

Introduction and methods

IVF has been shown to increase the rate of monozygotic twinning pregnancy when compared with spontaneous pregnancy. The literature on single blastocyst transfer resulting in monozygotic dichorionic-diamniotic (DC-DA) twins is extremely limited. We aim in this study to report cases of in vitro fertilization and frozen-thawed embryo transfer (IVF-FET) with single blastocyst transfer resulting in di- or tri-chorionic pregnancies.

This is a retrospective case series. All frozen-thawed blastocyst transfer cycles performed between June 2013 and December 2018 at the Shanghai Ji Ai Genetics and IVF Institute, Obstetrics and Gynecology Hospital, Fudan University, Shanghai, China, were reviewed retrospectively. Cycles with more than one blastocyst transfer were excluded. Cycles were analyzed to determine if clinical pregnancy occurred with the presence of two or more gestational sacs noted on ultrasound performed at 4 weeks after single blastocyst transfer. We performed an in-depth review to further exclude dizygosity twins such as fetal/neonatal sex discordance and natural cycle FET.

Results

Five thousand four hundred fifteen women underwent frozen-thawed single blastocyst transfer between June 2013 and December 2018 at the Shanghai Ji Ai Genetics and IVF Institute, Obstetrics and Gynecology Hospital, Fudan University, Shanghai, China. Of these, 14 women underwent a single blastocyst transfer with subsequent clinical pregnancies identified as multi-chorionic gestations. Thirteen women were in downregulated controlled FET or hormone replacement therapy FET, in which concomitant spontaneous pregnancy could not have been possible. These 13 cases demonstrate monozygotic splitting after the blastocyst stage, which challenges the existing theory that only monozygotic twins can develop after day 3 post-fertilization.

Conclusion

This case series showed that single blastocyst transfer could result DCDA pregnancies during IVF treatment which challenged the accepted theory. Further investigation into the etiology of monozygotic splitting, as well as the effect of IVF techniques on embryonic division, is warranted.