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EFFECT OF AGE AND BMI ON PREGNANCY OUTCOME IN PATIENTS UNDERGOING IUI

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ABSTRACT **Introduction:** Intrauterine insemination (IUI) is the first line of assisted conception method, which has been widely used for the treatment of subfertility couples. It is a technique in which the semen is processed into highly concentrated motile sperm and inseminated into the uterus through the cervix using a fine catheter. It is often suggested to infertile couples of which the woman has at least one patent fallopian tube. Many prognostic factors are associated with successful pregnancy in IUI cycles e.g., younger female age, higher total motile sperm per ejaculate, better ovarian reserve, and more number of dominant follicles. The present study aims to study the influence of female's age and body mass index on pregnancy rates following IUI procedure. **Methodology:** This retrospective observational study was done from June 2021 to June 2022 on 60 couples who underwent IUI at KVGMCH, sullia. The patients included in the study were aging between 19-45 years. Weights and heights of women were recorded and BMI was calculated. They were classified into 4 BMI categories. The IUI procedure was carried out and pregnancy outcome was measured as positive urine pregnancy test. **Results:** The overall pregnancy rate after IUI in the study group was 15%. Highest pregnancy rate of 18.75%, was observed in the age group of 31-35 years, as compared with 10% pregnancy rate among 41-45 years. However this difference was not statistically significant (p-0.9877),one pregnancy occurred at 42 years among 10 women over 41 years of age, whereas 3 pregnancy occurred among 16couples. BMI was calculated and tabulated according to WHO definition. The highest pregnancy rate was observed as 20% for BMI >/ 35, while the lowest pregnancy rate was 12.5% with the BMI from 18.5 to 25.5. This difference was also not statistically significant(p-0.96992). **Conclusion:** The study concludes that IUI improves the chances of pregnancy in unexplained infertility. The efficacy of IUI is highest in middle age and efficiency declines after the age of 45years. Pregnancy outcome is independent of BMI of women.

KEYWORDS : Infertility, Intrauterine insemination, Pregnancy rates.

INTRODUCTION

Infertility is a condition with psychological, economic, medical implications resulting in trauma, stress, particularly in a social set-up like ours, with a strong emphasis on child-bearing. According to the International Committee for Monitoring Assisted Reproductive Technology, World Health Organization (WHO), infertility is a disease of reproductive system defined by failure to achieve the clinical pregnancy after 12 months or more of regular unprotected sexual intercourse[1]. It can also be defined as failure of couple to conceive after 12 months of regular intercourse without the use of contraception in women <35 years; and after 6 months of regular intercourse without the use of contraception in women ≥35 years[2].

As per the WHO, the overall prevalence of primary infertility ranges between 3.9% and 16.8%[3]. Also, the estimates of infertility vary widely among Indian states from 3.7% in Uttar Pradesh, Himachal Pradesh, and Maharashtra[4], to 5% in Andhra Pradesh[5], and 15% in Kashmir[6]. Moreover, the prevalence of primary infertility has also been shown to vary across the tribes and castes within the same region in India[4,7].

It was reported that 40% of infertility cases were related to men, 40% of women and 20% of both sexes[8]. According to a multicentric study conducted by WHO from 1982 to 1985, 20% of cases were attributed to male factors, 38% to female factors, 27% had causal factors identified in both partners, and 15% could not be satisfactorily attributed to either partner[9]. In Indian couples seeking treatment, the male factor is the cause in approximately 23%[6]. A recent report on the status of infertility in India, states that nearly 50% of infertility is related to the reproductive anomalies or disorders in the male[10]. In addition, over 25% of infertility cases, no detectable cause can be traced after routine tests, which leaves the case as unexplained infertility[10].

Therapeutic intrauterine insemination (IUI) with partner's spermatozoa is usually the first-line treatment of many clinics for patients with unexplained infertility or cervical or male factor infertility (Martinez et al, 1993). Success appears to rely on combining stimulation of the ovaries with correct timing of IUI with adequate numbers of prepared spermatozoa[11].

In the literature, many factors have been reported as influencing pregnancy rates after IUI: the woman's age, the length of infertility, indications (type of infertility), the sperm count in the initial analysis or in the catheter, the number of mature follicles, the E_2 concentration on the day of hCG administration, and the type of catheter used[12].

The present study was taken up to study the effects of female age and body mass index (BMI) on IUI result.

AIMS AND OBJECTIVES OF STUDY

The main objectives of present study were:

- To study the effect of female age on pregnancy outcome in IUI.
- To know the effect of BMI of the patient on IUI result.

MATERIALS AND METHODS

The present study was a retrospective observational study, done from June 2021 to June 2022 on 60 couples with infertility problem. The study was conducted in KVG Medical College and Hospital, Sullia. All the study subjects underwent IUI procedures. The female patients aging between 19 to 45 years were included in the study. The study subjects were weighed and their heights were recorded from which their BMI was calculated according to WHO definition, and they were classified into 4 BMI categories accordingly. A basic infertility workup which included medical history, physical examination, ultrasonography (USG) abdomen, hormone study, hysterosalpingography (HSG), semen analysis of their partner was performed and results were noted. All the women eligible for IUI treatment were stimulated with ovulation induction agent, letrozole (2.5 mg). Serial follicular monitoring was done from day 9 of the subject's cycle. Trigger was given as HCG injection (10000 IU) once the follicle size reaches >18mm, 36 hours prior to IUI. On the day of IUI, their partner was instructed to give semen sample by masturbation in a sterile wide mouth container with abstinence of 2-3 days after taking informed consent. Semen preparation was done using double density gradient method. 1ml of 80% gradient (sperm Grad, Vitrolife) was placed into 15 ml conical tube with transfer pipette. 2 ml of 40% gradient solution (sperm Grad,Vitrolife) was overlaid on it and then 1ml of fresh semen sample was overlaid on the gradient. The specimen centrifuged at 2000 rpm for 20 minutes, supernatant removed but the

bottom 0.3 to 0.5 ml and pellet was kept. 3 ml of fresh medium was gently mixed. Second wash was done by centrifuging the specimen at 1500 rpm for 5 minutes, supernatant removed and pellet was re-suspended in 0.5 ml of fresh media added and using IUI catheter. Semen preparation was injected into uterine cavity. Patient was asked to review on day 2 to 5 of her menstrual cycle or 1 week after missed cycle. Pregnancy outcome was measured as positive urine pregnancy test.

RESULTS

Women of age group 19 to 45 years were taken into the study. Overall pregnancy rate was noted as 15%, Highest pregnancy rate in our study was observed to be 18.75%, observed in the age group of 31 to 35 years, as compared with 10% pregnancy rate among 41 to 45 years. This difference was not statistically significant (p-0.9877). One pregnancy occurred at 42 years among 10 women over 41 years of age and 3 pregnancy occurred among 16 women with 31-35yrs age as shown in table 1.

BMI was calculated and tabulated according to WHO definition. The relationship was shown in table 2. The highest pregnancy rate was 20% for BMI >/ 35 kg/m^2, while the lowest pregnancy rate was 12.5% with the BMI from 18.5 to 25.5. This difference was also not statistically significant(p-0.96992)

Table 1: Relation between age and pregnancy rate of infertile women treated with intrauterine insemination.

Age (years)	Number of patients (%)	Number of pregnancies (pregnancy rate %)	P value
19-25	12 (20%)	2 (16.66%)	0.9877 X^2 =0.3307
26-30	14 (23.33%)	2 (14.28%)	
31-35	16 (26.6%)	3 (18.75%)	
36-40	8 (13.33%)	1 (12.5%)	
41-45	10 (16.66%)	1 (10%)	

Table 2: Relation between Body Mass Index (BMI), and pregnancy rate of infertile women treated with intrauterine insemination.

BMI (kg/m^2)	Number of patients (%)	Number of pregnancies (pregnancy rate %)	P value
Normal (18.5 - <25)	24 (40%)	3 (12.5%)	0.9795 X^2 =0.188
Over weight (25 - <30)	18 (30%)	3 (16.66%)	
Obese (30-<35)	13 (21.66%)	2 (15.38%)	
Highly obese (≥ 35)	5 (8.33%)	1 (20%)	

DISCUSSION

In our study we inspected the results obtained to determine whether woman's age and BMI contribute to the success rate of IUI**.** From the data presented in table 1, it is shown that there is good IUI outcome up to 40 years of age. Some studies have reported good outcome only upto 30yrs of age and favourable results can be expected upto 35yr. Although in our study there is a decline of pregnancy rate by 50% in 26 to 30 years of age group, the difference was not statistically significant. Women in the age group of 26-30yr are reproductively more active and will be trying to conceive, infertility among them will be complicated and IUI is not a better option for such women. With the exception of 26-30yr age group the results of our study corresponds to other studies. The lowest pregnancy rate (10%) was observed in the subjects with age more than 40 years. Consequently it was advised that women of 43 years or older seeking infertility treatment go directly for other methods.

Pregnancy rate among those with normal BMI was found to be 12.5% whereas, those who were highly obese had pregnancy rate of 20% concludes that maternal BMI doesn't have negative effect on fertility, this result is consistent with other studies.

In the study conducted by Merviel P et al[13], at the time of the first IUI cycle, the woman's mean age was 31.5 ± 4.4 years, and the mean body mass index (BMI) was 23.6 ± 14.4 kg/m^2 and they conclude good pregnancy outcome among these age group and BMI In the study conducted by Ibérico G et al[14], female age ranged from 18 to 43 years (mean ± SD: 32.6 ± 3.8). The overall PR per cycle was 9.2%. Overall, female age was not significantly associated with PR in multivariate analysis (*P*=.18). The highest OR for PRs was observed among the youngest women, and the lowest, among women between 30 and 34 years of age. Women 40 years and older presented slightly lower ORs than the youngest women but higher than the women 30–34 years old although estimates did not reach statistical significance and were based on only a few observations. Montanaro Gauci M et al[15] postulated that the age of the woman was also found to have a linear (negative) association with pregnancy. Marked decreases were found in the clinical pregnancy rate in the females aged ≥ 40 years and the cases in the study conducted by Liu WJ et al[16].

Anabel Starosta et al conducted study on predictive factors for IUI where they have concluded elevated maternal BMI increases medication requirements without impacting pregnancy outcomes.[17] Result of a study conducted by Huijuan Guan et al revealed BMI has no significance on pregnancy outcome.[18]

CONCLUSION

The present study concludes that IUI improves the chances of pregnancy in unexplained infertility. The efficacy of IUI is highest in middle age. Efficiency declines after the age of 45 years. BMI of women has no significant role on IUI outcome.

REFERENCES

1. Zegers-Hochschild F, Adamson GD, de Mouzon J, Ishihara O, Mansour R, Nygren K, et al. International Committee for Monitoring Assisted Reproductive Technology (ICMART) and the World Health Organization (WHO) revised glossary of ART terminology, 2009. Fertil Steril. 2009;92:1520–4.
2. Practice Committee of the American Society for Reproductive Medicine. Definitions of infertility and recurrent pregnancy loss. Fertil Steril. 2008;90(5 Suppl):S60.
3. Calverton, Maryland, USA: ORC Macro and the World Health Organization; 2004. World Health Organization. Infecundity, Infertility, and Childlessness in Developing Countries. DHS Comparative Reports No 9.
4. Talwar PP, Go OP, Murali IN. New Delhi: National Institute of Health and Family Welfare and Indian Council of Medical Research; 1986. Prevalence of infertility in different population groups in India and its determinants. Statistics and Demography. [Google Scholar]
5. Unisa S. Childlessness in Andhra Pradesh, India: Treatment-seeking and consequences. Reprod Health Matters. 1999;7:54–64. [Google Scholar]
6. Zargar AH, Wani AI, Masoodi SR, Laway BA, Salahuddin M. Epidemiologic and etiologic aspects of primary infertility in the Kashmir region of India. Fertil Steril. 1997;68:637–43. [PubMed] [Google Scholar]
7. Kumar D. Prevalence of female infertility and its socio-economic factors in tribal communities of Central India. Rural Remote Health. 2007;7:456. [PubMed] [Google Scholar]
8. Sadock BJ, Sadock VA. 9th ed. Philadelphia: Lippincott Williams and Wilkins; 2003. Kaplans and Sadocks Symptoms of Psychiatry Behavioral Sciences Clinical Psychiatry; pp. 872–4. [Google Scholar]
9. World Health Organization. Towards more objectivity in diagnosis and management of male infertility. Int J Androl. 1987;7:1–53. [Google Scholar]
10. Kumar TCA. Fertility and in-vitro fertilization in India. Curr Sci. 2004;86:254–6.
11. M.J. Tomlinson, J.B. Amissah-Arthur, K.A. Thompson, J.L. Kasraie, B. Bentick, Infertility: Prognostic indicators for intrauterine insemination (IUI): statistical model for IUI success, Human Reproduction, Volume 11, Issue 9, 1 September 1996, Pages 1892–1896,
12. Merviel P, Heraud MH, Grenier N, Lourdel E, Sanguinet P, Copin H. Predictive factors for pregnancy after intrauterine insemination (IUI): an analysis of 1038 cycles and a review of the literature. Fertil Steril [Internet]. 2010;93(1):79–88. Available from: http://dx.doi.org/10.1016/j.fertnstert.2008.09.058
13. Merviel P, Heraud MH, Grenier N, Lourdel E, Sanguinet P, Copin H. Predictive factors for pregnancy after intrauterine insemination (IUI): an analysis of 1038 cycles and a review of the literature. Fertil Steril [Internet]. 2010;93(1):79–88. Available from: http://dx.doi.org/10.1016/j.fertnstert.2008.09.058
14. Ibérico G, Vioque J, Ariza N, Lozano JM, Roca M, Llácer J, et al. Analysis of factors influencing pregnancy rates in homologous intrauterine insemination. Fertil Steril [Internet]. 2004;81(5):1308–13. Available from: http://dx.doi.org/10.1016/j.fertnstert.2003.09.062
15. Montanaro Gauci M, Kruger TF, Coetzee K, Smith K, Van Der Merwe JP, Lombard CJ. Stepwise regression analysis to study male and female factors impacting on pregnancy rate in an intrauterine insemination programme: P<scp>regnancy rate in</scp> IUI. Andrologia [Internet]. 2001;33(3):135–41. Available from: http://dx.doi.org/10.1046/j.1439-0272.2001.00428.x
16. Liu WJ, Li WT, Zhang RL, et al. [Factors influencing the clinical pregnancy rate following intrauterine insemination]. Zhonghua nan ke xue = National Journal of Andrology. 2015 Nov;21(11):992-996. PMID: 26738325.
17. Anabel Starosta, Catherine E Gordon , Mark D Hornstein. Predictive factors for intrauterine insemination outcomes: a review, 2020 Dec 11;6(1):23. doi: 10.1186/s40738-020-00092-1.
18. Huijuan Guan, Huaiyun Tang, Linqing Pan, Hang Song, Lisha Tang. Pregnancy predictors in unexplained infertility after intrauterine insemination., Journal of Gynecology Obstetrics and Human Reproduction Volume 50, Issue 8, October 2021, 102071