

Do the Wives of Oligospermic Husbands have Lesser Chances to Conceive After Donor Insemination Compared to Azoospermic Husbands ?

Himanshu Roy, Sharika Roy, Namita

Srijan Centre for Assisted Human Reproduction, Vidyapuri, Kantkarbagh, Patna 800 020.

Summary

Aims : This study was done to find out whether the probability of conception after donor insemination is compromised in couples having oligozoospermic husbands as compared to that in azoospermic husbands.

Material & Methods : This study is a retrospective analysis of 353 cases who were accepted for donor insemination programme at Srijan, Centre for Assisted Human Reproduction, Patna during the period of Dec., 1997 to May, 2000. Cramer's life table analysis was used to calculate the pregnancy rates. Chi square test, Wilcoxon's test and Fisher's exact test were used to test the difference between various groups.

Result : I.U.I. with cryopreserved donor semen was done in 353 women during the study period. A total of 764 cycles were performed which resulted in 69 USC confirmed pregnancies. On doing the Life Table Analysis in the women with azoospermic husbands the cumulative probability of conception after six months of treatment was 43% while in the women with oligozoospermic husbands it was 73%.

Conclusion : The pregnancy rate with intrauterine insemination using frozen donor semen in couples having oligoasthenozoospermic husband is not compromised compared to azoospermic husband.

Introduction

Artificial Insemination by donor semen is being used less frequently in Western countries with the advent of ICSI & related procedures. However, in places where these technologies have not reached or are not affordable, A.I.D. (Artificial Insemination by Donor semen) has important role to play in cases of male subfertility. Since the procedure entails a lot of moral issue for the patient, the couple who finally accepts this modality of treatment wants to know the prognosis of this procedure.

Various factors have been implicated for the success of this procedure. Most important one being the age of the patient, duration of infertility, additional female factors and the characteristic of donor sperm sample being used. Husband's seminal status seems to **have no** role once the donor insemination procedure is **embarked** upon. Many studies have been done in the past to see whether the husband's seminal status has any effect on

the success rate of donor insemination. Majority of these studies have shown that success rate is higher among the wives of azoospermic husband compared to wives of oligospermic husbands where A.I. is undertaken (Barratt et al, 1990).

This study was done to find out whether the probability of conception after donor insemination is compromised in couples having oligozoospermic husbands as compared to that in those having azoospermic husbands.

Material & Methods

This study is a retrospective analysis of 353 cases that were accepted for donor insemination programme at Srijan, Centre for Assisted Human Reproduction, Patna during the period of December 1997 to May 2000.

The husbands of women who came for donor

Table - I
Summary Statistics

	Azoospermia	Oligo-Astheno Zoospermia	Normal	Total
Number of patients	283	51	19	353
Number of cycles	616	105	43	764
Number of pregnancies	55	13	1	69
Pregnancy Rate / Cycle (%)	8.92	12.38	2.32	9.03

insemination were classified into azoospermic, oligoasthenozoospermic and normal according to WHO guidelines (1999). Stimulation was done with clomiphene citrate 50-150 mg/day from the 2nd to the 6th day of the cycle. USG for follicular monitoring was started from 10th day of the cycle. When the dominant follicle reached 18-24mm in diameter 5,000 I.U. of H.C.G. was given. Intrauterine insemination was done only once, 36 hours after the H.C.G. injection. Cryopreserved washed donor semen was used after matching with husband's blood group and checking the motile count to be over 5 million/ml. I.U.I. was done in lithotomy position using 0.5ml of thawed semen. Luteal support was given only in selected cases. Criteria for selection of cases for Luteal support was presence of any one or more of the following :-

1. Age more than 35 years
2. Thin endometrium < 7mm
3. History of early abortion
4. Bleeding during the insemination procedure

Ampicillin was given as a prophylactic. The pregnancy was confirmed with serum β -HCG done on the 14th postinsemination day and further confirmed with transvaginal sonography 10 days later.

The characteristics of women were evaluated to find any difference between those with azoospermic and oligospermic husbands which might influence the success rate. The pregnancy rate per cycle and cumulative pregnancy rate at the end of 6 cycles was calculated and compared between the two groups of women. Statistical analysis was done using the Data analysis programme of Excel '97 (Microsoft corp., U.S.) and with Medcal-C (Internet Demo-version). Cramer's (1979) life table analysis was used to calculate the pregnancy rates. Chi-squares test, Wilcoxon's test and Fisher's exact test were used to test the difference between various groups.

Result

I.U.I. with cryopreserved donor semen was done in 353 women during the study period. A total of 764 cycles were performed which resulted in 69 USG confirmed pregnancies (Table - I).

In 80.2% (n=2983) the husband was azoospermic, in 14.4% (n=51) oligoasthenozoospermic and in 5.4% (n=19) normozoospermic. The number of

Table - II
Characteristics of Women According to husband's seminal Fluid Analysis

	Azoospermia	Oligo-Astheno- Zoospermia	p-value	Normal	Total
Mean Age (Yrs.)	27.93 (+0.27)	30.09 (\pm 0.72)	0.003	29.68 (\pm 1.28)	28.34 (+0.25)
Mean Duration of Infertility (In Yrs.)	9.23 (+0.29)	10.88 (\pm 0.7)	0.03	10.05 (+0.96)	9.51 (+0.26)
Mean Number Of Cycles Patient	2.17 (+0.29)	2.05 (+0.19)	0.59	2.26 (+0.45)	2.16 (+0.08)
Pregnancy Rate / Cycle %	8.92	12.38	0.47	2.32	9.03

IUI cycles performed in these women were 616,105 and 43 respectively while the resultant pregnancies were 55,13 and 1 (Table I).

The mean age of the female partner was 27.93 (S.F.M. \pm -0.27) years in azoospermic, 30.09 (\pm -0.72) years in oligoasthenozoospermic and 29.68 (\pm -1.28) years in normozoospermic husband. The mean duration of infertility in these women was 9.23 (\pm -0.96), 10.88 (\pm -0.7) and 10.05 (\pm -0.96) years respectively. The difference in mean age of women having azoospermic husband and oligozoospermic husband was 2.16 years (p = 0.003). The wives of oligozoospermic husbands were significantly older than those of azoospermic husbands (Table III).

The mean duration of infertility was also 1.65 years more in the wives of oligozoospermic husbands and this difference was significant (p = 0.03) (Table II). The mean number of IUI cycles done in these two groups was not significantly different. In both the groups more than two thirds of conceptions took place in first two cycles. (Table II). The uncorrected pregnancy rate per cycle was 8.92%, 12.38% and 2.32% in couples with azoospermic, oligozoospermic and normozoospermic husbands respectively. Thus, pregnancy rate per cycle was 4.26% higher in the couple having oligozoospermic male partner than in the couple with azoospermic male partner, but this difference was not significant (p = 0.47) (Table II). Fisher's exact test showed a p -value of 0.27 regarding the difference in Pregnancy Rate/Cycle between the two groups.

On doing the life table analysis in the women with azoospermic husbands it was found that the probability of conception per month for donor insemination was 12.52% for the first cycle of treatment, 10.15% for the second, 9.44% for the third, 14.28% for the fourth, 5.88% for the fifth and 0% for the sixth cycle. The cumulative probability of conception after six months of treatment was 43%. (Table III).

Table - III
Life Table Analysis of Pregnancy Rate in wives of Azoospermic Husbands

Cycle No.	No. of Patients	No. of Pregnancies	Lost To Follow-up	Probability Of Conception/ month	Cumulative Probability of Conception
1	283	30	87	12.52	12.52
2	166	13	76	10.15	21
3	77	6	27	9.44	29
4	44	5	18	14.28	39
5	21	1	8	5.88	43
6	12	0	6	0	43

On doing the life table analysis in women with oligozoospermic husbands it was found that the probability of conception per month for donor insemination was 9.63% for the first cycle of treatment, 21.27% for the second, 19.04% for the third, 20% for the fourth, 0% for the fifth and 43% for the sixth cycle. The cumulative probability of conception after six months of treatment was 73% (Table IV). In women having oligozoospermic husbands the cumulative probability of conception was higher from the second to the sixth cycle of treatment than couples having azoospermic male partner. (Figure 1). The paired Wilcoxon's test indicates insignificant difference in probability of conception per month between these two groups of women. (P = 0.2). The Odds Ratio for achieving pregnancy was 0.69 for azoospermic couples compared to oligospermic couples. The O.R. was higher in both these groups compared to couples with male partner having normal semen analysis. Anyhow, the 95% Confidence Interval included the value of 1 in all the three scenarios, so these findings were not significant (Table V).

If we study the women who conceived after donor insemination, the mean age and mean duration of infertility was higher in the group of women having oligozoospermic husbands compared to women with azoospermic husbands (Table VI) while the number of cycles taken to conceive was also higher in the former group but these differences were not significant (Fig. 1).

Discussion

Very few studies have been done on the relationship of wife's age to husband's seminal status in cases of donor insemination. In our study, both the mean age of the woman and the duration of infertility were significantly higher in oligoasthenozoospermic compared to azoospermic group. This is because when the male partner has even a low count of spermatozoa, there is a delay in presentation for donor insemination until other therapies are tried to improve the count or to

Table IV
Life Table Analysis of Pregnancy Rate in wives of Oligo-asthenozoospermic Husbands

Cycle No.	No. of Patients	No. of Pregnancies	Lost to Follow-up	Probability of Conception/month	Cumulative Probability of Conception
1	51	4	19	9.63	9.63
2	28	5	9	21.27	29
3	14	2	7	19.04	42
4	5	1	0	20	54
5	4	0	1	0	54
6	3	1	1	40	73

Table - V
Odds Ratio for achieving pregnancy between various group of women according to male partners' seminal status

	Odd Ratio	95% Confidence Interval
Azoo:Oligo	0.69	0.36 - 1.32
Azoo:Normal	4.11	0.55 - 30.49
Oligo:Normal	5.93	0.75 - 46.86

Table - VI
Comparison of Characteristics of Women who conceived according to husband's seminal status

	Azoospermia	Oligoastheno Zoospermia	Difference	P-Value
No. of Women	55	13		
Total Cycles	99	30		
Mean Age (Yrs.)	26.36 (± 0.48)	27.84 (± 0.99)	1.48	0.18
Mean Duration of Infertility (Yrs.)	8.7 (± 0.55)	8.69 (± 0.89)	0.01	0.99
Mean No. of Cycles Per Woman	1.8	2.3	0.5	0.16

achieve pregnancy. Here, couples often resort to traditional forms of medicine when the response to conventional system is unsatisfactory. Amuzu & Sunder (1993) reported that in patients who conceived, the mean age of female partner was 28.8 years in azoospermic and 30.2 yrs in oligospermic. The mean age of women in our study who conceived was 26.36 years in azoospermic group and 27.84 years in oligozoospermic group but these differences were not significant (Table - VI).

Albrecht et al (1982) found a higher success rate of donor insemination per cycle in azoospermic as compared to couples having oligospermic male partner

(205 vs 10%). Similar observations were made by Byrd et al (1990), Emperaire et al (1982), Edvinsson et al (1990), Shenfield et al (1993), Amuzu Sander (1993) and Lannou et al (1995). Various explanations have been given to explain this difference in conception rate between the two groups:

1. Women having oligozoospermic husband who come for donor insemination represent a group having low fertility because the highly fertile among them have already conceived even with low sperm count in husband and thus do not need donor insemination.

2. Possible negative influence imposed by subfertile male partner through the seminal fluid.
3. Usually the age and duration of infertility is higher in oligozoospermic couple before they agree for donor insemination as compared to azoospermic couples who accept this treatment earlier.

In an interesting study by Cramer et al (1982) it was found that as the sperm concentration increases in husband the conception rate with donor insemination decreases in the wife.

In our study, the conception rate was higher in oligoasthenozoospermic group than in azoospermic group though the difference was not statistically significant. This finding is interesting when we consider the older age and longer duration of infertility in oligozoospermic couples knowing the negative effect of these factors on fertility. Thus, the hypothesis that wives of oligozoospermic husbands who come for donor insemination represent a group of women having compromised fertility does not hold true according to our study and these patients have equal if not better chances of conception with I.U.I. using cryopreserved donor semen compared to wives of azoospermic husbands.

The assumption that there may be immunomodulating or other inhibiting substance in the seminal fluid of oligozoospermic husbands can hold true for azoospermic also until proven otherwise.

Conclusion

It is concluded that intrauterine insemination with cryopreserved donor semen is a feasible option as a treatment for male infertility where the husband has oligoasthenozoospermia and when other treatments fail to achieve conception within a reasonable period of time. These couples do not carry a worse prognosis compared to couples having azoospermic male partners.

References

1. Albrecht BH, Cramer D, Schiff I, *Fertility & Sterility*, 37;792; 1982
2. Amuzu BJ, Sander S S, *Obstetrics & Gynaecology*, 82; 128; 1993
3. Barratt CLR, Chauhan M, Cooke ID, *Fertility & Sterility* 54;375; 1990
4. Byrd W, Bradshaw K, Carr B, Edman C, Odom J, QAckerman G, *Fertility & Sterility*, 53;521;1990
5. Cramer DW, Walker AM, Schiff I, *Fertility & Sterility*, 32;80;1979
6. Edvinsson A, Forssman L, Milsom I, Nordfors G, *Fertility & Sterility*; 53;81; 1990
7. Emperaire JC, Soumireu EJ, Audebert AJM, *Fertility & Sterility*, 37;90; 1982
8. Lannou DLe, Gastard E, Guivarch A, Laurent M.C., Poulain P., *Human Reproduction*, 10;1765;1995.
9. Shenfield F, Doyle P, Valentine A, Steele SJ, Tan SL, *Human Reproduction*, 8; 60; 1993
10. WHO laboratory manual for the examination of human semen and sperm-cervical mucus interaction, 4th edn. 1999,60, Cambridge University Press.