FEMALE INFERTILITY;
A STUDY OF SOCIO-DEMOGRAPHIC AND ETIOLOGICAL PROFILE IN ABBOTTABAD

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ABSTRACT… Objectives: To find the prevalence and etiology of female infertility as well as to study the associated biochemical abnormalities. **Place and Duration of Study:** Department of Gynecology, Frontier Medical & Dental College, Abbottabad, from July 2016 to June 2017. **Study Design:** Case-control study. **Materials & Methods:** All married patients between the ages of 18-35 years were included in the study. Sixty patients who met eligibility criteria were included in one group while sixty normal healthy individuals were included in the second group as controls. Detailed history was taken focusing specifically on age and duration of marriage, menstrual and sexual history and drug history especially use of contraceptives. A thorough clinical examination was performed by an experienced clinician and body mass index was calculated. Laboratory investigations included complete blood examination, hormonal assays, ultrasonography in female patients and semen analysis in male partners. Tubal patency was assessed by hysterosalpingography and laparoscopy was performed, if required. **Results:** The mean age of infertile patients was 27.4±4.9 years and mean duration of their marriage was 6.6±2.9 years. Majority of patients in our study belonged to lower socio-economic status in both groups. About 50% belonged to lower and 16.67% to poor socio-economic group among infertile subjects while 60% belonged to lower and 10% to poor socio-economic group among controls. The chief presenting complaint was oligomenorrhea followed by galactorrhea and dyspareunia. The chief underlying condition was luteal phase deficiency, 60%, followed by hyperprolactinemia, 16.66%, and polycystic ovarian disease, 10%, fibroid uterus, 6.7%, and endometriosis, 6.7%. The serum estradiol levels were 114.6±48.7pg/ml and 233.2±70.8 pg/ml in follicular and luteal phase among infertile couples. Similarly, serum progesterone, serum prolactin, serum FSH and LH levels were 3.6±4.2 ng/ml, 18.1±12 ng/ml, 6.7±2.7 mIU/ml, and 7±6.6 mIU/ml among infertile patients respectively. Serum estradiol and prolactin levels were significantly higher among infertile patients. **Conclusion:** Infertility is not a very uncommon condition in our country. It is the need of time to increase awareness and educate masses about infertility as well as establish infertility clinics for early detection and treatment of infertile couples. Large scale multi-centric studies should also be conducted to accurately estimate the prevalence and etiology of infertility in our region.

Key words: Infertility, Etiology, Female.

INTRODUCTION

Infertility is a common clinical condition and a key health issue globally.[1] It is estimated that infertility affects 50 to 80 million couples worldwide.[2] The prevalence of infertility is reported to be 05 to 25.7% while mean incidence among developed nations is believed to be 3.5 to 16.7% while it is believed to be 6.9 to 9.3% in developing nations.[1,3] The estimated incidence of infertility among South Asian countries were 05% in Pakistan, 04% in Bangladesh and 06% in Nepal.[4,5] Infertility is labeled as a global health issue by World Health Organization which does not receive adequate attention which it deserves.[3]

Infertility is defined as failure to conceive and have a child after having regular sexual intercourse for more than one year and in the absence of any contraceptive measures.[6] Primary infertility refers to being unable to conceive at all while secondary infertility refers to being unable to conceive after a previous pregnancy.[4,7] Prevalence of infertility

is variable and depends upon numerous factors. Socioeconomic, cultural and environmental factors are some of them which play an important role in causation of infertility.[4,8]

Being a childless put enormous pressure on social, physical and mental well-being of a person, chiefly women.[9] Relationships among couples and families become constrained because of not having children and this leads to disappointment and a feeling of failure, loss and then seclusion and loneliness for infertile people.[2,10] This is because children are believed to play an important and active role in the care of their elderly family members as well as to continue their lineage.[2,5,11]

This study is conducted to find the prevalence and etiology of female infertility as well as to study the associated biochemical abnormalities in infertile patients.

MATERIALS & METHODS

This was a case-control study which was performed in the Department of Gynecology, Frontier medical & Dental College, Abbottabad, from July 2016 to June 2017. All those patients who were married and trying to conceive for more than one year and not using any form of contraception, who were between the age of 18-35 years and who were willing to participate were included in the study. All the patients who were married for less than an year or whose husbands are working overseas or who were suffering from gynecological malignancy or already taking treatment for infertility were excluded from the study. Sixty patients who meet eligibility criteria were included in one group while sixty normal healthy individuals were included in second group as controls. Controls were matched for age within ± 5 years and were those who lived in the neighborhood of the patients. Detailed history was taken focusing specifically on age, duration of marriage, menstrual and sexual history and drug history especially use of contraceptives. A thorough clinical examination was performed by an experienced clinician and height and weight were measured so as to compute body mass index (BMI). Laboratory investigations included complete blood examination, hormonal assays

(luteinizing hormone (LH), follicle-stimulating hormone (FSH), estradiol and prolactin levels) and ultrasonography (for ovulation) in female patients and semen analysis in male partners. Tubal patency was checked using hysterosalpingography and laparoscopy was performed when required. The data was managed and analyzed using SPSS version 21. P value of less than 0.5 was considered significant.

RESULTS

The base-line characteristics of the study subjects are given in Table-I. The mean age of infertile patients was 27.4 ± 4.9 years and mean duration of their marriage was 6.6 ± 2.9 years.

Variable	Infertile, (n = 60)	Fertile, (n = 60)
Age:	27.4 ± 4.9 years Range: (19-35 years)	28.1 ± 7 years (19-35 years)
BMI:	24.9 ± 2.8 kg/m^2 Range: (21-36kg/m^2)	25.2 ± 2.3 kg/m^2 (20-30kg/m^2)
Duration of Marriage:	6.6 ± 2.9 years Range: (3 – 15 years)	6.9 ± 4.2 years (2.5 – 17 years)
Table-I. Baseline characteristics of study subjects, (n=120)		

Table-II delineates the socio-economic status of our study subjects. Majority of patients in our study belonged to lower socio-economic status in both groups. About 50% belonged to lower and 16.67% to poor socio-economic group among infertile subjects while 60% belonged to lower and 10% to poor socio-economic group among controls. Only 16.66% belonged to upper class among infertile patients and 18.33% among control subjects.

Variable	Infertile, (n = 60)	Fertile, (n = 60)
Poor	10, 16.67%	06, 10%
Lower	30, 50%	36, 60%
Middle	10, 16.67%	07,11.67%
Upper	10, 16.66%	11, 18.33%
Total	60, 100%	60, 100%
Table-II. Social status of study subjects, (n=120)		

Clinical complaints of infertile patients are shown in Table-III. The chief presenting complaint was oligomenorrhea followed by galactorrhea and dyspareunia which were observed in 33.3%, 20%

and 16.7% patients respectively.

Symptom	No, Percentage
Oligomenorrhea	20, 33.3%
Galactorrhea	12, 20%
Dyspareunia	10, 16.7%
Dysmenorrhea	8, 13.3%
Amenorrhea	6, 10%
Menorrhagia	4, 6.7%
Total	60, 100%

Table-III. Clinical features of infertile patients, (n = 60)

Table-IV outlines the chief clinical conditions present in infertile patients. The primary condition was luteal phase deficiency, 60%, followed by hyperprolactinemia, 16.66%, and polycystic ovarian disease, 10%, fibroid uterus, 6.7% and endometriosis in 6.7%.

Clinical condition	No, Percentage
Luteal phase deficiency	36, 60%
Hyperprolactinemia	10, 16.66%
Polycystic ovarian disease	6, 10%
Fibroid uterus	4, 6.7%
Endometriosis	4, 6.7%
Total	60, 100%

Table-IV. Clinical disorders diagnosed in infertile patients, (n = 60)

The hormonal profile of both infertile patients and controls is given in Table-V. The serum estradiol levels were 114.6 ± 48.7 pg/ml and 233.2 ± 70.8 pg/ml in follicular and luteal phase among infertile couples. Similarly, serum progesterone, serum prolactin, serum FSH and LH levels were 3.6 ± 4.2 ng/ml, 18.1 ± 12 ng/ml, 6.7 ± 2.7 mIU/ml, and 7 ± 6.6 mIU/ml among infertile patients respectively. Serum estradiol and prolactin levels were significantly higher among infertile patients.

Hormone	Infertile, (n = 60)	Fertile, (n = 60)
Serum Estradiol:		
Follicular Phase	114.6 ± 48.7 pg/ml*	87.6 ± 28 pg/ml*
Luteal phase	233.2 ± 70.8 pg/ml*	186.1 ± 63.7 pg/ml*
Serum Progesterone:	3.6 ± 4.2 ng/ml	3.2 ± 3.0 ng/ml
Serum Prolactin:	18.1 ± 12 ng/ml*	11.9 ± 4.7 ng/ml*
Serum FSH:	6.7 ± 2.7 mIU/ml*	8.9 ± 3.3 mIU/ml*
Serum LH:	7 ± 6.6 mIU/ml*	12.5 ± 7 mIU/ml*
Table-V. Hormonal profile of study subjects, (n=120) $*p < 0.05$		

DISCUSSION

Infertility is a key problem that affects the health and well-being of individuals and societies alike. The prevalence of infertility is different among different populations and changes over time. The knowledge of exact rate and causes of infertility is pivotal these days as numerous modern techniques and facilities are available nowadays which can help infertile couples.[6]

In our study, the mean age of infertile patients was 27.4 ± 4.9 years, BMI was 24.9 ± 2.8 kg/m² and mean duration of marriage was 6.6 ± 2.9 years. Our findings are comparable to other studies. Anwar et al have conducted their study in Bangladesh. The mean age of their study subjects was 27.7 ± 3.46 years, mean duration of marriage was 4.3 ± 0.46 years and their BMI was 23.16 ± 1.08 kg/m².[8] According to Omu et al, the mean age of their Kuwaiti patients was 29.9 ± 5.4 years and the average duration of marriage was 5.3 ± 4.0 years.[12] Haifa Al-Turki has also reported that the mean age of their Saudi Arabian infertile patients was 33.38 ± 5.39 years and mean duration of marriage was 5.4 years.[3] Similarly, Masoumi et al have reported that the mean duration of marriage was five years among their Iranian subjects.[1] In another Iranian study by Malekshah et al, the mean duration of marriage of infertile couples was found to be 5.7 ± 4 years.[13] The slightly longer duration of marriage that we have found in our study could be due to the fact that married couples usually delay in seeking medical help. The reason for this delay might be the fact that being a developing country, infertility treatment is not only expensive but also available

at specialized centers which everybody cannot afford and do not have access too.

Majority of patients in our study belonged to lower socio-economic status in both groups. About 50% belonged to lower and 16.67% to poor socio-economic group among infertile subjects while 60% belonged to lower and 10% to poor socio-economic group among controls. Only 16.66% belonged to upper class among infertile patients and 18.33% among controls. Aflatoonian et al, in their study which was conducted in Yazd, Iran, reported that 2.2% of their infertile patients belonged to lower socio-economic status while 2.7% belonged to middle and 0.4% to higher socioeconomic status. This discrepancy in the results could be due to the fact that Aflatoonian et al have performed their study in both rural and urban setup while our study was conducted in an urban setting. Furthermore, we have performed this study in a government hospital and these hospitals usually cater to the needs of middle to poor class people. Moreover, government hospitals are not considered to be of good quality by many and those people who can afford prefer private hospitals for seeking treatment for their ailments.[14]

In our study, primary underlying cause responsible for infertility was luteal phase deficiency (60%) followed by hyperprolactinemia (16.66%), polycystic ovarian disease (10%), fibroid uterus (6.7%) and endometriosis (6.7%). In a similar study conducted in Bangladesh by Sultana et al, primary cause of infertility in their female subjects was ovarian dysfunction (60%) followed by polycystic ovarian disease (32%), hyperprolactinemia (16%) and endometriosis (10%).[4] Similarly, Omu et al have found that ovarian dysfunction was responsible for infertility in 40.7% of their patients and endometriosis in 5.6% cases.[12] Likewise, chief causes of infertility were an ovulation (25.7%) and uterine factors (8.7%)according to Dovom et al.[15] An ovulation was also the main reason for female infertility as described by Thonneau et al.[16] This discrepancy in causes of infertility could be due to the different geographical location as well as different religious, socio-economic and racial factors and beliefs affecting fertility in these regions.

Serum estradiol and prolactin levels were significantly higher among infertile patients in our study. The serum estradiol levels were 114.6±48.7pg/ml and 233.2±70.8 pg/ml in follicular and luteal phase whereas serum progesterone, serum FSH, LH and serum prolactin levels were 3.6±4.2 ng/ml, 6.7±2.7 mIU/ml, 7±6.6 mIU/ml and 18.1±12 ng/ml among infertile patients respectively. According to a study conducted by Haifa Al-Turki in Saudi Arabia, mean FSH, LH and prolactin levels were 5.91 ± 3.56 IU/L, 4.61 ± 2.11 IU/L and 18.4 ± 8.35 lg/L respectively.[3] Similarly, the median values of serum prolactin, FSH and LH were reported to be 342 mIU/l, 6.4 IU/l and 6.2 IU/l by Omu et al among their Kuwait patients.[12] The difference in the values of these hormones between our and the study conducted by Omu et al could be due to the fact that we have calculated mean values of these hormones and Omu et al have reported median values of these hormone.

CONCLUSION
Infertility is not a very uncommon condition in our country. It is the need of time to increase awareness and educate masses about infertility as well as establish infertility clinics for early detection and treatment of infertile couples. Large scale multi-centric studies should also be conducted to accurately estimate the prevalence as well as causes of infertility in this region.
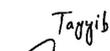**Copyright© 15 Dec, 2017.**

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PREVIOUS RELATED STUDY

Kalsoom Akhtar, Mohammad Anees, Naeem Ahmed Laghri, Mohammad Iftikhar Alam, Farzana Kousar. Female infertility; comparison of hysterosalpingoscintigraphy (hssg) and laparoscopy (Original) Prof Med Jour 14(2) 276-285 Apr, May, Jun, 2007.

AUTHORSHIP AND CONTRIBUTION DECLARATION

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1	Muhammad Tayyab	Conceived the idea, Supervised & Proof-read the manuscript.	
2	SurriyaYasmin	Designed and performed study, Gathered and analyzed data.	
3	M. Usman Anjum	Written manuscript, Statistical analysis	