP 153467	910(0.59)	574 (0.37)	107 (0.07)	15 (0.01)	214 (0.14)
Total 159832	971 (0.61)	615 (0.39)	111 (0.07)	16 (0.01)	229 (0.14)