

ESHRE AMSTERDAM 2009 Scientific Programme Overview

Selected oral communication session

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Abstract: O-176

Selection of birefringent sperm head under polscope and its effect on outcome of ICSI in azoospermia and complete asthenozoospermia

Introduction: It is still difficult to select competent sperm for intracytoplasmic sperm injection (ICSI). The safety aspect of sperm selection during ICSI, when only immotile spermatozoa are present, remains unexplored to a great extent. It is speculated that, polscopic examination of a sperm with birefringent head and mid-piece (reacted sperm) signifies healthy mature sperm. In the present study, we have investigated whether selection of reacted sperm by polscope, in complete asthenozoospermia and in azoospermia following testicular sperm aspiration (TESA) or extraction (TESE), and injecting them into oocytes having birefringent meiotic spindle (MS) and zona pellucida (ZP) $<20\mu\text{m}$ thick, can improve the pregnancy rate.

Materials & Methods: This study was conducted at the Institute of Reproductive Medicine, Kolkata, India. Approval from the Institutional Ethics Committee was obtained for this study. 69 ICSI cycles were included in this study. All female partners were <37 yrs of age, euthyroid, normogonadotropic and normoprolactinaemic. The study group was divided into Group-A ($n=50$) when male partners included in the study were azoospermic and Group-B ($n=19$) in case of complete asthenozoospermia. Sperm retrieval was performed by testicular sperm extraction (TESE) or testicular sperm aspiration (TESA) in male partners with azoospermia. However, 4 couples were excluded from Group-A as retrieval of sperms was not possible. All women received mid-luteal conventional down regulation with GnRH-a and stimulation with rFSH. Serial follicular monitoring was performed from day-6 of stimulation. Oocytes were retrieved 34-36 hrs following hCG injection and subjected to ICSI. Based on use of polscope, Group-A and B were further divided into groups A1, A2 and B1, B2. In Group-A1 ($n=20$), ICSI was performed by injecting a motile spermatozoa and when no motile sperm was available, spermatozoa with normal morphological appearance was injected into a metaphase-II (M-II) oocyte. Similarly, in Group-B1 ($n=9$), spermatozoa, showing coiling or swelling of tails after modified HOS test, were injected into M-II oocytes by conventional method. In Group-A2 ($n=26$) and Group-B2 ($n=10$) ICSI was performed by injecting a sperm with birefringent head into oocytes showing birefringent meiotic spindle and zona pellucida thickness $<20\mu\text{m}$ under polscopic examination. Day-2 embryo transfer (ET) was performed and luteal support with progesterone initiated on the day of ET. Endometrial thickness and blood flow were satisfactory in all these women. Pronuclear (PN) morphology by Z-score, fertilization rate, embryo grading (Veek's classification), cleavage rate and pregnancy rate were assessed.

Results: The outcome measures were compared between Group-A1, A2 and between Group-B1, B2. The age of the female partners, number of oocytes retrieved, number of M-II oocytes and number of embryos transferred were comparable between the subgroups of Group-A and Group-B. Good quality zygote (Z1,Z2) formation rate (54.93% vs 65.09%; NS) and Grade-I, Grade-II embryo formation rate (52.11% vs 62.26%; NS) were comparable between Group-A1, Group-A2. Pregnancy rate in Group-A2 (46%) though considerably higher than Group-A1 (30%) was not statistically significant. Good morphology (Z1,Z2) zygote formation rate was significantly lower in Group-B1 than in Group-B2 (51.88% vs 76.31%; $P<0.05$). Similarly Grade-I, Grade-II embryo formation was considerably lower in Gr-B1 compared to Gr-B2 (45.57% vs 71.05%; $P<0.05$). Group-B2 yielded significantly higher pregnancy rate in comparison to Group-B1 (50% vs 11.11%; $P<0.05$)

Conclusion: Based on these preliminary observations, it is concluded that selection of reacted spermatozoa prior to microinjection into competent oocyte increases the pregnancy rate in a couple with complete asthenozoospermia and azoospermia to a considerable extent. However, a larger study should be performed to confirm these findings and to establish this easy and simple procedure as a pre-requisite for ICSI, especially in complete asthenozoospermia.