

Causes of Infertility

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Background: Infertility is found to be a major social and clinical problem, affecting 1 in 6 couples. Infertility should be diagnosed if a couple has tried natural, regular unprotected intercourse for twelve months without conceiving. Causes of infertility can be classified according to genders in which a male factor can be represented by sperm abnormalities while female factors may include anovulation, tubal pathology, in addition to combined female and male factors; furthermore, unexplained infertility would be the cause if all factors are normal after investigations.

Objective: To evaluate the most common causes of infertility from 2015-2016.

Design: A Retrospective Study.

Setting: Assisted Conception Clinic (ACC), Salmaniya Medical Complex, Bahrain.

Method: Four hundred forty-one Bahraini patients diagnosed with infertility between years of 2015-2016 were included in the study. The data were documented from patients' records using predesigned data collection forms.

Result: The mean duration of infertility was 5.02 years with a mean female age of 33.5 years. Secondary causes of infertility were found in 227 (51.5%) patients and primary causes in 214 (48.5%). Female causes were found in 252 (57%) and males causes in 77 (17.5%); causes in both male and female were found in 20 (4.5%). Unexplained causes found in 92 (20.8%). The major cause of females' infertility was anovulation, which includes Polycystic Ovarian Syndrome (PCOS), was found in 88 (20%), while Endometriosis was the least common cause, 8 (1.8%). Seventy-three (16.5%) had abnormal sperm analysis. One (0.2%) patient had abnormal Karyotyping.

Conclusion: The mean duration of infertility was 5.02 years with a mean female age of 33.5 years. Female causes were 252 (57%); anovulation was the main cause. Male causes were found in 77 (17.5%). Secondary causes of infertility were found in 227 patients (51.5%) and primary causes in 214 (48.5%).

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Infertility has always been an issue of concern for humans. Infertility is defined as the inability to conceive after 12 months of natural unprotected intercourse regardless of the cause¹. Infertility affects roughly ten to fifteen percent (10-15%) of couples in the reproductive age group². Infertility causes are classified according to male/female and both genders.

Female factors that affect fertility include the following categories: anatomical abnormalities, cervical stenosis, menstrual cycle irregularity, fallopian tube deformities, congenital abnormalities, acquired defects including fibroids and others, anatomic defects and physiologic dysfunctions such as infection, adhesions, adnexal masses, uncontrolled hypo/hyperthyroidism, hypertension, obesity, diabetes and others³⁻⁴.

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Male factors that affect fertility include the following categories: acquired diseases of the pituitary gland, hypothalamus, or other organs affecting the hypothalamic-pituitary axis, genetic causes, factors disrupting normal transportation of sperm in the ductal system³.

Factors affecting fertility in both genders include the following: advanced reproductive age, environmental and occupational factors, toxic effects related to smoking or drug abuse, excessive exercise, deficient diet associated with extreme weight loss or gain⁵.

There are unexplained causes of infertility in both genders in which the couples investigate themselves after one year of marriage without conceiving and all their investigations are normal, yet they cannot conceive.

The aim of this study is to evaluate the most common cause of infertility from 2015 to 2016.

METHOD

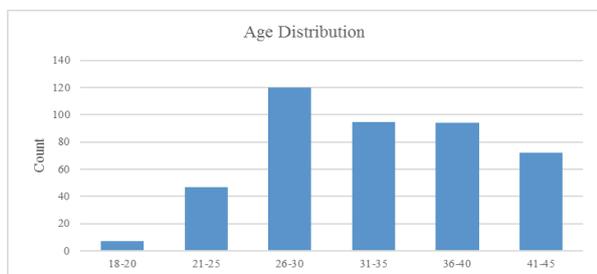
All patients diagnosed as infertile during the period 2015-2016 and undergoing treatment were included in the study. The inclusion criteria were Bahraini, both genders, ages 18-45. The exclusion criteria were non-Bahrainis, patients below 18 or above 45 years of age, missed or incomplete records.

We developed our own Data Collection Sheet. All data were collected from the hospital's patients' records from 26 May 2017 to 16 June 2017.

The design of the data collection sheet included fields for every variable. The following were documented: nationality, age, years of marriage, medical condition, and primary or secondary causes. All data were entered using SPSS. The data were analyzed using Excel program.

RESULT

A total of 441 infertile patients from 2015 to 2016 were included in the study. The age ranged from 18 to 45; the youngest patient was 18 years old and the eldest was 45, (with a mean of 33.5 years). The majority of the cases were between 26-30 years old. The patients' ages were grouped into 6 categories, see figure 1. Female causes were 252 (57%) and male causes were 77 (17.5%), causes in both genders were in 20 (4.5%) and unexplained causes were in 92 (21%), see figure 2.



Mean Age: 33.5

Figure 1: Age Distribution

Primary and secondary causes of infertility in both genders were almost equal; secondary causes were seen in 227 (51.5%) and primary were seen in 214 (48.5%), see figure 3.

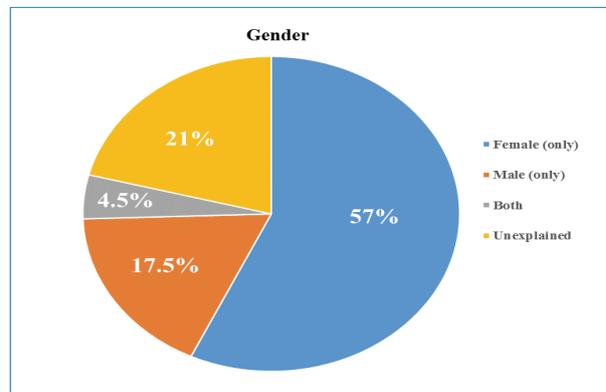


Figure 2: Gender Distribution

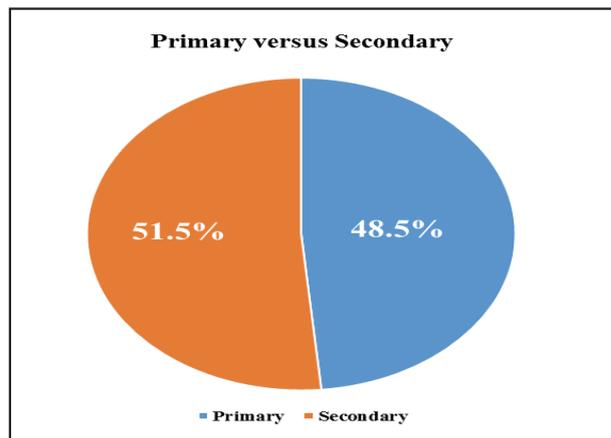


Figure 3: Primary versus Secondary Causes of Infertility

Twenty-four (5.4%) females were diagnosed as infertile due to advanced reproductive age and another 24 (5.4%) had decreased ovarian reserve (DOR). Only 8 (1.8%) patients were diagnosed with endometriosis, whereas the main cause of infertility in females was anovulation because of polycystic ovary syndrome (PCOS), 88 (20%) cases, see figure 4.

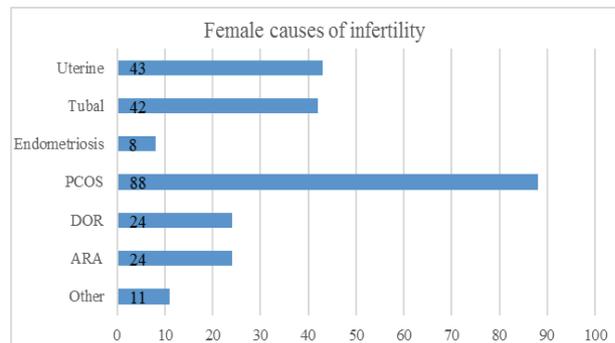


Figure 4: Female Causes of Infertility

Seventy-three (16.5%) had abnormal sperm analysis. Three (0.7%) patients had sexual dysfunction including erection problems, impotence and ejaculation. One (0.2%) patient had abnormal Karyotyping, see figure 5.

Eighty-eight (20%) patients were infertile because of anovulation. Forty-three (9.7%) patients had uterine causes including fibroids, endometrial causes, and uterine abnormalities.

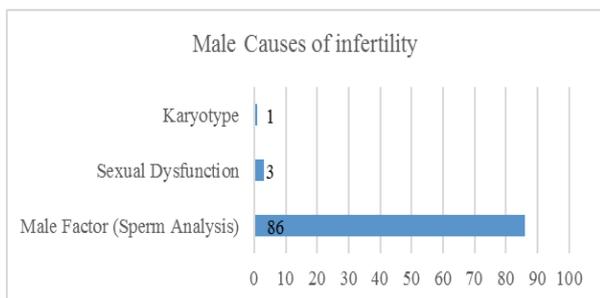


Figure 5: Male Causes of Infertility

DISCUSSION

The findings of this study are similar to World Health Organization (WHO) study of 8,500 infertile couples, where 37% of infertility cases were due to female factors, pure male factor was 8% and 35% was due to a combination of both male and female factors⁶.

Any disturbances in the menstrual cycle due to single or multiple causes, such as damage to fallopian tubes or uterus, or problems with the cervix may lead to infertility⁷. According to the WHO, ovulation problems contribute to approximately 25% of infertility causes which could be congenital, anatomical as in fallopian tubes obstruction, pathological problems such as endometriosis, pelvic inflammatory disease and chlamydia^{8,9}. In this study, we found that unexplained causes in 74 females. The American Society for Reproductive Medicine reported that approximately 5 to 10 percent of couples' infertility is due to unexplained causes¹⁰.

Investigating female fertility could be by hormonal assay, ultrasound, hysterosalpingography (HSG)¹¹. Sonohysterogram combines ultrasound and saline injected into the uterus to look for abnormalities¹¹⁻¹³.

A study found that at least 30 million men worldwide are infertile and the highest rates in Africa and Eastern Europe¹⁴. In our study, 17.5% of infertility is caused by male factors, while in another it was approximately 30%¹². Infertility in men can be caused by different factors and is typically evaluated by semen analysis^{6,15}. Semen analysis is performed to assess the number of sperm (concentration), motility (movement), and morphology (shape). Infertility in men can be classified into disruption of testicular or ejaculatory function, hormonal disorders, and genetic disorders¹⁶. Additional tests could be used, such as scrotal ultrasound, hormonal testing, post-ejaculation urine analysis or retrograde ejaculation, testicular biopsy, and genetic testing¹⁵.

In this study, the primary causes were 48.5% and the secondary causes were 51.5%. These findings are different compared to a study conducted in Saudi Arabia which concluded that the primary infertility is 80.5% while secondary causes are only 20%⁹. Similar findings were found in another study conducted in Iran¹⁷. Multiple factors might increase the risk of infertility in both genders such as age, drugs and alcohol. Other factors such as smoking constitute a risk of 13% in females and overweight in 12%¹⁸.

According to the society of reproductive surgeons, 25% of infertile couples have more than one factor; therefore, studying

patients with more than one factor for infertility would help in diagnosing and treating the underlying cause⁶.

In our study, few factors that limited our findings and our ability to effectively conduct this study and answer our hypotheses. One of the important limitations in our research was the small sample size.

In addition, the missing data limited the scope of our analysis. Some of the patient records information was missing such as male factor infertility.

CONCLUSION

The study found that the mean duration of infertility is 5.02 years with mean age of 33.5. Secondary causes of infertility were found in 227 patients out of 441 and the primary causes found in 214.

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Competing Interest: None.

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REFERENCES

- Huhtaniemi I. Encyclopedia of Endocrine Diseases. Second Edition. Volume 2. United States: Academic Press, 2019: 490-497.
- Agarwal A, Mulgund A, Hamada A, et al. A Unique View on Male Infertility Around the Globe. *Reprod Biol Endocrinol* 2015; 13: 37.
- Puscheck EE. Infertility. *Medscape* 2016. <https://emedicine.medscape.com/article/274143-overview> Accessed in April 2017.
- Abrao MS, Muzii L, Marana R. Anatomical Causes of Female Infertility and Their Management. *Int J Gynaecol Obstet* 2013; 123 Suppl 2:S18-24.
- Garcia JE. Infertility. *Emedicine Health* 2018. https://www.emedicinehealth.com/infertility/article_em.htm#facts_about_infertility Accessed 17 October 2018.
- WHO Technical Report Series. Recent Advances in Medically Assisted Conception Number 820, 1992; 1-111.
- Centers for Disease Control and Prevention. Infertility FAQs. <https://www.cdc.gov/reproductivehealth/infertility/index.htm> Accessed in August 2017.
- Brugo-Olmedo S, Chillik C, Kopelman S, et al. Definition and Causes of Infertility. *Reprod Biomed Online* 2001;2(1):41-53.

9. Kamel RM. Screening for Chlamydia Trachomatis Infection among Infertile Women in Saudi Arabia. *Int J Womens Health* 2013; 5:277-84.
10. American Society for Reproductive Medicine. FAQs About Infertility. <http://www.reproductivefacts.org/faqs/frequently-asked-questions-about-infertility/> Accessed in July 2017.
11. Valle RF. Hysteroscopy in the Evaluation of Female Infertility. *American Journal of Obstetrics and Gynecology* 1980; 137(4): 425-431.
12. Fertility: Assessment and Treatment for People with Fertility Problems. Royal College of Obstetricians & Gynaecologists; 2013.
13. Hanson B, Johnstone E, Dorais J, et al. Female Infertility, Infertility-Associated Diagnoses, and Comorbidities: A Review. *J Assist Reprod Genet* 2017;34(2):167-177.
14. Coskuna S, Alazamia AM, Mahmouda S, et al. Mutation in Subcortical Maternal Complex Member Protein TLE6 causes Female Infertility in Humans. *Fertility and Sterility* 2013; 104(3): e202.
15. Mayo Clinic. Male Infertility. <https://www.mayoclinic.org/diseases-conditions/male-infertility/symptoms-causes/syc-20374773> Accessed in August 2017.
16. NICHD Information Resource Center. How Common is Male Infertility, and What Are its Causes? <https://www.nichd.nih.gov/health/topics/menshealth/conditioninfo/infertility> Accessed in April 2017.
17. Masoumi SZ, Parsa P, Darvish N, et al. An Epidemiologic Survey on the Causes of Infertility in Patients Referred to Infertility Center in Fatemeh Hospital in Hamadan. *Iran J Reprod Med* 2015; 13(8): 513–516.
18. Society of Reproductive Surgeons. FAQ Quick Facts About Infertility. <http://connect.asrm.org/srs/about/new-item9?ssopc=1> Accessed in May 2017.