Journal of Natural Sciences Research www.iiste.org
ISSN 2224-3186 (Paper) ISSN 2225-0921 (Online)
Vol.2, No.3, 2012

ICSI Cycle with a Sperm from TESE versus From Ejaculate in Oligospermic Men

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Abstract
Objective: The aim of our study to compare the quality of embryos and fertilization rates in (ICSI) cycles using sperm from ejaculates of (oligospermic), and sperm of azospermic patients using (TESE).
Methods and Subject: Retrospective study, conducted (the IVF Unit) at KAUH, all male patients under went ICSI cycle from June 2011 until January 2012. Total number of ICSI cycle was 184 but only 53 male (27 with azospermia sperm obtained by TESE and 26 with oligospermia) were eligible for analysis by using inclusion and exclusion criteria. The medical record of the wives of male patients reviewed and information was obtained from the file . Number of Oocyte, and number of embryos transfer and quality of embryo recorded. Main Outcome Measure Quality of Embryo, Fertilization rates.
Result(s): 184 ICSI only 53 were eligible for analysis, divided into two group according to the orgain of the sperm Group 1 (27) had TESE and Group 2 (26) gave sperm by masturbation but their semen parameters count $\leq 5\times10^6$/ml and ≤10% progressive motility. When compare the number of the embryo with the quality of grade (from 1 to 4) in both groups we found , the frequency of good quality embryo grade 1,2, were more in the oligospermic group than TESE and that was statistically significant with P value 0.001.
Conclusion: The fertilization rates are not affected by the source of the sperm but the quality of embryos are Better with sperm retrieved from the ejaculate when compare with sperm from TESE.
Key Words: ICSI, Azospermia, TESE

Introduction:
Male with azospermia used to be tagged as a" sterile " until 1985 when first pregnancy achieved using assisted reproductive techniques following epididymal sperm aspiration in a man who had previously undergone a vasectomy. Severely oligospermic male with sperm count (<5 × 106/mL) significantly reduced chance of fertilization. Male factor fertility improved dramatically by introduction of Intracytoplasmic sperm injection (ICSI) when the first pregnancies and live births reported in 1992. Testicular failure affects approximately 1% of the male population. Today the recognized indications for treatment by ICSI include severe deficits in semen quality, obstructive azospermia, non-obstructive azospermia and it should be considered for couples in whom a previous in vitro fertilization treatment cycle has resulted in failed or very poor fertilization.[1]
The aim of our study to compare the Quality of embryos and fertilization rates in Intracytoplasmic sperm injection (ICSI) cycles using sperm from ejaculates of abnormal semen (oligospermic), and sperm of obstructive and non-obstructive azospermia patients using (TESE).
Methods and Subjects:
The study is a Retrospective study, conducted in the IVF Unit at King Abdulaziz University Hospital, Jeddah, Kingdom of Saudi Arabia, all male patients under went ICSI cycle from June 2011 until January 2012. Total number of ICSI cycle was 184 but only 53 male (27 with azospermia sperm obtained by TESE 26 with oligospermia) were eligible for analysis. The study was approved by the ethical committee; there were no conflicts of interest.
Inclusion criteria all ICSI cycle done for male with semen parameters count ≤5×106/ml and ≤ 10% progressive motility or with azospermia, sperm obtained by TESE. Exclusion criteria if done for male had more than 5×106/ml and more than 10% progressive motility. Azospermia no sperm could be obtained by TESE or if ICSI done for other induction.
The medical record of the wives of male patients reviewed and information was obtained from the file was age, weight, height, wither it is a primary or secondary infertility, hormonal profile including (TSH, FSH, LH, and PROLACTIN. The ESTRDIOL level before the HCG was measured; number of Oocyte, and number of embryos transfer and quality of embryo was recorded. Intervention(s): ICSI, testicular biopsy. Main Outcome Measure(s): Quality of Embryo and Fertilization rates.
For the last few years, we adopted GnRH antagonist protocol for ovarian stimulation and it was used for all our patients "Gonal F (150–225 IU/day) with GnRH antagonist 0.25 IU subcutaneous form day 6. Monitoring using serum oestradiol concentrations and ultrasound examination, ovulation was triggered using 10000 IU human

chorionic gonadotrophin (HCG) "Oocyte retrieval was performed 36 h after HCG administration under transvaginal ultrasound-guided puncture of the follicles, then ICSI procedure was done in the usual fashion.
Fertilization was considered normal when two clearly distinct pronuclei were present. Further embryonic development was assessed 24 h later. The embryos were classified according to the following morphological criteria.
The four level grading system for multi-cell embryos is evaluated in the following way[2]:
•Grade 1: even cell division, little to no visible fragmentation
•Grade 2: even cell division, small fragmentation (less than 20%)
•Grade 3: uneven cell division, moderate fragmentation (more than 30%)
•Grade 4: uneven cell division, excessive fragmentation (more than 50%)
According to the number of good morphological quality embryos and the age of the patient, up to three embryos (in most instances only two) were replaced into the uterine cavity approximately 70 h after the micro-injection procedures.

Statistical Analysis:

Data entry and analyses were undertaken using the computer software Statistical Package for Social Sciences 15 (SPSS Inc., Chicago, IL.,USA) version 2006. The quality of the entry process was checked by reentering a random sample of 10% of the cases, and running frequencies to check for extreme values. In the analysis, appropriate frequencies were generated. The variables were analyzed using the Chi-square test, independent sample T test. And p-values of less than 0.05 were considered significant.

Results:

The Number of ICSI were 184 cases only 53 were eligible for our analysis, The 53 male who have ICSI Cycle was divided into two group according to the orgain of the sperm group 1 had TESE and Group 2 gave sperm by masturbation but their semen parameters count ≤5×106/ml and ≤10% progressive motility.
When we compare the age in years, weight in kg and height in cm in the two groups there were no statistically significant difference (Table 1).
(Table2) showing the Comparison between the two groups in term of hormonal profile, TSH, FSH, LH, Prolactin and Estradiol, there were No statistically significant deference.
(Table 3) showing the mean number of Oocyte retrieved and the mean number of embryos transferred and there were no statistically significant difference in both groups. There was nosignificant difference in the fertilization rates amoung two groups.
The total number of embryos was 83, the number of embryo transferred were 1 to 2 embryos per patients. When we compare the number of the embryo with respect of the quality of grade (from 1 to 4) in both groups we found that, the frequency of good quality embryo grade 1,2, were more in the oligospermic group than TESE and that was statistically significant with P value 0.001. Table 4 showing the grade of embryo in each group.

Discussion:

Does the source of the sperm affect the fertilization rate and the quality of the embryo? There are some data to support that the sperm from testis or epididymal have decreased fertilities potential after ICSI[3]. But also indicate that the sperm quality is important and this would affect the fertilization rate, embryo development and pregnancy rate. If good quality sperm is used and embryo transfer with high quality the viability of ICSI embryos is nearly equal regardless of the source of sperm used.[3] In our study the fertilization rate was the same regardless of the source of the sperm.
Several publication emphasis that the source of sperm in cases of ICSI has nothing to do with embryo development and pregnancy rate but sperm defect that what affect the fertilization rate embryo development and pregnancy rates. With significantly lower when testicular spermatozoa from TESE are used because the sperm usually are more defective.[4]
One study show that Testicular spermatozoa recovered from patients with obstructive and all types of non-obstructive azospermia were as much as effective as ejaculated spermatozoa in ICSI cycle.[5]
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.[6]
Intracytoplasmic sperm injection in combination with PESA and TESE is an effective method and can successfully be performed to treat men with azospermia. The outcomes with these procedures are comparable to ICSI using ejaculated sperm.[7]

It has been shown that paternal factors and/or performing ICSI in cases of severe male factor infertility may have a detrimental effect on blastocyst development and their quality.[8] In our study we found the quality of embryo were better if the sperm taken from ejaculate of oligospermic male than from TESE.

Conclusion:

The fertilization rate are not affected by the source of the sperm but the quality of embryo are better with sperm retrieved from the ejaculate when compare with sperm from TESE. This study has limitation due to small number and Larger study would be necessary to find a definitive answer as to whether sperm source affect the quality of embryo which affect the fertilization rate and subsequently pregnancy rate.

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Table 1

Comparison of Age, Weight And Height Between The Two Groups

	N	Mean	Std. Deviation	P
Age years				
1=TESA	26	32.77	5.24	0.9
2=OLIGOS	25	33.32	5.21	
Weight kg				
1=TESA	27	73.00	13.24	0.2
2=OLIGOS	26	71.57	17.24	
Height cm				
1=TESA	27	157.63	5.05	0.3
2=OLIGOS	26	159.46	6.35	

TESA = Testicular Sperm Extraction
OLIGOS = Oligospermia

Table 2

The Mean of Hormone Level In The Two Groups

	N	Mean	Std. Deviation	P
TSH				
1=TESA	12	2.73	1.48	0.539
2=OLIGOS	22	2.12	1.31	
FSH				
1=TESA	19	5.11	1.65	0.040
2=OLIGOS	21	6.10	4.88	
LH				
1=TESA	19	7.79	6.51	0.363
2=OLIGOS	21	9.44	11.25	
Estradiol				
1=TESA	24	4727.13	2182.28	0.773
2=OLIGOS	23	4433.22	2232.85	
Prolactin				
1=TESA	16	371.88	178.50	0.127
2=OLIGOS	22	430.53	280.09	

TSH = Thyroid stimulation hormone
FSH = Follicular stimulation hormone
LH = Luteinizing hormone

Table 3

The Mean of Number of the Oocyte and Embryos Transfer and the Fertilization Rate

	N	Mean	Std. Deviation	P
Oocyte				
1=TESA	27	3.19	2.79	0.207
2=OLIGOS	26	4.42	2.44	
ET				
1=TESA	27	1.22	1.39	0.557
2=OLIGOS	26	2.04	1.34	
F.Rate				
1=TESA	27	27.0	31.54	0.167
2=OLIGOS	26	41.0	25.55	

N = Number of Cycle
Mean = Mean of Total Number of Oocyte Retrieved from Right Ovary
Mean = Mean of Embryo Transfer
ET = Embryo Transfer
F.Rate = Fertilization Rate

Table 4

Comparison of the frequency of grades of embryo transferred between the two groups

Quality (1 - 4)	N	No Embryo	1 Embryo	2 Embryo	P
Grade 1					
1=TESA	27	22	5	0	0.001
2=OLIGOS	26	5	19	2	
Grade 2					
1=TESA	27	18	8	1	0.02
2=OLIGOS	26	9	14	3	
Grade 3					
1=TESA	27	16	11	0	0.04
2=OLIGOS	26	17	9	0	
Grade 4					
1=TESA	27	20	7	0	0.02
2=OLIGOS	26	25	1	0