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**Original Article**

# Usefulness of intrauterine insemination in unexplained and male subfertility with mild form of oligoastheno teratozospermia

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**Abstract**

**Background:** Unexplained infertility is a diagnosis of exclusion after systematic evaluation fails to identify a cause. Oligospermia is defined traditionally by a sperm density <20 million/ml. Intrauterine insemination has been used to treat infertile couples for almost 200 years. Intrauterine insemination is specially appropriate for cases with mild male factor infertility, anovulation, endometriosis with at least one patent tube and unexplained infertility. IUI is considered as a first line procedure due to its simplicity, easy management low cost. In IUI (intra uterine insemination) processed semen is inserted in the uterine cavity using a small catheter at the time of ovulation in stimulated cycle.

**Objective:** To evaluate the pregnancy rate per cycle of IUI in unexplained infertility and mild male factor infertility.

**Materials and methods:** This study was interventional study carried out in the Department of Obstetrics and Gynaecology, Bangabandhu Sheikh Mujib Medical University, Dhaka in collaboration with Labaid Fertility Centre, Labaid Specialized Hospital, Dhaka from July 2016 to June 2018. Married couples with female partner aged 18 -35 years, male partner 20 -50 years. Total 148 subjects were included in this study. The patients were divided to groups groups. In group A 74 patients were unexplained infertility and group B 74 patients were mild form of oligoastheno-teratozospermia. Data was collected using a structured questionnaire (research instrument) containing all the variables of interest. The questionnaire will be finalized following pretesting. Data was processed and analyzed with the help of computer program SPSS (Statistical package for Social Science) with version 25.

**Results:** This study shows in female the average age was 29.16 years in unexplained infertility group (Group A) and 27.55 years in mild form of oligoasthenoteratozospermia group (Group B). The average age was 36.63 years in unexplained infertility group (Group A) and 35.18 years in mild form of oligoasthenoteratozospermia group (Group B). Semen concentration was 94.27 m/mil in unexplained infertility group and 16.37 m/mil in mild form of oligoastheno-teratozospermia group. 6.75% of pregnancy in unexplained infertility and 4.05% of pregnancy in mild form of oligoasthenoteratozospermia. It was observed that prewash concentration was 89.01 m/mil, prewash motility was 68.78, prewash morphology was 58.82, postwash concentration was 59.80 m/mil and post was motility was 99.21 in unexplained infertility. On the other hand in mild form of oligoasthenoteratozospermia prewash concentration was 17.76 m/mil, prewash motility was 31.35, prewash morphology was 15.00, postwash concentration was 20.33 m/mil and post was motility was 84.86. The difference was statistically significant (<0.05).

**Conclusion:** Intra Uterine Insemination (IUI) is a cheap and minimally invasive method compared to other methods of assisted reproduction. The IUI procedure is simple and may be performed even if the woman is not receiving medication to improve her egg production. Many physicians will encourage women to take medications to stimulate the ovaries in order to increase egg production and, hopefully, the chance of achieving pregnancy.

**Keywords:**Intrauterine insemination, Unexplained subfertility, Oligoastheno-teratozospermia

## Introduction

Intrauterine insemination has been used to treat infertile couples for almost 200 years. Intrauterine insemination is specially appropriate for cases with mild male factor infertility, anovulation, endometriosis with at least one patent tube and unexplained infertility.[1] IUI is considered as a first line procedure due to its simplicity, easy management low cost. In IUI (intra uterine insemination) processed semen is inserted in the uterine cavity

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using a small catheter at the time of ovulation in stimulated cycle.[1]

Unexplained infertility is infertility that is idiopathic in the sense that its cause remains unknown even after an infertility work up usually including semen analysis in the man and assessment of ovulation, fallopian tubes and normal uterine cavity in the women.[2] However, even the most sophisticated diagnostic assessment can not reveal all possible abnormalities. Therefore unexplained infertility appears to be either the lower extreme of the normal distribution of fertility or it arises from a defect in fecundity that cannot be detected by the routine infertility evaluation.[3] Pregnancy rates are lower with increasing age of the female partner and duration of infertility.[4] Although several studies have examined the effectiveness of intrauterine insemination (IUI) as treatment for unexplained infertility in natural cycle the best avaible evidence suggests that treatment with IUI in natural cycles has no clinically important effects. Some study suggested that both OH and IUI independently contributed to increased pregnancy rates.[5] Combined treatment with clomiphene and IUI is commonly recommended for couples with unexplained infertility, but best avaible evidence indicates it has no significant benefit.

Male sub fertility is a common condition amongst sub fertile couples. It is now recognized that abnormalities in the male are the sole cause of infertility and are an important contributing factor in the couple with reproductive failure.[6] One of the most frequently used fertility treatments worldwide for couples with male sub fertility is intrauterine insemination (IUI).[7] IUI is beneficial in male factor infertility because IUI appears to result in higher pregnancy rate than natural intercourse or intracervical insemination. As IUI is a simple, low cost and easy procedure and commonly done in unexplained infertility and male infertility, so we decided to do this study to observe the outcome of IUI in unexplained infertility and mild male factor abnormality with fixed ovarian stimulation protocol.

## Materials and methods

It was interventional study carried out in the Department of Obstetrics and Gynaecology, Bangabandhu Sheikh Mujib Medical University, Dhaka in collaboration with Labaid Fertility Centre, Labaid Specialized Hospital, Dhaka from July 2016 to June 2018. Married couples with female partner aged 18 -35, male partner 20 -50. Total 148 subjects were included in this study. The patients were divided to two groups. In group A 74 patients were unexplained infertility and group B 74 patients were mild form of oligoastheno-teratozospermia. Female partners having regular menstrual cycle & ovulation confirmed by D21 S. Progesterone, at least one tube is patent, uterine cavity is normal . Semen analysis is normal in male partner according to traditional WHO normal reference values (WHO 1987; WHO 1992; WHO 1999). Infertile couple with only male partner has mild oligospermia; semen count 10-20 million/ml (as according to WHO 1999 normal sperm count is >20 million/ml), mild form of asthenozospermia; total motility 30%-<50% (as according to WHO 1999 normal sperm count is >20 million/ml), mild form of teratozospermia; morphology 20–30% (as according to WHO 1999 normal sperm count is >20 million/ml), total motile sperm count before processing (million =volume x concentration x % motility): 10-20 million and female partner has no known cause of infertility. Data was collected using a structured questionnaire (research instrument) containing all the variables of interest. The questionnaire will be finalized following pretesting. Data was processed and analyzed with the help of computer program SPSS (Statistical package for Social Science) with version 25.

## Results

Table I shows in female the average age was 29.16 years in unexplained infertility group (Group A) and 27.55 years in mild form of oligoasthenoteratozospermia group (Group B). In male the average age was 36.63 years in unexplained infertility group (Group A) and 35.18 years in mild form of oligoasthenoteratozospermia group (Group B) (Table I). 71.62% were primary infertility and 28.38% secondary infertility in unexplained infertility group. 77.03% were primary infertility and 22.97%

were secondary infertility in mild form oligosthernoteratozos permia group (Table II). Table III shows the average duration of infertility were 6.31 years in unexplained infertility and 5.12 years in mild form of oligoasthenoteratozospermia group. Semen concentration was 94.27 m/mil in unexplained infertility group and 16.37 m/mil in mild form of oligoasthenoteratozospermia group (Table IV). Table VI shows 6.75% of pregnancy in unexplained infertility and 4.05% of pregnancy in mild form of oligoasthenoteratozospermia. Table VII shows prewash concentration was 89.01 m/mil, prewash motility was 68.78, prewash morphology was 58.82, postwash concentration was 59.80 m/mil and post was motility was 99.21 in unexplained infertility. On the other hand in mild form of oligoasthenoteratozospermia prewash concentration was 17.76 m/mil, prewash motility was 31.35, prewash morphology was 15.00, postwash concentration was 20.33 m/mil and post was motility was 84.86. The difference was statistically significant ($p<0.05$).

**Table I: Female age distribution of the study subjects**

| Age in years | Group A (n=74) | | Group B (n=74) | | P value |
|---|---|---|---|---|---|
| | No | % | No | % | |
| **Female** | | | | | |
| 20-25 | 18 | 24.32 | 28 | 37.84 | 0.006 |
| 26-30 | 29 | 39.19 | 22 | 29.73 | |
| 31-35 | 26 | 35.14 | 24 | 32.43 | |
| 36-40 | 1 | 1.35 | 0 | 0.00 | |
| Mean±SD | 29.16±4.06 | | 27.55±4.78 | | |
| **Male** | | | | | |
| 20-25 | 0 | 0.00 | 2 | 2.70 | 0.054 |
| 26-30 | 6 | 8.11 | 11 | 14.86 | |
| 31-35 | 28 | 37.84 | 32 | 43.24 | |
| 36-40 | 32 | 43.24 | 23 | 31.08 | |
| 41-45 | 6 | 8.11 | 6 | 8.11 | |
| 46-50 | 2 | 2.70 | 0 | 0.00 | |
| Mean±SD | 36.63±4.22 | | 35.18±4.83 | | |

Group A: Unexplained infertility
Group B: Oligoastheno-teratozospermia

**Table II: Distribution of type infertility of the study subject**

| Type infertility | Group A (n=74) | | Group B (n=74) | | P value |
|---|---|---|---|---|---|
| | No | % | No | % | |
| Primary | 53 | 71.6 | 57 | 77.0 | 0.452 |
| Secondary | 21 | 28.4 | 17 | 23.0 | |

Group A: Unexplained infertility
Group B: Oligoastheno-teratozospermia

**Table III: Duration of infertility of the study subjects**

| Duration of infertility | Group A (n=74) | | Group B (n=74) | | P- value |
|---|---|---|---|---|---|
| | No | % | No | % | |
| ≤5 years | 34 | 45.9 | 50 | 67.6 | 0.001 |
| 6-10 years | 32 | 43.2 | 17 | 23.0 | |
| 11-15 years | 7 | 9.5 | 7 | 9.5 | |
| 16-20 years | 1 | 1.4 | 0 | 00 | |
| Mean±SD | 6.31±1.89 | | 5.12±1.23 | | |

Group A: Unexplained infertility
Group B: Oligoastheno-teratozospermia

**Table IV: Semen analysis of the study subjects**

| Semen analysis | GroupA(n=74) | GroupB(n=74) | P -value |
|---|---|---|---|
| | Mean±SD | Mean±SD | |
| Concentration | 94.27±21.47 | 16.37±6.07 | 0.001 |
| Motility | 74.51±10.93 | 38.17±13.73 | 0.001 |
| Morphology | 62.52±12.23 | 23.64±13.30 | 0.001 |
| FSH | 5.94±1.83 | 5.12±2.00 | 0.011 |
| TSH | 2.30±1.12 | 2.29±1.23 | 0.957 |

Group A: Unexplained infertility
Group B: Oligoastheno-teratozospermia

**Table V: Number of mature follicle**

| No. of mature follicle | Group A (n=74) | | Group B (n=74) | | P-value |
|---|---|---|---|---|---|
| | No | % | No | % | |
| Right | | | | | |
| None | 10 | 13.51 | 0 | 0.00 | 0.282 |
| 1-3 | 61 | 82.43 | 72 | 97.30 | |
| 4-6 | 1 | 1.35 | 2 | 2.70 | |
| >6 | 2 | 2.70 | 0 | 0.00 | |
| Mean±SD | 1.37±1.44 | | 1.17±0.70 | | |
| Left | | | | | |
| None | 14 | 18.92 | 0 | 0.00 | 0.576 |
| 1-3 | 55 | 74.32 | 74 | 100.00 | |
| 4-6 | 5 | 6.76 | 0 | 0.00 | |
| >6 | 0 | 0.00 | 0 | 0.00 | |
| Mean±SD | 1.28±1.15 | | 1.20±0.46 | | |

Group A: Unexplained infertility
Group B: Oligoastheno-teratozospermia

**Table VI: Pregnancy rate of the study subject**

| Pregnancy confirmation | Group A (n=74) | | Group B(n=74) | | P- value |
|---|---|---|---|---|---|
| | No | % | No | % | |
| Yes | 5 | 6.75 | 3 | 4.05 | 0.405 |
| No | 70 | 94.59 | 72 | 97.30 | |

Group A: Unexplained infertility
Group B: Oligoastheno-teratozospermia

**Table VII: Prewash and post wash**

| Semen analysis | Group A (n=74) | Group B (n=74) | P- value |
|---|---|---|---|
| | Mean±SD | Mean±SD | |
| Prewash concentration | 89.01±23.32 | 17.76±7.87 | 0.001 |
| Prewash motility | 68.78±9.69 | 31.35±14.30 | 0.001 |
| Prewash morphology | 58.82±8.22 | 15.00±6.32 | 0.001 |
| Postwash concentration | 59.80±19.02 | 20.33±13.48 | 0.001 |
| Post wash motility | 99.21±8.90 | 84.86±15.98 | 0.001 |

Group A: Unexplained infertility
Group B: Oligoastheno-teratozospermia

**Discussion**

Intrauterine insemination (IUI) is frequently used in the treatment of infertile couples with various causes of infertility, including cervical factor, ovulatory dysfunction, endometriosis, immunological caused, male factor and unexplained infertility. It is also the mode of treatment for various ejaculatory and coital problems. IUI is generally considered to be an intermediate step of low to moderate complexity before the application of more sophisticated assisted reproductive technologies (ART).[8]

In our study, we made an effort to determine the pregnancy rate per cycle of IUI in unexplained infertility and mild male factor infertility. The variables selected were patient parameters like age of the woman, duration of infertility, type of infertility. Parameters related to ovulation induction included number of dominant follicles, endometrial thickness. Laboratory parameters like postwash motility and morphology were recorded.

In this study shows the average age was 29.16 years in unexplained infertility group and 27.55 years in mild form of oligoasthenoteratozospermia group. The difference was statistically significant (P<0.05). This findings consisted with the study of Aboulghar et al.[9]

This study found primary infertility was higher in between two groups which was 71.62% and 77.03 respectively. Similar study Edi-Osagie et al.[10] found 76% were primary infertility and 24 were secondary infertility.

The duration of infertility significantly higher in unexplained infertility than mild form of oligoasthenoteratozospermia (6.31 vs. 5.12 years, *P* = 0.031). An earlier study also found a significant decline in the success of IUI therapy as the duration of infertility increased.[11]

In this study the higher observed among women with a dominant follicle ≤17 mm, although nonsignificant, could be along the lines of previous findings and due in part to a more intense ovarian stimulation. However, contrary to other studies.[12]

No difference was noted in the success rate with regards to the type of infertility. Among indications for IUI, the success rate was higher in anovulatory and unexplained infertility patients as compared with endometriosis and male factor infertility, although the difference statistically statistical significance. The trend toward lower pregnancy rates in endometriosis has been documented in an earlier meta analysis, with the pregnancy rates reduced to half in comparison with other infertility indications.[13] The pregnancy rate in our study for male factor infertility was marginally lower than that in previously reported studies.[14,15] This study overall pregnancy rate with IUI of 6.75% of pregnancy in unexplained infertility and 4.05% of pregnancy in mild form of oligoasthenoteratozospermia is low as compared with the results from other studies.[14,15]

Another important reason for lower pregnancy rates in our setting could be our strategy of aiming for monofollicular development during controlled ovarian hyperstimulation (COH). This, while leading to lower pregnancy rates, reduces both the multiple pregnancy and the hyperstimulation rates. With the current trend of limiting the number of embryos transferred in IVF cycles, ovulation induction is emerging as the prime cause for higherorder pregnancies. Earlier studies have reported an incidence of 20% twins and 39% higherorder multiple pregnancies as a result of ovulation induction, outside assisted reproductive technology (ART).[16,17]

With respect to the sperm characteristics, higher concentration and better quality after sperm preparation were consistently related to improved pregnancy rate after IUI.[18] In this sense, the pregnancy rate observed among those with sperm count higher than 30x106 was on average double that of the middle categories ($5.1–30x10^6$) and almost five times higher than in the lowest category ($\leq 5$ $x10^6$). Therefore, our results would not support the suggested sperm count of $<10x10^6$ as the threshold value for IUI treatment of infertile couples, since still acceptable pregnancy rates may be observed with sperm count between 5.1 and 10x106. [19,20] However, the considerable decrease in pregnancy rate with ≤5 x106 would be very difficult to counterbalance by the presence of other favorable factors such as a multifollicular response or a short duration of infertility.

The sperm quality that is necessary for successful IUI is lower than World Health Organization threshold values for normal sperm. Intrauterine insemination is effective therapy for male factor infertility when initial sperm motility is > or = 30% and the total motile sperm count is > or = 5 X $10^6$. When initial values are lower, IUI has little chance of success[1]. The number of motile sperm available for insemination and especially their 24-hour survival are highly predictive of IUI success. This advanced semen analysis is an excellent screening test to evaluate couples considering IUI.[21]

**Conclusion**

IUI is usually the first step in treating couples with unexplained infertility. Controlled ovarian stimulation, with intrauterine insemination, has proved successfully in the treatment of marital infertility, especially in cases of ovulation disorders, disorders of cervical factors, disorders of man`s sperm gram , mild forms of endometriosis and infertility of unknown causes. IUI is a cheap and minimally invasive method compared to other methods of assisted reproduction. Numerous reports indicate that the pregnancy rate is much higher if IUI is combined with controlled ovarian stimulation. The IUI procedure is simple and may be performed even if the woman is not receiving medication to improve her egg production. Many physicians will encourage women to take medications to stimulate the ovaries in order to increase egg production and, hopefully, the chance of achieving pregnancy.

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