A case report of three live-births and an on-going pregnancy from a single oocyte aspiration and three embryo transfer procedures

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Abstract

We present a case report of a patient that had successful one single fresh and two frozen embryo transfers with three live-births (3 girls) and an on-going pregnancy within a span of 10 years from a single oocyte retrieval, with more frozen embryos (n=16) still available in cryostorage. The fresh embryo transfer cycle was performed in April 2011. A total of 32 oocytes were retrieved. Due to poor sperm morphology ICSI was performed. Of the 32 oocytes, 27 were at metaphase II, 1 was at metaphase 1, 2 at germinal vesicle stages and the remaining 2 were atretic. Following injection of the 27 metaphase II oocytes normal fertilizations occurred in 25 oocytes (92.6%) exhibiting apparently normal 2PNs. All 2PN zygotes cleaved (100% cleavage rates for days 2 and 3). Fresh embryo transfer was performed with 2 embryos (10-cell stages grades 4 and 3-4; range: 4=Excellent,1=poor) on day 3. Of the remaining 23 embryos, 22 embryos graded 4 [excellent] and 3 [good] were vitrified on day 3 using the Medicult (Origio) vitrification kit. One embryo did not meet criteria for cryostorage therefore the embryo frozen-storage rate was 95.6% (22 of 23 day 3 embryos that remained after ET) or 88% (22/25) of fertilized oocytes. For the 2 frozen embryo cycles, 3 embryos were warmed/rehydrated each time, from which 2 embryos survived in each cycle with an embryo survival (67%; 4/6) and viability rates of (50%; 3/6). The frozen ET cycles resulted in a successful twin delivery and a singleton on-going pregnancy. The success rate was 100% for the 1 fresh and 2 frozen ET treatment cycles with an implantation rate of 67% (4/6). This outcome demonstrates the excellent total quality management adhered to and practiced by this IVF facility..

Disclaimer: The authors have no conflicts of interest.
J Reprod Biotechnol Fertil 10:20-21, 2021
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Compliance acknowledgement: This article was edited by the Australian Editorial Services (www.nativeenglisheditor.com)
Keywords: Case report, cryopreservation, live-births, oocyte aspiration, pregnancy, vitrification.

Introduction

Live-birth from embryos after 12 years of cryopreservation has been reported (Revel et al., 2004). However, there has been no report of three successful embryo transfers from a single oocyte aspiration that resulted in 3 live-births, a singleton from fresh cycle and a twin from vitrified embryos, with an ongoing pregnancy 10 year after cryopreservation.

Case Report

We present a case report of a 26-year old female that was treated for infertility in our clinic which has resulted in 3 live-births and an on-going pregnancy over a 10 year period. She was stimulated with r-FSH (Gonal-F) given for 13 days at 150 i.u. per day subsequent to which she was triggered with hCG. A total of 32 oocytes were retrieved in April 2011. Due to poor sperm morphology ICSI was performed. Of the 32 oocytes, 27 were at metaphase II, 1 was at metaphase 1, 2 at germinal vesicle stages and the remaining 2 were atretic. Following injection, the 27 metaphase II oocytes were cultured in Cook IVF medium using the continuous ultra micro-drop (cUMD) culture technic previously

described by Ali et al. (Ali et al., 2000). Normal fertilizations occurred in 25 oocytes (92.6%) exhibiting apparently normal 2PNs. All 2PN zygotes cleaved (100% cleavage rates for days 2 and 3). Fresh embryo transfer was performed with 2 embryos (10-cell stages grades 4 and 3-4; range: 4=Excellent,1=poor) on day 3. Of the remaining 23 embryos, 22 embryos graded 4 [excellent] and 3 [good] were vitrified on day 3 using the Medicult (Origio) vitrification kit. One embryo did not meet criteria for cryostorage therefore the embryo frozen-storage rate was 95.6% (22 of 23 day 3 embryos that remained after ET) or 88% (22/25) of fertilized oocytes. During her follow-up visits she was confirmed pregnant. She proceeded to normal term delivery. She delivered a normal and healthy baby girl.

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On two subsequent visits (in April 2016 and June 2021) her endometrium was prepared for frozen embryo transfers by administration of Estradiol valrate 2mg/day for 5 days, followed by 4mg/day for 5 days, finally 6mg/day for 4 days. On day 12, progesterone was administered (Cyclogest 400mg vaginal pessaries twice per day). ET was performed by standard methods. For the two FET cycles 3 vitrified embryos were warmed/ rehydrated each time, from which 2 embryos survived in each cycle with an embryo survival rate of 67% (4/6). The frozen ET cycles resulted in a twin normal term delivery (2 normal/healthy baby girls and a singleton on-going (June 2021) pregnancy with a vitrified embryo viability rate of (50%; 3/6). The patient still has 16 vitrified day 3 embryos in cold storage which can be used for another 5 more FET treatment cycles but age has caught up with her. It remains to be seen whether she would utilize her remaining cryopreserved embryos.

Discussion

It is quite rare to witness ART treatment cycles that are very efficacious which has been very productive for both the patient and service providers alike. In the present case a single oocyte aspiration that generated 32 oocytes has resulted in 3 live-births and an on-going pregnancy with 16 more cryopreserved embryos still available for the patient's future use. This is a reflection of the outstanding total quality management (TQM) adhered to by all the service providers. The excellent patient management, stimulation, oocyte aspiration, quality of oocytes retrieved, followed by very high fertilizations achieved, the very high proportions of embryos generated, the very efficacious embryo culture conditions, the very high embryo cryopreservation rate, the high embryo survival and viability rates post vitrification and rehydration and the above average skills of the workers that performed the procedures contributed to this very productive outcome. It is also worth noting that the vitrification technique kept the embryos viable in the vitrified state over a period of 10 years. It appears likely the vitrified embryos will remain viable for many years to come in the liquid nitrogen tank. It also appears reasonable to assume the standards of work quality management adhered to in both the laboratory and clinic are of the highest standards. Notably, all the babies born of the treatment cycles were girls. It is too small a number to speculate on the reasons for a predilection towards female offspring but this is intriguing and worth investigating.

This has been an exceptionally fulfilling and gratifying outcome for the patient and the service providers alike. We are not aware of any similar outcome following ART treatment.

References

Ali J, AlNatsha SD, Shahata MAM. Formulation of a protein-free medium for human assisted reproduction. Human Reprod. 2000;15(1): 145-156

Revel A, Safran A, Laufer N, Lewin A, Reubinov BE, Simon A. Twin delivery following 12 years of human embryo cryopreservation: Case report. Human Reproduction. 2004; 19(2): 328-329