

Outcome of Intra Uterine Insemination in Sahara International Fertility Centre Pokhara, Nepal

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ABSTRACT

Introduction

The incidence of infertility is about 10 to 15 % among reproductive age group. The cause of infertility may be either due to male factor or female factor or both. The main aim of this study was to evaluate the success rate of intrauterine insemination (IUI) in a private centre of Pokhara.

Materials and Methods

This was a centre based retrospective study done in private fertility centre. Sub-fertile couples who were treated from January 1st 2015 to December 31st 2016 were enrolled for the study. Couples with unexplained male factor, ovulatory dysfunction, unilateral tubal occlusion and ejaculatory dysfunction were included in this study. Three hundred and eighty IUI cases were retrospectively reviewed. Clinical pregnancy rate was the primary outcome.

Result

The success rate of IUI was 15.7%. It was higher among unexplained infertility cases. Clinical pregnancy rate was directly associated with the age of the patients, indications of infertility and number of cycles.

Conclusion

Success rate of IUI in infertile couples who had unexplained infertility, tubal factor, ovulatory dysfunction was higher than male factor infertility and ejaculatory dysfunction.

Keywords: Dysfunction, Infertility, Intrauterine insemination.

INTRODUCTION

Infertility is defined as a couple who are unable to conceive within a year of regular unprotected sexual intercourse without using any contraceptives. World Health Organization has listed infertility as a global public health problem.¹ In WHO meeting speakers argued that a major millennium development challenge will be to manage the estimated 80 million infertile couple in the world who are unable to conceive.¹

The incidence of infertility is about 10 to 15 % of reproductive (15 to 45 years) age group^{2,3} Among them, the cause is divided into 40% male factor,

40% female factor and 20% both and the treatment procedure depends on the cause. Modalities of treatment are ovulation induction in anovulation or ovulation dysfunction, hydro-tubation and tubal surgery in tubal pathology and reconstruction surgery if there are congenital anomalies of the uterus.⁴ Other modalities of treatment like intrauterine insemination (IUI), invitro fertilization (IVF), intracytoplasmic sperm injection (ICSI) are most commonly practiced methods in Nepal, India and other countries.⁵

Among these treatment modalities we discuss Intrauterine insemination which is very economic,

least invasive, affordable, accessible, first line assisted conception with reasonable success rate as compared to the other treatment methods.² IUI is deposition of processed and well prepared or washed semen in intrauterine cavity with special technique during the time of ovulation.² Semen for IUI may be from husband (H) or from unknown donor (D) which are used in cases of azoospermia, severe oligospermia and ejaculatory dysfunction not resolved by other treatment.

Indication of IUI in male may be impotence or ejaculatory defect, hypospadias, neurological disorder like spinal cord injury, diabetes mellitus, multiple sclerosis, retrograde ejaculation, subnormal sperm parameter etc. Similarly in females, IUI is done in ovulatory dysfunction and tubal causes like unilateral tubal block or poor spillage.²

Aim of this study was to evaluate the success rate of intrauterine insemination.

MATERIALS AND METHODS

This was a centre based retrospective study done in Sahara International Fertility Centre, Pokhara to find out the success rate of Intrauterine Insemination in infertile couple. Three hundred and eight cases between 1st January 2015 and 31st December 2016 were enrolled for the study.

Ethical clearance was taken from the Board of Sahara Fertility Centre. The inclusion criteria included age less than 40 years, at least one patent fallopian tube, no associated genital organ anomaly and normal semen parameters. The exclusion criteria included women with bilateral fallopian tube block, severe oligospermia and surgical sperm retrieval cases.

Basic history was taken from each couple regarding patient's identification or personal profile like duration of marriage, occupation, habits like chronic smoking, alcohol use, tobacco chewing, drug abuse, and any medical as well as surgical problems. General physical examination along with systemic examination as well as specific examination of the pelvic or genital organs were done.

Baseline investigations including complete haemogram, blood biochemistry and hormonal assay of Antimullerian Hormone (AMH), Follicular Stimulating Hormone (FSH), estradiol and Luteinizing Hormone (LH) were done on day two or day three of the cycle. Trans-Vaginal Ultrasound (TVS) was done on day three to see the antral follicular count and size of the follicles to rule out polycystic ovary or poor ovarian

reserve. Semen analysis of male partner was done.

Hysterosalpingography (HSG) was done to see the tubal patency between day seven to day ten of cycle. Controlled ovarian stimulation was done by clomiphene citrate 100 mg once daily from the day two to day seven of cycle (5 days) or letrozole step up protocol consisting of tab letrozole 2.5 mg one, two, three, four and five tabs daily on day 2,3,4,5 and 6 of cycle respectively. Ovulation monitoring was performed by Trans-Vaginal Sonography on day 8 of ovulation to evaluate size and number of follicles and endometrial thickness. Hormones estradiol and LH were evaluated. The responses to these drugs were evaluated as, the dominant follicle reaching the size upto 14 mm or the growth rate of each follicle by 2 mm/day. Some of the patients who did not respond to oral drugs in previous cycle were given daily intramuscular injection of 75-150 international unit of human menopausal gonadotrophin from day three on alternate day till the dominant follicle reached 18 to 20 mm. Estradiol 2 mg were given two to three times a day from the day of ovulation induction to prepare the endometrial thickness more than 7 mm. When the dominant follicle reached the size of 18-20 mm, triggering was done by injection β hCG 5000 iu intramuscularly.

After 3 to 5 days of abstinence and 2 hours before insemination, semen was collected by masturbation at semen collection room and sent to the laboratory for the semen preparation. After liquefaction at 37 degree Celsius, semen analysis was performed. The quality of the specimens was assessed by evaluating sperm concentration, motility, morphology, presence of round cells as per the WHO criteria.⁶ Ejaculated sperm was prepared by double density gradient method. After preparation, number and motility of sperm were re-evaluated and loading of washed and prepared sperm was done in IUI catheter for insemination.

The volume of semen for insemination should be at least 0.4 to 0.6 ml and should provide sperm count of at least 1 million motile sperm/ml.⁷ Patients were instructed to have full bladder. Patient was kept in lithotomy position and vulva was cleaned. With the help of Cusco's bivalve speculum the cervix was visualized. Insemination was done into intrauterine cavity very slowly. The patient was kept in low head position for fifteen minutes. If she experienced abdominal pain, or fever she was advised to report immediately. Luteal phase was supported by progesterone orally, vaginally or parenteral route. Couple could have intercourse at

any time after an IUI was performed and could return to work if they wished. The female was advised to take pregnancy test 14 days after IUI.

Luteal phase support was done by natural progesterone 200mg and 75mg once daily for two weeks along with folic acid.

RESULT

380 couples who attended this centre for the treatment were analysed. Age distribution, indications of IUI and success rate of IUI were calculated.

Table 1: Age distribution (n=380).

Age in year	No. of Male	No. of Female
21-25	102 (26.8%)	143 (37.6%)
26-30	125 (32.8%)	112 (29.4%)
31-35	101 (26.5%)	80 (21.05%)
36-40	52 (13.6%)	45 (11.8%)

There were 143 females of age group 21-25 years (37.6%) and 125 males were of age group of 26-30 years.

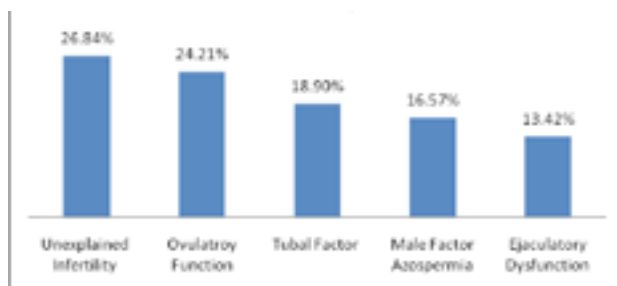


Figure 1. Indication of IUI.

The main indication of IUI in our study was unexplained infertility (n=102, 26.84%). The least common cause was ejaculatory dysfunction 13.42%

Table 2: Success rate of IUI (n=380).

Cycle	No of clients	Clinical pregnancy n	%
1	152	18	11.8
2	120	19	15.8
3	108	23	21.2
Total	380	60	15.7%

The overall success rate of IUI was 15.7% (n=60). IUI was done in total three cycle among which clinical pregnancy in first cycle was 11.8% (n=18). 19 (15.8%) cases became clinically pregnant in second cycle Third

cycle IUI was done in remaining 108 cases among which 23 (21.2%) become positive in urine pregnancy test.

Table 3: Success rate according to age (n=380).

Age of clients	Number (n) of IUI	Success (n)	Success (%)
21-25	143	30	20.97
26-30	112	18	16.07
31-35	80	09	11.25
36-40	45	03	6.66
Total	380	60	

Our study revealed that the highest number of success was seen in early age group of 21- 25 years (20.97%) and the least in elder patient of age group 36-40 years (6.66%.)

Table 4: Success of IUI according to indication.

Indication	number	Success rate (n)	(%)
Un explained	102	16	15.7
Ovulatory dysfunction	92	14	15.21
Tubal factor	72	11	15.27
Male factor			
Azospemia	63	12	19.0
Ejaculatory dysfunction	51	7	13.72
Total	380	60	

The maximum success was seen in unexplained infertility. The least success was seen in ejaculatory dysfunction (9.8 %).

DISCUSSION

IUI is the most common and widely used treatment method for infertile couples with unexplained infertility, ovulatory cause and male factor infertility. The success rate depends on sperm parameter, ovulation stimulation protocol and female factors.

The overall success rate in our study was 15.7% which is comparable with the study done by Dinelli et al where he concluded 2019 cycles of IUI and found success rate of 14.8%.³ Similarly Merviel et al in an analysis of 1038 cycles of IUI found the success rate of 14.7% wich is also comparable with our study.⁸

Age has an important impact on the success rate after insemination. The pregnancy rate per patient

was significantly higher for women with lesser age in comparison to advanced age group i.e. age more than 40 years (5.4%) which is shown by the study conducted by Dinelli et al.³ Similarly in our study also the success declined with advancing age 11.6% at age 36-40 years. The slight disparity in the success percentage may be due to less cycle of IUI and the age group of less than 40 years.

In the study conducted by Monrasin et al where in seven French Artificial Reproductive Technology (ART) centers found the success rate increase with the decreasing age which ranges between 8.4% to 17.6%.⁹ According to their data the mean age group was of 26-35 years and Intrauterine insemination was first line of treatment by ART. The maximum conception rate in our study was within 21-30 years which accounted for 18.8 % but in similar age group in a study done by Monrasin et al the success rate was slightly higher 25%.⁹ This may be due to small sample size and early marriage in our country than in French population. Similarly the conception and delivery rate decreased as age increased. It is well established that a woman in advancing age has lower ovarian response to controlled ovarian hyperstimulation declining the pregnancy outcome.¹⁰ Gomez in his study with 6139 insemination cycles performed during 18 years (1980–1997) on age group 18-48 years concluded that the older women needs more IUI treatment cycles.¹¹

Among many indications of IUI, in our study only few indications were taken for the study and unexplained infertility was the common indication accounting for 26.84% of total study group.^{12,13}

Among couples experiencing infertility, it has been estimated that between 15% and 37% have infertility with no identifiable etiology.¹² The success rate in our study of unexplained infertility was 19.6% but in a study done by Dickey et al they obtained the clinical pregnancy rate per couple of 35.1% in unexplained infertility.⁸

Women with ovulatory dysfunction undergoing ovarian stimulation with clomiphene citrate and intrauterine

insemination may benefit from administration of human chorionic gonadotropin. 92 (24.21%) clients of the study group were of ovulatory dysfunction consisting and 14(15.21%) cases conceived after ovulation induction. One study showed that women with ovulatory dysfunction undergoing ovarian stimulation with clomiphene citrate for intrauterine insemination may benefit from administration of human chorionic gonadotropin, with higher pregnancy rate (24.6%).¹⁴ Tubal factor in which unilateral tubal block or partial block with poor spillage as diagnosed by HSG had pregnancy rate of (n=11) 15.2% irrespective of proximal or distal occlusion in our study. During the period of 2003 to 2010 retrospective data was taken from 37 infertile women with unilateral tubal occlusion diagnosed by HSG and where IUI were done. The pregnancy rate per cycle was 17.3% for unilateral tubal occlusion group. Similarly Lin MH et al in 2013 had pregnancy rate of 16.5% which is comparable with our study.^{15,16} But in one of the study group with 133 patient treated for the unilateral tubal block with ovarian stimulation diagnosed by HSG during 2005-2011 the pregnancy rate was 12.5%.¹⁷ The higher rate of success in our study may be due to our study not classifying the cases as proximal or distal block.

The success of donor IUI for azospermia was 15.8% in our study. Similarly in a study by Bokham et al, 1001 women of 18 to 48 years age group were inseminated with donor spermatozoa and pregnancy was seen in 12.6% which is comparable with our study.¹⁸

The clinical pregnancy rate is increased with increased number of cycles in our study (11.8% in first cycle, 15.8% in second cycle and 21.2% in third cycle). Generally average number of cycles of IUI is three. One of the study show that the pregnancy chances increases with subsequent early cycles.^{4,15}

CONCLUSION

The success of IUI depended upon the cause of infertility and the age of the couple where unexplained infertility and young couples have higher success rate.

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