

Comparision of Intracytoplasmic Sperm Injection Outcomes Using Ejaculated Sperm and Retrieved Sperm

Anju Choudhary¹, Dr D S chowdhary², Taruna Chowdhary³

¹ Ph.D. Scholar, Rajasthan University of Health Sciences, Pratap Nagar, Jaipur, Rajasthan 302033, India

² Professor & Head Mahatma Gandhi Medical College and Hospital, Sitapura, Jaipur, Rajasthan, India

³ Ph.D. Scholar, Rajasthan University of Health Sciences, Rajasthan 302033, India

Abstract: *Introduction:* The aim of this object was to compare ICSI outcomes by using ejaculated and retrieved sperms. *Material and Method:* we performed total of 250 IVF-ICSI cycles at Jaipur Fertility center, Jaipur Rajasthan. In 180 participants we used fresh sperm and frozen sperm in the remaining 70 cases. The differences in the outcomes of ICSI using PESA or TESE and ejaculated sperm were evaluated. The main outcome measures were fertilization rate, implantation rate, clinical pregnancy rate (CPR) and live birth rate (LBR). *Results:* No significant differences were seen in fertilization rate, Implantation rate, clinical pregnancy rate and live birth rates with surgically retrieved and ejaculated sperm. Fertilization rate was 73.33% and 70.73% in ejaculated and retrieved sperm respectively. Implantation rate for ejaculated sperm group was 19.95% and 19.40% for retrieved sperms. CPR was 33.80% for ejaculated and 37.14% for retrieved sperm. LBR was 14.07% and 16.55% for ejaculate and retrieved sperms respectively. *Conclusion:* methods of sperms collection (ejaculation and retrieval) may affect the icsi outcomes. ICSI with PESA/TESE is an effective method for azoospermic man.

Keywords: ICSI, in vitro fertilization, ejaculated, retrieved

1. Introduction

Male infertility is a great problem worldwide and there are indications based on reports from fertility treatment registers in several countries that this is on increase. There are many possible reasons for this increase and the most plausible cause could be the increasing exposure to environment factors that are an outcome of unregulated industrialization as well as lifestyle choices. Known causes of male infertility can be sperm production problem or blockage of sperm transport.

Azoospermia, the absence of sperm in ejaculated semen, is the most severe form of male-factor infertility. It affects approximately 5% of all men and accounts for one third of all male-factor infertility cases.⁴ Azoospermia can be either obstructive azoo-spermia (OA) or non-obstructive azoospermia (NOA). In OA, there is a blockage in the transfer pathway of sperm. In all OA and most of NOA cases, sperm can be retrieved from the testis via microTESE.^{9, 10} The aim of this study was to compare ICSI outcomes by using ejaculated and retrieved sperms.

2. Material and Method

We performed total of 250 IVF-ICSI cycles at Jaipur Fertility center, Jaipur Rajasthan. In 180 participants we used fresh sperm and retrieved sperm in the remaining 70 cases. The differences in the outcomes of ICSI using PESA or TESE and ejaculated sperm were evaluated. The main outcome measures were fertilization rate, implantation rate, clinical pregnancy rate (CPR) and live birth rate(LBR).

Ejaculated samples were collected from 180 patients. Patients with a testicular volume almost of 15 mL or greater

underwent diagnostic PESA. If no spermatozoon was found, TESE under the local or general anesthesia was performed. The sample was examined under magnification of $\times 400$ in the microscope for the presence of sperm cells and density gradients were used in all cases to separate spermatozoa and spermatids.

Ovarian stimulation is achieved after using a gonadotrophin releasing hormone antagonist, in association with recombinant human FSH. Ovulation is induced by the administration of 10,000 IU human chorionic gonadotrophin). Ultrasound monitoring done only to measure follicle size and follicle number. When at least three follicles of diameter ≥ 16 mm are observed and with 17β -oestradiol concentrations corresponding to the number of follicles. Transvaginal, ultrasound-guided oocyte retrieval is performed 34–36 h later. On the same day, sperm retrieval was performed by PESA or TESE. After retrieval and preparation of sperms(both ejaculated and retrieved), ICSI was performed on mature eggs. Fertilization was confirmed 24 hours later and embryo transfer was performed on day 3 of ovum pickup. The number of embryos transferred was 2 to 4 per cycle. Only high-quality embryos (grades A and grade B) were transferred.

All the data were entered on Excel sheet M.S. Office Excel-2007 and analyzed statistically using SPSS Statistical software (ver.20) and XL-Stat. All the Outcome variables i.e quantitative data were summarized in the form of Mean \pm SD. In normal distributed data, the difference between mean value of the two groups were analyzed by student's T Test, which were further analyzed by using Mann-Whitney Rank sum test for two groups

3. Results

A total of 250 cases have been studied. Out of which 180 are that of ejaculated sperm (Group A) and 70 are that of retrieved/testicular (Group B) . (Table: 1).

Table 1: Association of Fertilization Rate, Implantation Rate, clinical pregnancy rate (CPR) and Live birth rate with the Ejaculated and Testicular/retrieved spermatozoa

Retrieved / Ejeculated		Fertilization Rate	Implantation Rate	CPR	Live birth rate
Ejaculated	N	180	180	180	180
	Mean	73.33	19.95	33.80	14.07
	SD	21.05	30.24	47.84	24.13
Retrieved	N	70	70	70	70
	Mean	70.73	19.40	37.14	16.55
	SD	23.70	27.54	48.67	23.93
Total	N	250	250	250	250
	Mean	72.60	19.80	34.73	14.77
	SD	21.81	29.45	48.00	24.05
P Value		.399	.93*	.687*	.389*
Significance		NS	NS	NS	NS

* Mann-Whitney Rank sum test

4. Discussion and Conclusion

In our study no significant association of Fertilization Rate (73.33% vs. 70.73), Implantation Rate (19.95 vs. 19.40), clinical pregnancy rate (CPR) (33.80% vs. 37.14%) and Live birth rate was (14.07% vs 16.55%) observed with Ejaculatory or Testicular sperm group respectively. miscarriage was more in ejaculatory group as compared to testicular group (8.38 % vs 2.82%) but no significant difference was observed in present study

Mohammad-Ali Khalili et al (2004)⁷ analyzed that the fertilization rate for the groups whose sperms had been obtained by ejaculation, PESA, and TESE was 72.1%, 73.6%, and 51.3%, respectively. Tahira Naru et al (2008)¹¹ carried out a study on 517 couples and found no significant differences were seen in pregnancy and miscarriage rates with surgically retrieved and ejaculated sperm. The pregnancy rates (including frozen embryo transfer) were 43.5%, 36.2%, and 41.4% in couples with PESA, TESE, and ejaculated sperm, respectively ($P = .93$). The miscarriage rates were 16.7%, 23.5%, and 12.1%, respectively ($P = .37$). Amrijannati et al (2012)¹ performed nineteen ICSI cycles performed with testicular spermatozoa and the rest of cycles (n = 208) carried out with ejaculated spermatozoa. Result analysis showed similar fertilization rate between testicular and ejaculated spermatozoa (respectively, 60% versus 68%, $P \geq 0.05$). Jamal W et al (2012)⁵ found that there were no significant differences in fertilization rate or cleavage rate between the ejaculated and the surgically retrieved groups. Goker EN et al (2002)³ concluded that the fertilizing ability of sperm in ICSI is highest with ejaculated sperm and lowest with sperm extracted by testicular biopsy. Also, the clinical PRs are significantly lower in ICSI with sperm from testicular biopsy. However, the outcomes of pregnancies are not affected by using surgically retrieved sperm from ejaculated semen. Ben-Ami I et al (2013)² found there were no significant differences in fertilization rates between the two subgroups. A comparison between testicular sperm

extraction (TESE) versus ejaculated sperm cycles revealed significantly higher implantation rate (20.7% vs 5.7%), higher PR (42.5% vs 15.1%), and higher take home baby rate (27.5% vs 9.4%).Negri L et al (2014)⁸ found that in cases of persistent necrozoospermia, testicular sperm should be favoured over ejaculated sperm. Karacan M et al (2013)⁶ found that the outcomes of patients with nonobstructive azoospermia did not differ from those of patients with obstructive azoospermia within and among the groups. Jamal W et al (2012)⁵, Karacan M et al (2013)⁶, Amrijannati et al (2012)¹, Tahira Naru et al (2008)¹¹ found no significant difference in ICSI outcomes with testicular and ejaculated spermatozoa. Which matched to our study.

No significant differences were seen in fertilization rate, Implantation rate, clinical pregnancy rate and live birth rates with surgically retrieved and ejaculated sperm. Fertilization rate was 73.33% and 70.73% in ejaculated and retrieved sperm respectively. Implantation rate for ejaculated sperm group was 19.95% and 19.40% for retrieved sperms. CPR was 33.80% for ejaculated and 37.14% for retrieved sperm.LBR was 14.07% and 16.55% for ejaculated and retrieved sperms respectively.

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Author Profile

Anju Choudhary, Ph.D. Scholar, Rajasthan University of Health Sciences, Pratap Nagar, Jaipur, Rajasthan 302033, India. Presently working as demonstrator in Department of Anatomy, Mahatma Gandhi Medical College Jaipur Rajasthan

