IMPORTANCE OF SPERM SURVIVAL IN INTRA UTERINE INSEMINATION PROGRAM

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SUMMARY

Survival of sperms for a minimum period of 18 hours in the female genital tract is a necessary requisite to ensure fertilization of the oocyte. Presence of viable actively motile sperms in the uterus throughout the expected time of follicle rupture and oocyte release maximises the chances of a successful fertilization and pregnancy. This can be ensured during the IUI procedures by doing in-vitro sperm survival test and deciding the insemination timings based on the survival time of the sperms.

INTRODUCTION

Intra Uterine Insemination (IUI) is a very useful and cost effective treatment in cases of infertility, especially male factor infertility. The IUI procedure is preceded by a sperm wash technique which helps in selecting the very best sperms which can be made available for fertilizing the ovum.

Along with the sperm count, motility and morphology the sperm survival also plays a distinctive role in predicting the fertilizing potential of the sperms (Fuse 1990). It has been found that only those sperms which can survive for more than 18 hours are capable of fertilizing the oocyte. Hence the sperm's ability to survive for a specified minimum time period is an important factor to be considered in cases of male infertility.

Our aim was to study the sperm survival in cases of unexplained infertility and to find a possible correlation between motility, count and survival.

MATERIALS AND METHODS

The study was carried out at the

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Manipal Assisted Reproduction Center, Kasturba Hospital, Manipal. 246 couples reported for IUI treatment over a period of six months, out of which 79 were cases of unexplained infertility and these were recruited for this study.

Semen was collected by masturbation in sterile containers and routine analysis was performed. Count was detected using Makler chamber (Sefi Medical Instruments, Israel). Motility and morphology were analysed according to the WHO Laboratory manual (1992). The semen was divided into two centrifuge tubes (Falcon) and processed for swim up. In brief, the specimen was centrifuged twice at 300Xg for 10 minutes with the culture medium [Nutrient Medium F-10 Ham (Gibco)] supplemented with 10% bovine serum albumin (Sigma Chemical) Co. USA), the pellet was then overlayed with 0.5mL of the medium and incubated for 1 hour at 37°C in 5% CO_2. The supernatant from both the tubes was pooled and assessed again for count, motility and morphology 0.5mL was incubated further and assessed again for motility at 20-24 hrs.

The survival rate was calculated as ratio of the total forward progressive sperms at 24 hours x 100 to initial number of forward progressive sperms. The sperm survival test was rated as good when this ratio was 50% or more.

RESULTS

Of the 79 specimens included in this study, good survival was reported in 26 cases (32.91%), the survival was poor in 19 cases (24.05%) and in 34 cases (43.03%) the sperms did not survive for more than 18 hours. No significant difference was seen regarding the sperm count and/or motility between the different groups on statistical analysis (One Way ANOVA and Multiple Range Test, Scheffe Procedure).

There were seven reported pregnancies (8.86%) from the couples where the sperm survival capacity was good and none in the other two groups. (Table)

DISCUSSION

Sperm survival test has been used in the prediction of the fertilizing capacity of the sperm in vitro (Franco et al 1993,

	Good survival (n=26)	Poor survival (n=19)	No survival (n=34)
Mean count (millions/mL)	56.038+/6.33	60.526+/-6.509	49.706+/-4.95
Mean motility	72.192+/-1.868	74.52+/-3.14	65.91+/-1.73
Pregnancy (n)	7	nil	nil

Comparison of count and motility in the three survival groups (values given are mean +/- SEM)

fuse M. 1990). This test also provides a simpler and invaluable alternative to mouse embryo culture for quality control testing of different batches of culture media and of various disposable products used in tissue culture and IVF (Critchlow et al 1989).

In this study conducted in our laboratory our intention was to explain the relevance of this test in IUI procedures.

In the Intra Uterine Insemination procedure, washed sperms was inseminated approximately at the time of follicle rupture and oocyte release. The presence of healthy actively motile sperms in the uterus at the time of ovulation is very crucial in order to maximise the chances of fertilization. Since in our clinic IUI is done twice, 24 hours before and after follicle rupture (detected by ultrasonography), it is very much essential that the sperms survive for a long time period.

Where the survival is not good, insemination can be done twice in a day (once in the morning and in the afternoon) so as to ensure the presence of live sperms in the vicinity when the oocyte is released.

Though in the above study survival was not found to be related in any way to sperm count and motility, it may be related to some other sperm functions like capacitation and acrosome reaction. Antisperm antibodies in sera and seminal plasma have been known to influence sperm motility and survival (Daya & Clark 1992, Matthur et al 1988).

A thorough analysis taking all these sperm functions into consideration along with sperm survival test may prove to be an accurate clinical test for predicting the sperm fertilizing potential and the fertilization rate in vivo and in vitro.

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