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Original Research Article

DESCRIPTIVE STUDY OF FEMALE FACTOR INFERTILITY BY CLINICAL, HARMONAL, SONOLOGICAL AND ENDOSCOPIC EVALUATION

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ABSTRACT

Background: Aim: Descriptive study of female factor infertility by clinical, hormonal, sonological and endoscopical evaluation.
Materials and Methods: Prospective Observational study conducted with a detailed history, clinical examination and basic investigations including HSG, USG, FSH, thyroid profile, prolactin were done in 100 cases of infertile women.
Results: Out of 100 cases 68 cases were primary infertile and 32 were secondary infertile. The major infertile patients having duration of infertlity is 1-5 yrs i.e. 54%, in that Primary Infertile are 57%, Secondary infertile are 47%. Majority of secondary infertile women, 19 cases (59%) had previous history of abortions. Uterine factors accounted for 6% of infertility cases. 23 (33.82%) primary, 17 (53%) secondary infertile women had abnormal HSG findings. Most common being B/L tubal block, which contributes 15%, in this 13% primary and 22% secondary. Ovarian factors contributed to 49% of the cases in which laparoscopy was performed. 36% of primary and 13% of secondary infertility was caused by ovarian factors. PCOS was the leading ovarian factor responsible for infertility. Tubal factors were responsible for 22% primary and secondary infertility cases. Out of 8 cases of B/L tubal blocks, 6 were primary and 2 were secondary infertile. Uterine abnormalities contributing to 14% of total cases in which laparoscopy was performed. Peritoneal factors accounted for 21% cases of infertility. Among peritoneal factors, pelvic adhesions was found to be the leading factor. Majority of Infertility patients (70%) had B/L positive chromopertubation. Bilateral negative dye test was seen in 14% cases.
Conclusions: All the clinical, harmonal, sonological and laproscopic findings are required in evaluation of all infertile patients. It will also be possible in formulating a specific plan of management and segregate the patients who will need ART at the earliest.
Keywords: Assisted Reproductive Technology(ART), PolyCystic Ovarian Syndrome(PCOS), Hysterosalpigography (HSG).

INTRODUCTION

The different needs in reproductive health are simultaneous and consecutive related needs. People cannot be healthy, if they have one element of the Reproductive Health package but miss others. Our culture demands that, for a woman to be socially acceptable, she should have at least one biological child. For many couples, the inability to bear children is a tragedy. The conflux of personal, interpersonal, social, and religious expectations brings a sense of failure, loss, and exclusion to those who are infertile. Relationships between couples can become very strained when children are not forthcoming. One partner may seek to blame the other as being defective or unwilling. Socially, most societies are organized, especially in the developing countries, such that children are necessary for care and

maintenance of older parents. Even in developed countries with social support systems, children and family are expected to provide much of the care for the elderly. Childless couples are also excluded from taking leading roles in important family functions and events such as birthdays, christenings, confirmations and weddings of their children. Moreover, many religions assign important ceremonial tasks to the couple's children.[1,2]

Infertility is defined as a "Disease of the Reproductive System" and results in disability. Despite the high burden, couples and individuals, who desire but are unable to achieve and maintain a desired pregnancy, have needs which are not being addressed, especially in lower resource settings worldwide. Infertility and subfertility affect a significant proportion of humanity. WHO has calculated that over 10% of women are inflicted – women who have tried unsuccessfully, and have remained in a stable relationship for five years or more. Estimates in women using a two year time frame, result in prevalence values 2.5 times larger. The burden in men is unknown. The overall burden of subfertility/infertility is significant, likely underestimated, and has not displayed any decrease over the last 20 years.[3,4]

In 2006, the UN General Assembly adopted the Secretary-General's report recommending the inclusion of the target to achieve universal access to reproductive health under the Millennium Development Goal 5, improve maternal health. Treatment for infertility is long, costly and often unsuccessful. Infertility implies apparent failure of a couple to conceive while 'sterility' indicates absolute inability to conceive.[5] The innovation of human in vitro fertilization (IVF) was developed by Robert Edwards, who was honored with the Nobel Prize in 2010. Therapies and treatments associated with IVF can also be utilized to avoid hereditary disease in offspring, to address male factors, to decrease STI/HIV transmission, to address the trend in desired older-aged parenthood, or to aid those who face cancer therapies that jeopardize their reproductive potential.

MATERIALS AND METHODS

Prospective Observational study was conducted in the Department of Obstetrics and Gynaecology, Gandhi Hospital, Secunderabad. This study includes 100 cases of infertile women who had attended the OP department of Obstetrics and Gynaecology of Gandhi Hospital, Secunderabad, were taken randomly from November 2017 to August 2019. The study was conducted after taking approval from the ethical committee.

Sample Size and Technique: The sample size consists of 100 patients of primary and secondary infertility after satisfying the inclusion and exclusion criteria.

Inclusion Criteria: Patient in reproductive age group 20-40 years in unprotected sex for one year in infertile women.

Exclusion Criteria: Married life < 6 months, unprotected sex for < 6 months, abnormal semen analysis cases/male infertility cases and tubal recanalization cases

All the patients were briefed adequately about the evaluation of cause of infertility, simplicity and accuracy of the procedures and hence the patient compliance was excellent. After taking informed consent a careful detailed history taken from both the partners particularly marital history, menstrual history, obstetric history and past medical history as per proforma. A thorough clinical examination including general examination and gynaecological examination was done. Thorough baseline investigations were done. For the evaluation of male partner semen analysis was done in all the cases. After taking detailed history proceeded for physical examination like external markers of hyperandrogenism (hirsutism, acne, hyper pigmentation, acanthosis nigricans) BMI, virilising features, pallor, thyromegaly, breast, spine examination and other general features. Any palapable mass per abdomen like fibroids, ovarian mass, organomegaly and lymphadenopathy.

Inspection of Cervix and vagina, any lesions of vagina and cervix, white discharge, cervical OS(pinpoint or normal), length of the cervix and position of cervix. Bimanual examination to know the uterus position, size and associated pelvic or adenxal pathology. Along with routine investigations specific hormonal profiles like prolactin, Thyroid profile, FSH, LH, and only those who had Hirsutism and virilising features serum free testosterone was done.

Seminal analysis was done as a basic investigation. If, it is abnormal, the case was referred to urologist for further evaluation and management. Abnormal semen analysis cases were excluded from my study. Serum FSH and LH were done on second day of menstrual cycle.

Trans Abdominal Scan (TAS): To know uterus size, uterine abnormalities, ovarian volume, ovarian abnormalities, adnexial pathology, pouch of douglas, kidneys(to know associated renal anomalies), organomegaly, lymphadenopathy and other intra abdominal pathology. TVS: For minor adnexal pathology and also for ovarian reserve by preantral follicular count, volume and ovarian volume.

Hysterosalpingography: It is usually 3-5 min procedure.HSG is done before 12-14 days of menstrual cycle. Before this procedure patients consent was taken and procedure was explained. Inj.Buscopan I.M given to decrease the pain and tubal spasm. 2) Bladder should be emptied.

Procedure

Patient should be in lithotomy position. Cervix and vagina are cleaned with betadine swab, posterior vaginal wall retracted with sims speculum. Anterior cervical lip held with valselum. Uterocervical length

measured with uterine sound, serial dilators passed, Cervical canula introduced into cervix. By pulling the cervix with valselum, utero cervical canal held in a line. Water soluble dye of 5-8 ml instilled followed by again 5-8 ml instilled latter to overcome the tubal spasm. During this period x-ray was taken.

X-ray film examined for uterus cavity size, shape, looked for any developmental anomalies (unicornuate, septate, bicornuate, didelphys), submucous myomas, intrauterine adhesions, endometrial polyps and also for spillage through the tubes, for hydrosalpinx, size and shape of fallopian tubes. Antibiotics (Tablet Doxycycline 100 mg B.D) was given for 5-7 days, 1-2 days prior to the procedure to 3-5 days after procedure to prevent acute salpingitis and upper genital tract infections. Hysterolaparoscopic and chromopertubation was done and looked for uterine, tubal, ovarian and peritoneal findings contributing infertility.

RESULTS

Total study population is 100 infertile women (n=100). In present study, 68cases (68%) were primary infertile and . 32cases (32%) were secondary infertile women

Table 1: Duration and age of patient with Infertility

Duration of Infertility	Primary(68)		Secondary(32)		Total(100)	
(in years)	No.	%	No.	%	No.	%
1-5	39	57%	15	47%	54	54%
6-10	23	34%	11	34%	34	34%
11-15	4	6%	4	13%	8	8%
16-20	2	3%	2	6%	4	4%
Total	68	100%	32	100%	100	100%
Age in years						
20-25	39	57%	9	28%	48	48
26-30	18	26%	13	41%	31	31
31-35	6	9%	8	25%	14	14
36-40	5	7%	2	6%	7	7
Total	68	68%	32	32%	100	100

The major infertile patients having duration of infertlity is 1-5 yrs i.e. 54%, in that Primery Infertile are 57%, & Secondary infertile are 47%.

Table 2: Obstetric History in Secondary Infertile women

Obstetric category	Number (32)	%
Previous Abortion	19	59%
Preterm delivery	5	16%
Normal delivery	4	13%
Caesarean section	2	6%
Intrauterine death	2	6%

In present study majority of secondary infertile women, 19 cases (59%) had previous history of abortions. Out of 19 cases, 15 cases had spontaneous and 4 cases had induced abortions. Out of 15 spontaneous, 12 cases had history of check curettage.

Table 3: Distribution in infertile women

BMI	Primary(68)		Secondary (32)		Total(100)	
	No.	%	No.	%	No.	%
Normal (18- 24.9)	27	40	12	36.67	39	39
Overweight (25-29.9)	23	34	11	33.33	34	34
Obese (> 30)	18	26	9	30	27	27
Hyperprolactinemia	8	11.76	5	15.62	13	13
Hypothyroidism	6	8.82	4	12.50	10	10
FSH levels						
<10	59	87%	22	69%	82	82
11-15	4	6%	5	16%	8	8
16-20	4	6%	5	16%	9	9
>20	1	1%	0	0%	1	1

In present study 39 infertile women had normal BMI. 34 were over weight,

27 infertile women were obese of which 18 were primary and 9 were secondary infertile women. In present study hyperprolactinemia was found to be leading endocrinological abnormality. 13 infertile women had hyperprolactinemia of which 8 were primary and 5 secondary infertile women.

Table 4: Distribution of Menstrual pattern in infertile women

Menstrual pattern	Primary (68)	Secondary (32)	Total (100)
	No.	No.	No.
Regular	28	14	42
Hypomenorrhea	15	4	19
Oligomenorrhea	17	6	23
Amenorrhea	3	2	5
Polymenorrhea	2	3	5
Menorrhagia	3	3	6

Table 5: Distribution of sonologically identified uterine and ovarian abnormalities in infertile women

Sonologically identified uterine abnormalities	Primary (n=68)		Secondary (n=32)		Total (n=100)	
	No.	%	No.	%	No.	%
Hypoplastic Uterus	1	25%	0	0%	1	1%
Mullerian Anomalies	1	25%	1	3%	2	2%
Fibroid Uterus	2	50%	1	3%	3	3%
Total	4	5.88%	2	6.25%	6	6%
Sonologically identified ovarian abnormalities						
PCOS	12	71%	3	50%	15	65.22
Single ovarian cyst	4	24%	1	17%	5	21.74
Complex ovarian cyst	1	6%	2	33%	3	13.04
Total	17	100%	6	100%	23	100.00
Endometrial thickness						
ET< 7mm	58	85%	25	78%	83	83%
ET >7mm	10	15%	7	22%	17	17%
	68		32		100	

In present study, uterine factors accounted for 6% of infertility cases. Mullerian Anomalies were found in 1case of Primary Infertile women (UTREUS DIDELPHYS) and 1 case of secondary Infertile women. i.e. Previous history of abortion was diagnosed to have underdeveloped right horn of uterus.

Table 6: Distribution of HSG and Hysteroscopic findings

Results	Primary		Secondary		Total	
	68		32		100	
	No	%	No	%	No	%
B/L positive	45	66%	15	47%	60	60
U//L tubal block	8	12%	5	16%	13	13
B/L tubal block	9	13%	7	22%	16	15
Uterine filling defects	3	4%	2	6%	5	5
Uterine abnormalities	1	1%	1	3%	2	2
TB salpingitis	1	1%	0	0%	1	1
Fimbrial end adhesions	1	1%	2	6%	3	3
Congenital tubal	0	0	0	0	0	0
Hysteroscopic findings						
Uterine septum	2	2.94%	0		2	2%
Leiomyoma	2	2.94%	2	6.25%	4	4%
Endometrial polyp	2	2.94%	1	3.12%	3	3%
Uterine synechiae	6	8.82%	8 (	25%	14	14%
Total	12	17.65%	11	34.37%	23	23%

23 (33.82%) primary, 17 (53%) secondary infertile women had abnormal HSG findings. Most common being B/L tubal block,which contributes 15%,in this 13% primary nd 22% secondary.

Table 7: Laparoscopically identified causative factors of infertility

Laparoscopically identified causative factors	Primary		Secondary	
	68		32	
	No	%	No	%
Uterine Factors	14	20.59%	5	15.63%
Tubal Factors	15	22.06%	7	21.88%
Ovarian Factors	36	52.94%	13	40.63%
Peritoneal	12	17.65%	9	28.13%
Factors POD Abnormalities	9	13.24%	8	25.00%
Uterine Factors				

Hypoplastic Uterus	1	10%	0	0%
Mullerian Anomalies	2	20%	0	0%
Fibroid Uterus	2	20%	2	50%
Endometriotic	4	40%	1	25%
Acutely R/V	1	10%	1	25%
Total	10	100%	4	100%
Ovarian factors				
PCO	26	72%	10	77%
Streak Ovaries	1	3%	0	0%
Chocolate Cysts	2	6%	0	0%
Functional Cysts/simple	6	17%	2	15%
Complex Ovarian Cysts	1	3%	1	8%
Total	36	100%	13	100%
Tubal factors				
Hydrosalpinx	1	6.67%	0	0%
U/L tubal block	4	26.67%	1	14%
B/L tubal block	6	40%	2	29%
TO mass	1	6.67%	0	0%
Peritubal adhesions	3	20%	4	57%
Total	15	22%	7	22%
Peritoneal Factors				
Endometriosis	6	50%	1	11%
Pelvic Adhesions	5	42%	7	78%
Tuberculosis	1	8%	1	11%
Total	12	18%	9	28%

Ovarian factors contributed to 49% of the cases in which laparoscopy was performed. 36% of primary and 13% of secondary infertility was caused by ovarian factors.

In both groups (primary - 72%, secondary - 77%) and PCOS was the leading ovarian factor responsible for infertility In present study, tubal factors were responsible for 22% primary and secondary infertility cases. Among them a total 1 hydrosalpinx case was there.

Out 5 cases of U/L blocks were 4 were primaryand secondary was 1.

Out of 8 cases of B/L tubal blocks, 6 were primary and 2 were secondary infertile. Uterine abnormalities contributing to 14% of total cases in which laparoscopy was performed. Peritoneal factors accounted for 21% cases of infertility. In that 18% primary and 28% secondary infertility cases. Among peritoneal factors , pelvic adhesions was found to be the leading factor.

Table 8: Results of Chromopertubation Test

Results of Chromopertubation Test	Primary(68)		Secondary(32)		Total(100)	
	No.	%	No.	%	No.	%
B/L positive	51	75%	19	59%	70	70%
B/L Negative	8	12%	6	19%	14	14%
U/L positive	9	13%	7	22%	16	16%
Total	68		32		100	

Majority of Infertility patients (70%) had B/L positive chromopertubation. Bilateral negative dye test was seen in 14% cases.

DISCUSSION

The incidence of primary infertility was 68% and secondary infertility was 32% which correlates with Kaur. et .al,[6] Nassima. et.al,[7] Tatal Naz. et. Al,[8] with primary infertility was 56%, 71% and 70.4% % and secondary infertility was 44%, 28% and 29.5%

Majority of primary infertile women belongs to age group of 20-25 (57%) secondary infertile women were belongs to 26-30 (41%) in our study. Moumita Pal et.al,[9] observed maximum primary infertile women (33.9%) were in the age group of 21-25 years and secondary infertility was high (31.7%) among 26-30 years age group. Mean age is 29.74+/- 5.9. Namitha Ag. et.al[10] showed 27.72+/- 3.82 and Hassan K. et.al,[11] 26.6+/- 3.17.

Table 9: Duration of Infertility

	Kaur.et.al[6] (n 39)		Present Study (n 100)	
Duration of Infertility	**Primary**	**Secondary**	**Primary**	**Secondary**
(in years)	No.	No.	No.	No.
1-5	50% (11)	76.4%(13)	57%(39)	47%(15)
6-10	40.9% (9)	17.6%(3)	34%(23)	34%(11)
11-15	4.5% (1)	-	6%(4)	13%(4)
16-20	4.5% (1)	5.8%(1)	3%(2)	6%(2)
Total	100% (22)	100% (17)	100%(68)	100%(32)

The relationship was statistically significant and indicated that in Greece,[12] about 45 per cent of the cases of secondary infertility may be attributable to previous induced abortions, which is similar our study (59%).

Santhosh. et. Al,[13] noticed in his study that most of the infertile women 93/120 (77.5%) and control 68/80 (85%) were euthyroid. The prevalence of hyperthyroidism in the cases and the controls were 5/120 (4%) and 6/80 (7.5%), respectively. Hypothyroidism was seen in 22/120 (18%) of the infertile women whereas in the control group it was found to be 6/80 (7.5%). The crude prevalence of hypothyroidism was higher when compared to hyperthyroidism in the infertile group.

In our study the euthyroid are 90% (90/100), 6 cases of primary infertility, and 4 cases of secondary infertile are had hypothyroidism. None had Hyperthyroidism. Haifa A.Al-Turki et.al,[14] noticed that the mean follicle-stimulating hormone (FSH) level was 5.91 ± 3.56 IU/L and the Follicle stimulating hormone (FSH) 6.06 ± 3.75 (Primary infertility) & 5.3 ± 2.66(Secondary infertility) 0.001 (<1.0318)(95% CI of difference)). But in our study 1 case of primary infertility had FSH >20 IU/ml.

With Avasthi. et. Al,[15] ncidence of hyperprolactinemia (>25 mg/mL) was 46% (51/111) overall, and 49% (33/67) and 40% (18/44) in the primary and secondary infertility groups respectively. but our study we found less incidence of hyperprolactinemia. (11.76% primary & 15.62% Secondary infertility).

Table 10: Sonographic Evaluation

USG study findings	Nafeesa. et.al[16]	Present study
PCO (Polycystic Ovaries)	69(69%)	65.22%
Chronic pelvic inflammatory disease	14(14%)	6%
Fibroids	6(6%)	3%
Anatomical problems: Present	19(19%)	2%
Endometrial/Cervical polyp: Present	18(18%)	9%
Free fluid in pelvic/abdominal cavity: Present	7(7%)	10%
Endometriosis	4(4%)	7%
Chocolate cyst	8(8%)	4%
hydrosalpinx	2(2%)	1%
Tubo-Ovarian mass	2(2%)	-
Septate uterus	2(2%)	2%

Table 11: HSG Evaluation and Laparoscopic organ abnormality with other studies

HSG	Present study		Kwan.et.al[17]	
	Primary	Secondary	Primary	Secondary
B/L positive	66%(45)	47%(15)	67.3%(287)	46%(75)
U//L tubal block	12%(8)	16%(5)	12.20%(52)	15.95%(26)
B/L tubal block	13%(9)	22% (7)	5.39% (23)	25.76%(42)
Uterine filling defects	4%(3)	6%(2)	9.38%(47)	4.29%(10)
Laparoscopic organ abnormality	**Present study**		**Namita Agarwal et al[10]**	
Ovarian Abn.	36/68(52.94%)	13/32(40.63%)	54/93 (58.4%)	24/64 (37.5%)
Fallopian tube Abn.	15/68(22.05%)	7/32(21.88%)	20/93 (21.5%)	14/64 (21.8%)
Uterine Abn.	14/68(20.59%)	5/32(15.63%)	20/93 (21.5%)	10/64 (15.6%)
Adhesions	12/68(17.65%)	9/32(28.13%)	20/93 (21.5%)	17/64 (26.6%)
POD Abn.	9/68(13.24%)	8/32(25%)	33/93 (35.5%)	15/64 (23.4%)

CONCLUSION

Our study concluded that all the clinical, harmonal, sonological and laproscopic findings are required in evaluation of all infertile patients. It will also be possible in formulating a specific plan of management and segregate the patients who will need ART at the earliest, thus avoiding further emotional and financial trauma to the couples. Our study is observational study in nature with limited sample size hence we suggest more studies in this aspect of infertility.

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