



Number Of Moving Sperm Is the Better Predictor for Intrauterine Insemination (IUI) Pregnancy Rates

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Introduction

Intrauterine insemination (IUI) is a method that has been used for many years in the treatment of infertile couples. IUI is the first referenced assisted reproductive technique in mild to moderate male infertility. IUI is non-invasive, very simple and less expensive than classical in vitro fertilization and intracytoplasmic sperm injection (ICSI). IUI success depends on many factors such as drugs, the timing and number of cycles and total motile sperm count after washing. Another important factor affecting the success of IUI is the number of motile sperm inserted into the uterus (1). Most studies have suggested that the success of IUI, and therefore pregnancy rates, decrease if there is not a sufficient number of motile sperm after washing (2–5). Semen analysis is the first step to accurately diagnose male infertility. Sperm count, sperm motility and the percentage of sperm with normal morphology are the main criteria for the quality of semen. When determining sperm quality, the values established by the World Health Organization (WHO) 2010 are often used (6). Intrauterine insemination is generally attempted before proceeding to more expensive and invasive assisted-reproductive techniques such as intracytoplasmic sperm injection. Several semen parameters have been shown to correlate with IUI outcome and may be useful when counselling couples. Our aim was to determine the impact of processed total motile sperm (PTMS) count on pregnancy after intrauterine insemination.

Methods

Hospital based retrospective study of patients who underwent IUI. The clinical and semen parameters were recorded for each couple and each insemination. The parameters were compared between those couples who achieved a pregnancy and those who did not. This retrospective study included a total of 345 cycles and was performed in our centre over a 4 month period (Jan 2015 to April 2015). These couples were candidates for IUI because of mild male factor infertility or unexplained infertility.

All the IUI cycles underwent controlled ovarian stimulation with clomiphene and gonadotrophins. The stimulation treatment was started on the second day of the cycle and was continued until ovulation. Vaginal ultrasonography was performed to assess the size and number of follicles and endometrial maturation. This evaluation was begun on the seventh day and the evaluation was repeated after two or three days, depending on follicular development. A single dose of recombinant hCG (10000 IU) was given when the mean diameter of the leading follicle reached ≥ 18 mm. Insemination was performed 36 hours after the hCG injection. The husband was instructed to abstain from sexual intercourse for 3–5 days before insemination. Semen samples were obtained by masturbation in sterile plastic containers. After liquefaction of the semen (about 30 minutes at room temperature), the initial

semen volume, sperm count and progressive motility were evaluated according to WHO criteria. Semen samples were processed using swim up technique. All procedures were conducted under sterile conditions. Media were brought to 37°C. Using a sterile pipette, 1 mL of semen sample was transferred into a conical centrifuge tube. Using a new sterile pipette, 1 mL of preincubated semen preparation medium (Hepes plus, Vitromed ,Germany) was gently mixed with semen sample and centrifuged for 10 minutes at 1500 rpm(balanced centrifugation done with a tube filled with same volume of water). The supernatant was carefully aspirated without disturbing the pellet.1 ml of semen preparation medium was gently dispensed on the top of the pellet. The tube was then incubated at an angle of 45° for 30–40 minutes in the CO2 incubator. After the incubation period, the entire supernatant was transferred into a tube discarding the pellet. IUI was performed using a catheter (IUI device,Shreyas health care,Puducherry) through the cervix and injecting washed sperm directly into the uterus. Total motile sperm count and post-wash motile sperm count were calculated by the formula (volume × motile sperm count × motility).

Statistical analysis of the data was done using SPSS software (version 16, SPSS, Chicago, USA). The data were analyzed using the independent t-test and the x2 test. Significance was set at $p < 0.05$.

Results

Among 345 patients who underwent IUI, the total number of pregnancies was 29, resulting in a pregnancy rate per cycle of 8.4%. Mean age of patients who conceived was 27.69 yrs, Mean FSH was 4.765 and mean LH was 4.827. The pregnancy rate was significantly higher in patients with post-wash total motile sperm count of $>10 \times 10^6$ with P value of 0.057. The number of follicles developed and endometrial thickness does not have any statistical significance associated with pregnancy rates P-0.102 and P-0.890 respectively. On multivariable logistic regression analysis, the PTMS count was independently associated with fertility after IUI (P = 0.028). An average post-wash total motile sperm count of 10×10^6 may be a useful threshold value for IUI success.

PREGNANCY		POSITIVE	NEGATIVE	P VALUE
MEAN AGE		27.69	28.44	
FSH		4.766	5.381	
LH		3.85	4.827	
AFC	POOR RESPONDER(2-3)	2	30	
	AVERAGE RESPONDER(5-9)	16	204	
	PCO(>10)	11	82	0.373
TMC	<10 million	2	69	
	>10 million	27	247	0.057
FOLLICLE	=1	11	170	
	>1	18	146	0.102
ET	<7mm	6	62	
	>7mm	23	254	0.89
TOTAL		29	316	

Table 1: Pregnancy Rate Comparison With Patient Variable, Total Motile Counts, Number Of Follicle And Endometrial Thickness

	ODDS RATIO	P VALUE	95% C.I.for EXP(B)	
AGE	0.965	0.431	0.882	1.055
AFC	0.064	0.305	0.277	1.494
FSH	0.947	0.434	0.827	1.085
LH	0.998	0.91	0.971	1.027
TMC	1.049	0.028	1.005	1.094
NUMBER OF FOLLICLE	1.453	0.087	0.947	2.227
ENDOMETRIAL THICKNESS	0.975	0.96	0.364	2.612

Table 2: Multivariate Logistic Regression Showing Independent Association of Ptms on Pregnancy Rates

Conclusion

Our study demonstrated that post-wash total motile sperm count can provide valuable decision making information to couples deciding between IUI and IVF treatment .In conclusion, post wash semen quality was the most important factor for prediction of successful pregnancy in this study. post washed total motile sperm count used for IUI may be considered predictive of the success for pregnancy and allow couples to be informed of the chances of success.

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