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The Pattern of Infertility Among Infertile Couples Visiting Kairuki Hospital Green IVF: A Retrospective Study

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Abstract

Background: *Infertility or childless is a global reproductive health issue for female as well as male sexes yet often not discussed in public and most of the time neglected especially in the African setting.15% of reproductive-aged couples suffer from infertility problems worldwide. This study aimed to evaluate the pattern of infertility among infertile couples visiting Kairuki Hospital Green IVF (Invitro Fertilization) in Tanzania.*

Methods: *A retrospective, descriptive cross-sectional study of infertile couples visiting Kairuki Hospital Green IVF, a busy IVF center serving patients in the Eastern zone, Dar es salaam Tanzania was conducted. The study included information retained from 1st September 2021 to 30th March 2024.Case notes of all eligible couples attending the Hospital during the study period were retrieved from AFYA BOX (Hospital information system) and relevant information was extracted and transferred onto a Microsoft Excel for subsequent computer analysis. Data were analyzed using R (version 4.3.2). Frequencies and Means were used to analyze Quantitative descriptive data.*

Results: *The mean age of women was 38 years, the average BMI (Biomass Index) of women was 29.21Kg/m2, the median distribution of BMI was 29Kg/m2, the highest BMI was 52Kg/m2 and the lowest was 19Kg/m2. For menarche age, the lowest age was 9 years, and the highest was 20 years, Average age of menarche was 13.34 years, and the median was 13 years. The average duration of infertility was 7.48, and the median was 6, The highest duration was 31 years and the lowest was 1 year. The secondary infertility (52%) was the dominant type of infertility. The female factor responsible for infertility was 62.43%. The most common female factor of infertility was tubal factor 46.96%. The most abnormal spermatozoa condition in men was oligospermia 23.89%.*

Conclusion: *Our study revealed that the most common type of infertility is secondary infertility and in females, tubal factor which includes tubal blockage, hydrosalpinx, and peritubal adhesions was the commonest cause of infertility among women. Tubal diseases need to be reduced in our society to minimize infertility conditions among women.*

Keywords: Infertility, Tubal Factor, Male Factor, Kairuki, Tanzania

Introduction

Clinically infertility is defined by WHO (World Health Organization) as a disease of the reproductive system characterized by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse [1, 2]. Infertility affects approximately 60-80 million couples around the world and is still increasing [3]. A demographic study conducted by the WHO on developing countries (except China) in 2002 demonstrated that 186 million women are infertile [4].

The prevalence of current infertility in developed and less developed countries was between 3.5-16.7% and 6.9-9.3% respectively with the prevalence of infertility being 16% in Tanzania [5, 6]. With the advancement of time and technology, both males and females are career-oriented, resulting in the advanced age of marriage, diminished reserve, and many other causes that lead couples to depend on assisted reproductive technology (ART) [7].

In-vitro fertilization (IVF) is a medical procedure where an egg is fertilized by sperm outside the body in a laboratory setting. Assisted reproduction technology includes all the methods used for fertilization, which is not achieved through sexual intercourse. It involves a hormonally controlled ovulatory process and thereafter removal of ova from the woman's ovaries and fertilizing with the husband's or donor's sperm outside the human body, the resulting embryo is then transferred to the patient's uterus to establish a successful pregnancy [8]. Failure may occur at multiple points of the IVF cycle starting from failed fertilization, failed implantation, and early fetal loss due to a decrease of raised human Chorionic Gonadotropin (hCG) level to spontaneous abortion, etc [9].

The use of IVF has increased dramatically over the past 4 decades since the first birth from IVF in 1978, at least 8 million children have been born from IVF-assisted pregnancies worldwide [10]. Even though there is a significant rapid growth still the economic, social, cultural, and structural barriers prevent many patients who struggle with infertility from accessing IVF.

In Africa, there is a complete absence of affordable and accessible ART (Assisted Reproductive Technology) services in some Low- and middle-income countries possibly due to the high costs of IVF and underdeveloped infrastructure in addition to cultural, religious, and legal barriers [11]. Infertility is known to cause significant psychological and social effects, including fear, guilt, depression, self-blame, marital stress, emotional abuse, intimate partner violence, divorce and abandonment of the partner, social isolation, economic deprivation, loss of social status and violence-induced suicide [12].

The success rate of IVF can vary depending on a variety of factors such as the age of the woman the cause of infertility the clinic's success rates, and the specific techniques used [13-15]. In Tanzania, IVF services are limited, with only a few emerging clinics, mainly located in capital cities like Dar es Salaam. Approximately three IVF centers exist, with KAIRUKI Green IVF Hospital being a prominent provider established in 2021.

Methods

This retrospective, descriptive study involved infertile couples attending the KHGIVF (Kairuki Hospital Green IVF), a busy IVF center serving patients in the Eastern zone, Dar es Salaam part of Tanzania. The study included information retained from 1st September 2021 to 30th March 2024. Case notes of all eligible couples attending the IVF center during the study period were retrieved from AFYA BOX (Hospital information system).

Relevant information was extracted and transferred into Microsoft Excel for subsequent computer analysis. Every participant had a unique number for identification and marked to avoid repetition in subsequent days of data collection. In females, various aspects evaluated were sociodemographic characteristics of infertile women such as age, religion, level of education, type of infertility and gynecological characteristics of infertile women including parity, number of children, age at menarche, type of infertility, duration of infertility, female factor such as tubal factor, ovarian factor, uterine factor and unexplained factor data were included. In male factor, spermatozoa conditions including Normozoospermia, Oligospermia, Azoospermia, Asthenozoospermia and oligoasthenozoosepermia were evaluated.

The contribution of various factors such as male factor, female factor and both male and female factor were also evaluated. Data were analyzed using R (version 4.3.2). Frequencies and Means were used to analyze qualitative and Quantitative descriptive data.

Results

Sociodemographic Characteristics Among Infertile Women

A total of 181 couples were reviewed for infertility. The mean age of women was found to be 38 years. The most age group was between 36-40 (51%). Most women are Christian (78%) followed by Islam (22%). The level of education of 86% women was of tertiary level. Forty three percent women had a BMI greater than 30Kgm-2. These sociodemographic characteristics are shown in Table 1.

Table 1: Descriptive Socio-Demographic Characteristics Among Infertile Females.

Characteristics	N = 1811
Mean age of women	38 years.
Age group (years)	
21 - 25	7 (3.9%)
26 - 30	22 (12%)
36 - 40	92 (51%)
41 - 45	36 (20%)
46 - 50	19 (10%)
51 - 55	5 (2.8%)

Religion	
Christian	142 (78%)
Islam	39 (22%)
Level of Education	
Secondary	25 (14%)
Tertiary	156 (86%)
BMI Distribution (Kg/m^2)	
18.5 – 24.9	34(18%)
25.0 - 29.9	69(38.12%)
30.0 - 34.9	53(29.28)
35.0 - 39.9	25(13.81)

1 Mean (SD); n (%)

Gynecological Characteristics of Infertile Women

Fifty-four percent of women had a nulliparous type of parity, followed by Primiparous 25% and least multiparous 21%. Seventy-seven percent of women were experiencing menarche in the age group 13-15, and the eldest age group >15 is 7.7%. Secondary infertility, 94.52%, was the dominant type of infertility. Forty-four percent of women were experiencing 1-5 years of infertility. The gynecological characteristics are shown in Table 2

Table 2. Descriptive Gynecological Characteristics of Infertile Females.

Characteristics	N = 1811
Parity	
Nulliparous	98 (54%)
Primiparous	45 (25%)
Multiparous	38 (21%)
Number of children	
1 -2	34 (19%)
3	5 (2.8%)
None	141 (78%)
Age at Menarche (years)	
9 - 12	27 (15%)
13 - 15	140 (77%)
> 15	14 (7.7%)
Types of Infertility	
Primary	87 (48%)
Secondary	94 (52%)
Duration of Infertility (years)	
1-5	80 (44%)
6-10	55 (30%)
>10	46 (25%)

Etiology of Infertility

The most common female factor of infertility was tubal factor 46.96% followed by uterine factor (30.94%,), ovarian factor (22.1%), male factor (16.57%) and in 3.87% the reason was unexplained. In 181 males, the common spermatozoa condition was normozoospermia was found in 113 subjects (62.78%). Oligospermia was the most common abnormal spermatozoa condition with 23.89% and the least abnormal spermatozoa condition was oligoasthenoterazoospermia with 2.78% among male who visited Kairuki Hospital Green IVF (Table 3).

Table 3. Descriptive Statistics of Etiological Factors Contributing to Infertility.

Etiological factors		
Tubal factor	53(46.96%)	Tubal blockage, Hydrosalpinx, Peritubal adhesions
Uterine factor	35(30.94%)	Uterine fibroids, intrauterine adhesions, septate uterus
Ovarian factor	26(22.1%)	Polycystic ovary syndrome, Hyperprolactinemia

Male factor	29(16.57%)	
Normozoospermia	113(62.78%)	
Oligospermia	44(23.89%)	
Azoospermia	3(1.67%)	
Asthenozoospermia	16(8.89%)	
Oligoasthenoterazoospermia (OAT)	5(2.78%)	
Male and female factor	31(17.14%)	
Unexplained	7(3.87%)	
Male and female factor	31(17.14%)	
Unexplained	7(3.87%)	

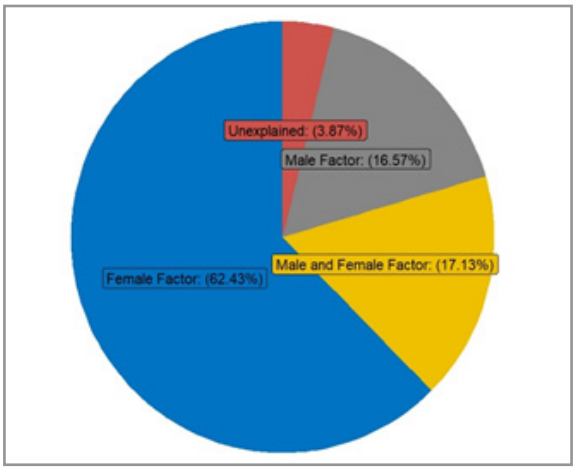

Figure 1: Contribution of Various Factors to Infertility

The different factors contributing to infertility among couples coming to Kairuki Hospital Green IVF were assessed. The study revealed that the female factor contributed 62.43% of infertility whereas the male factor contributed 16.57% of infertility. In 16.57% of cases, both male and female factors contributed to infertility and in 3.87% of cases the unexplained factor was responsible for infertility (Fig 1).

Discussion

Both women and men are affected by infertility. Yet women particularly in developing countries have to bear the blame for the couples without children [16]. A very small number of the population with infertility is getting treated in Tanzania. This study aimed to find the pattern of infertility among couples visiting Kairuki Hospital Green IVF found in Dar es salaam Tanzania. The results of this study show the social demographic factors among infertile women, gynecological characteristics, etiology of infertility and contribution of various factors of infertility.

The study shows that the main portion about 51% of female patients undergoing infertility treatment at Kairuki Hospital was within 36-40 years age group. Many other studies have shown a similar trend that many women visiting their center for IVF treatment are mainly above the age of 36 years this may be due late marriages as well as pregnancy planning [17]. The reasons contributing to decline in conception with an increasing age are also associated with conditions such as uterine fibroids, tubal diseases, endometriosis, and male factor increase with age [18, 19]. As women age, their ovarian reserve (the number and quality of eggs available for fertilization) declines, which can make it harder to conceive [20].

The study shows that 38.12% of women undergoing infertility at Kairuki Hospital Green IVF is between 25.0 - 29.9 kg/m2 BMI. Our study revealed that 43% of women have a BMI greater than 30 Kg/m2 which falls in obese category as per WHO categorization of BMI. Some other studies showed that women with a BMI greater than 30kgm2 have negative impact on Outcome of IVF [21]. Our study showed that 78% of women visiting Kairuki Hospital Green IVF are Christians and 86% of women have tertiary level of Education. The mean duration of infertility was 7.48, normally the mean duration of age correlates with the age of marriage. The most common type of infertility is secondary infertility like many other studies [22].

This may be due to changes in reproductive health conditions like polycystic ovarian syndrome, endometriosis, or uterine fibroids may develop after a previous pregnancy [23]. The complications from prior pregnancy, lifestyle, and environmental factors e.g. weight gain or loss, stress, smoking, alcohol con-

sumption and certain medications or environmental exposures can all affect fertility over time, hormonal changes and sexual transmitted infections (STIs).

The female factor is the leading cause of infertility among the couples in this study. Tubal factor which includes tubal blockage, hydrosalpinx, peritubular adhesions was the most common 46.96% cause of infertility in this study, the percentage is lower compared to other studies [24]. Uterine factors such as, uterine fibroids, intrauterine adhesions, septate uterus contributed to 30.94% cause of infertility. In fact, the role of uterine fibroids in the etiology of infertility is more prevalent [25].

This means that the presence of uterine fibroid is only attributed to infertility when no other cause could be found. The study also showed that most common male factor was oligospermia (23.8%) among181. The contribution of both male and female factors was 17.13%. The contribution of various factors in our study varies from other studies conducted [26-28]. The evaluation of both female as well as male factors contributing to infertility should be considered while devising the infertility treatment. Addressing all these various factors requires comprehensive health policies, greater public awareness, and improved access to infertility care and education.

Conclusion

Our study revealed that the most common type of infertility is secondary infertility and in females, tubal factor which includes tubal blockage, hydrosalpinx, and peritubal adhesions was the commonest cause of infertility among women. Tubal diseases need to be reduced in our society to minimize infertility conditions among women. In tanzania, infertility remains an ignored disease as an increasing population country, the country's health policy needs to emphasize infertility control.

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Authors Contributions

- **L.D.B:** Project development, manuscript writing and submitting.
- **C.A.K:** Patient examination
- **L.K:** Patient examination
- **G.T:** Data gathering.
- **N.I.S:** Data gathering and analysis.
- **S.K:** Project mentor.

All authors read and approved the final manuscript.

Declarations

Funding

No funding resources.

Conflict of Interest

There was no conflict of interest declared.

Ethical Approval

Ethical approval to perform this study was obtained from Hubert Kariuki Memorial University (HKMU) Committee. Additional permission to perform the study was also sought from Kariuki Hospital. Permission to conduct the study was obtained from the administrative authorities of the corresponding institution. Ever since it is the cross-sectional retrospective study and involved secondary data abstraction there was no written informed consents obtained from the patients.

Study Limitation

The study was conducted at one hospital facility; we recommend a large, based population study to be more representative of the findings in a general information.

References

1. Chimbatata, N. B., & Malimba, C. (2016). Infertility in sub-Saharan Africa: A woman's issue for how long? A qualitative review of literature. International Journal of Scientific Research in Environmental Sciences, 4(8), 96-102.
2. Tabong, P. T. N., & Adongo, P. B. (2013). Understanding the social meaning of infertility and childbearing: A qualitative study of the perception of childbearing and childlessness in Northern Ghana. PLoS ONE, 8(1), e54429.
3. Volgsten, H., Skoog Svanberg, A., Ekselius, L., Lundkvist, Ö., & Sundström Poromaa, I. (2008). Prevalence of psychiatric disorders in infertile women and men undergoing in vitro fertilization treatment. Human Reproduction, 23(9), 2056-2063.
4. Ombelet, W. (2020). WHO fact sheet on infertility gives hope to millions of infertile couples worldwide. Facts, Views & Vision in ObGyn, 12(4), 249-251.
5. Roupa, Z., Sotiropoulou, P., Koulouri, A., & Wozniak, G. (2009). Causes of infertility in women at reproductive age. Health Science Journal, 3(2), 80-87.
6. Suleiman, M., August, F., Nanyaro, M. W., Wangwe, P., Kikula, A., Balandya, B., ... & Muganyizi, P. (2023). Quality of life and associated factors among infertile women attending infertility clinic at Mnazi Mmoja Hospital, Zanzibar. BMC Women's Health, 23(1), 1-7.
7. Tokbaeva, G. (2021). Career resilience of female professionals in the male-dominated IT industry. Gender, Work & Organization.
8. Gurevich, B. R. (2022). In vitro fertilization (IVF): What to expect where to start with the IVF process.
9. McLaren, J. F., Molinaro, T. A., Croly, S. L., Coutifaris, C., & Dokras, A. (2008). Total failed fertilization in IVF: Current etiologies and predictors. Fertility and Sterility, 90(2), 338-339.
10. Peipert, B. J., Adashi, E. Y., Penzias, A., & Jain, T. (2023). Global in vitro fertilization utilization: How does the United States compare? F&S Reports, 4(3), 326-327.
11. Chiware, T. M., Vermeulen, N., Blondeel, K., Farquharson, R., Kiarie, J., Lundin, K., ... & Toskin, I. (2021). IVF and other ART in low- and middle-income countries: A systematic landscape analysis. Human Reproduction Update, 27(2), 213-228.
12. Ombelet, W., & Onofre, J. (2019). Infertility care in developing countries: The walking egg project. Facts, Views & Vision in ObGyn, 11(1), 65-76.
13. Hossain, S., Nira, J. A., Chowdhury, L., Begum, A. A., Akter, N., & Farzana, S. (2020). Outcome of in-vitro fertilization in the first government setup fertility center of

Bangladesh. Journal of Armed Forces Medical College, Bangladesh, 16(1), 29-34.
14. Winkelman, W. D., Katz, P. P., Smith, J. F., & Rowen, T. S. (2016). The sexual impact of infertility among women seeking fertility care. Sexual Medicine, 4(3), 190-197.
15. Esinler, I., Bozdag, G., Aybar, F., Bayar, U., & Yarali, H. (2006). Outcome of in vitro fertilization/intracytoplasmic sperm injection after laparoscopic cystectomy for endometriomas. Fertility and Sterility, 85(6), 1730-1735.
16. Uddin, S., Wahed, I. I., Sahab Haque, A., & Anwarul, N. R. (2018). Current consequences and research of human infertility in Bangladesh. International Medical Journal, 3(1), 18.
17. Bodri, D., Kawachiya, S., De Brucker, M., Tournaye, H., Kondo, M., Kato, R., & Matsumoto, T. (2014). Cumulative success rates following mild IVF in unselected infertile patients: a 3-year, single-centre cohort study. Reproductive biomedicine online, 28(5), 572–581. https://doi.org/10.1016/j.rbmo.2014.01.002.
18. Baird, D. T., Collins, J., Egozcue, J., Evers, L. H., Gianaroli, L., Leridon, H., Sunde, A., Templeton, A., Van Steirteghem, A., Cohen, J., Crosignani, P. G., Devroey, P., Diedrich, K., Fauser, B. C., Fraser, L., Glasier, A., Liebaers, I., Mautone, G., Penney, G., Tarlatzis, B., … ESHRE Capri Workshop Group (2005). Fertility and ageing. Human reproduction update, 11(3), 261–276. https://doi.org/10.1093/humupd/dmi006.
19. Fauser, B. C. J. M., Adamson, G. D., Boivin, J., Chambers, G. M., de Geyter, C., Dyer, S., Inhorn, M. C., Schmidt, L., Serour, G. I., Tarlatzis, B., Zegers-Hochschild, F., & Contributors and members of the IFFS Demographics and Access to Care Review Board (2024). Declining global fertility rates and the implications for family planning and family building: an IFFS consensus document based on a narrative review of the literature. Human reproduction update, 30(2), 153–173. https://doi.org/10.1093/humupd/dmad028.
20. Frank, O., Bianchi, P. G., & Campana, A. (1994). The end of fertility: Age, fecundity, and fecundability in women. Journal of Biosocial Science, 26(3), 349-368.
21. Liu, D., Li, L., Sun, N., Zhang, X., Yin, P., Zhang, W., ... & Zhang, Q. (2023). Effects of body mass index on IVF outcomes in different age groups. BMC Women's Health, 23(1), 416.
22. Aa, O., Oe, J., Oo, T., Oa, A., & Oa, A. (2017). Hysterosalpingogram findings among women with infertility in Ogun. International Journal of Reproductive Medicine, 3(2), 75-81.
23. Ombelet, W., Cooke, I., Dyer, S., Serour, G., & Devroey, P. (2008). Infertility and the provision of infertility medical services in developing countries. Human Reproduction Update, 14(6), 605-621.
24. Oriji, P. C., Kiridi, E. K., Ubom, A. E., Okoye, C. N., Oriji, V. K., & Awotundun, B. (2022). Pattern of infertility among infertile couples in a tertiary health institution in Bayelsa State, South-South Nigeria. Int J Sci Rep, 8(6), 136-141.
25. Oriji, C. P., Kiridi, K. E., Allagoa, D. O., Omietimi, J. E., Orisabinone, I. B., Makinde, O. I., & Njoku, C. (2020). The use of NAAT-PCR to determine asymptomatic chlamydia and gonorrhoea infections in infertile patients undergoing hysterosalpingogram at the federal medical centre, Yenagoa, South-South Nigeria. Int J Reprod Contracept Obstet Gynecol, 9(4), 1507-1514.
26. Brugh, V. M., & Lipshultz, L. I. (2004). Male factor infertility: Evaluation and management. Medical Clinics of North America, 88(2), 367-385.
27. Eisenberg, M. L., Lathi, R. B., Baker, V. L., Westphal, L. M., Milki, A. A., & Nangia, A. K. (2013). Frequency of the male infertility evaluation: Data from the National Survey of Family Growth. Journal of Urology, 189(3), 1030-1034.
28. Ekwere, P. D., Archibong, E. I., Bassey, E. E., Ekabua, J. E., Ekanem, E. I., & Feyi-Waboso, P. (2007). Infertility among Nigerian couples as seen in Calabar. Port Harcourt Med J, 2(1), 35-40.