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Causes of Infertility of Couples Residing in Libreville

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Abstract

Introduction: According to the World Health Organization, globally one in six people experience infertility in their lifetime. Infertility is considered as a major and global public health issue. In most cases, women bear the burden of infertility to protect the male ego. Although men and women are equally likely to have fertility problems. The aim of this study was to identify the causes of infertility of couples residing in Libreville. **Patients and Methods:** This was a retrospective descriptive study performed over 2 years, from 1st January 2021 to 31st December 2022. Data was obtained from 162 couples attending the assisted reproduction department of the mother and child hospitals in Libreville. Statistical analysis was done using IBM SPSS Statistics version 22.0 software. **Results:** During the study period, 28.5% of couples could afford IVF treatment. The average for woman age was 39.1 ± 4.06 while the average age for male patients was 41.53 ± 7.08 years with minimum and maximum age of 34 et 66 years. More than half (58.6%) of female partners were employed in the public sector. Half of the male partners (50%) were employed in the private sector. The median duration of infertility was 6 years. Approximately 49.4% of couples were diagnosed with primary infertility. The most common causes of infertility in female patients were Fallopian tubes obstruction (53.2%), uterine factors (24.2%) and hormonal problems (19.6%). With regards to male factors infertility, testicular causes were predominant (53.6%). Oligoasthenoteratozoospermia were the major semen abnormalities (55.7%) found after semen evaluation. Both male and female partners were sub-fertile in 47.5% of cases. Unexplained infertility was found in 11% of couples. **Conclusion:** This study showed that the diagnostic of infertility faced by couples residing in Libreville should involve both male and female partner.

Keywords

Epidemiology, Gabon, Infertility

1. Introduction

Around one in six people worldwide are affected by infertility, according to a new report published by the World Health Organization (WHO). Infertility is a major public health problem in most countries. Infertility affects both sexes across the globe [1]. According to the World Health Organization (WHO) demographic studies, in Sub-Saharan Africa, more than 30% of women aged 25 - 49 years suffer from secondary infertility, the inability to achieve a subsequent pregnancy. In several African countries, the success of marriage overlies on the ability of a woman to bear children. Consequently, infertile women are facing serious psychological trauma and social stigma [2] In Africa, many couples who are infertile end up having a divorce [3]. In Gabon, secondary infertility has been predominant, generally due to infections and frequent pelvic surgery [4]. Male reproductive issues account for one-third of infertility cases1. In fact, men are found to be the only cause or a contributing cause of infertility problems in couples in about 40% of cases 2 [5] [6]. Male infertility was associated with many causative factors. Some of them include malformations, environmental factors, hormonal imbalance, genital infections, and immunological as well as genetic causes. Advanced diagnostic tests such as genetic tests are still not performed in Gabon… Semen analysis is consequently the only male infertility diagnostic test in the country. Based on semen analysis, male patients are indicated as sub-fertile if one of the basic semen parameters is below the normal limit [7]. The aim of this study was to identify the causes of infertility of couples residing in Libreville.

2. Patients and Methodology

This was a descriptive retrospective analysis performed over a period of 2 years, from the 1st January 2021 to 31st December 2022. This study included data from 162 couples consulting at the Reproductive Biology Laboratory of the Teaching Hospital Mère Enfant, for IVF treatment.

Data from single female patients was excluded. Demographic data of both female and male partners, type, duration and causes of infertility was recorded in a Microsoft Excel spreadsheet file. Statistical analysis was done using the IBM SPSS Statistics software version 22.0. Results were expressed in percentage, mean standard deviation, minimum and maximum. Authorization to use data was obtained from the ethics committee of the Hospital.

3. Results

Over the study period, IVF treatment was suggested to 569 couples, among them, amongst them 162 (28.5%) could afford the treatment. The average female age was 39.1 ± 4.06 years with minimum and maximum ages 24 and 52 years, respectively. The average male age was 41.53 ± 7.08 with minimum and maximum ages 34 and 66 years. Female patients working at the private sector were predominant (58.6%) **Table 1**.

The average duration of infertility amongst the couples was 6 years. The prevalence of primary infertility was 49.4%, Table 2.

We found abnormalities in 124 of women. Tubal occlusions represented 53.2% of causes, Table 3.

We have found 97 semen parameters abnormalities. oligo astheno teratozoospermia were found in 55.7% of cases, Table 4.

In 53.6% of cases, infertility was caused by testicular origin, Table 5.

In 47.5% of cases, infertility cases were caused by both partners, Table 6.

4. Discussion

Basic access to infertility treatments in resource-poor settings is challenging [8] [9] [10] [11]. In sub-Saharan Africa (SSA) demands for infertility services, in particular assisted reproductive technologies (ART), have increased rapidly in

Table 1. Socio-demographic data from couples undergoing IVF treatment from 1st January 2021 to 31st December 2022.

	Female partner N = 162			Male partner N = 162		
	Year interval	**n**	**%**	**Year interval**	**n**	**%**
Age	[20 - 29]	13	8	[30 - 39]	44	27.2
	[30 - 39]	87	53.7	[40 - 49]	81	50
	[40 - 49]	58	35.8	[50 - 59]	28	17.3
	[≥50 ans]	4	2.5	[≥60 ans]	9	5.5
	Occupation	**n**	**%**	**Occupation**	**n**	**%**
Employment	Public	95	58.6	Public	51	31.5
	Private	45	27.8	Privatte	81	50
	Not emplyed	7	4.3	Not employed	4	2.5

Table 2. Duration of marriage and types of infertility from couples undergoing IVF treatment from 1st January 2021 to 31st December 2022.

Variables	n	%
Duration of infertility (Years)		
≤1	20	12.3
[2 - 5]	61	37.7
[6 - 10]	46	28.4
[>10]	35	21.6
Type of infertility in the couple		
Primary	80	49.4
Secondary	71	43.8
Primary and Secondary	11	6.8

Table 3. Causes of infertility among women undergoing IVF treatment from 1st January 2021 to 31st December 2022.

Causes (n = 124)	Type	n	%
Tubal pathologies 66 (53.2%)	Tubal obstruction	31	47
	Hydrosalpinx	23	34.8
	Salpingitis chronic	12	18.2
Uterine pathologies 30 (24.2%)	Synechia	7	23.3
	Polyp	6	20
	Fibroids	13	43.3
	Endometriosis	3	10
	Uterine septum	1	3.4
Hormonale imbalance 24 (19.6%)	Hyperprolactinemia	9	37.5
	Thyroid dysfunction	5	20.8
	Premature insufficiant ovarian	7	29.2
	SOPK	3	12.5
Other 4 (3.2 %)	Ovarian endometriosis	3	75
	Bilateral Oophorectomy	1	25

Table 4. Semen parameters abnormalities among men undergoing IVF treatment from 1st January 2021 to 31st December 2022.

Abnormalities (N = 97)	n	%
Asthenozoospermia	16	16.5
oligo astheno teratozoospermia	54	55.7
Oligozoospermia	13	13.3
Azoospermia	5	5.2
Necrozoospermia	9	9.3

Table 5. Causes of infertility among men undergoing IVF treatment from 1st January 2021 to 31st December 2022.

Causes (n = 97)	Type	n	%
Central origin 3 (3%)	Micropenis	1	33.3
	Prolactine adenoma	2	66.7
Testicular origin 52 (53.6%)	Congenital AMT	09	17.3
	Herniorrhaphy	23	44.2
	Varicocele	12	23.1
	Orchitis	06	11.6
	Testiculare torsion	02	3.8
Lesion of the upper urinary tract 5 (5.1%)	Vasectomy	05	100
Other 37 (38.1%)	Not determined	37	100

Table 6. Responsibility in couples undergoing IVF at CHUME from January 1st to December 31st, 2022.

Causes	n	%
Female factors	47	29.6
Male factors	20	12.4
Both	77	47.5
Unexplained	18	10.5

recent years [12] [13] This was reflected in the current study where only 28.5% of sub-fertilite patients could afford IVF treatment.

In Gabon, more couples are seeking fertility assisted reproductive technology (ART) treatment, however, the cost of the procedure is still a major issue. To date, in Gabon, there is no medical aid covering infertility procedures. Consequently, patients are obliged to pay for themselves. A delay in advanced paternal age in comparison to maternal age was observed in this study. Indeed, the majority of female partners were aged between 30 and 39 years while the majority of male partners were aged between 40 and 49 years. These results confirm previous findings by Kaltsas *et al.*, 2023 who indicated that the average age of fathers at first pregnancy has risen significantly over the last decade owing to various variables, including a longer life expectancy, more access to contraception, later marriage, and other factors [14]. In Gabon, the private sector seems to provide better financial revenues compared to the public sector. This is reflected in the current study where the majority of patients who could afford IVF treatment are working in the private sector.

It was previously found that African women were more likely than those from elsewhere to have a history of sexually transmitted diseases or pregnancy complications, and infertility diagnoses (such as bilateral tubal occlusion or pelvic adhesions) suggestive of previous genital infections [15]. This was confirmed in the current study where tubal occlusion and uterine fibroids were the most common pathologies in female partners.

Furthermore, hormonal causes were also significantly noted. Hormonal pathologies can have an impact on female infertility. For instance, hyperprolactinemia (37.5%) and dysthyroïdie (20.8%) in our study. Hyperprolactinemia causes alterations of the gonadotropic axis in men and women. Hyperprolactinemia which can lead to hypogonadism is one of the main causes of anovulation and women infertility [16].

The secretion of prolactin can be influenced by the production of thyroid hormones. Thyroid hormones can have an effect on the reproductive system. They can also have a direct effect on the hypothalamic–pituitary–gonadal axis (HPG) by interacting with sex steroids, or an indirect effect by using prolactin as a regulator of the reproductive function in females [17]. However, we observed that practicing gynaecologists in Gabon do not investigate enough hormonal factors as possible causes of female infertility. Knowledge exchanges between

gynecologists and endocrinologists practicing in Gabon need to be established.

This study showed asthenozoospermia as the most common semen parameters abnormalities compared to oligozoospermia, azoospermia and necrospermia. This is similar to a previous study by AL-Najjar (2020), which found asthenozoospermia as the major sperm abnormality (66.70%) of all infertile males [18].

Inguinal hernia is one such common surgical disease that is ignored in most of Africa although hernia surgery is one of the most frequent procedures done by paediatric surgeons and general surgeons in the African continent [19]. Even though previous reports have found little evidences on male infertility following herniorrhaphy [20], the current study find an increasing number of sub-fertile male patients with previous herniorrhaphy.

In this study we still observe a significant number (38.1%) of undetermined causes, causing disturbance of the semen analysis. This can be explained by a limitation of our exploration methods and our insufficient technical platform. Indeed, other causes such as the influence of environmental factors [21]. Several environmental factors could impact men fertility in a negative way. These factors are tobacco, marijuana, weight, body mass index, heat, nutritional state, electromagnetic waves and altitude. Also, genetic causes can justify these figures. We do not yet realize karyotypes. We believe that further studies should be carried out in this direction.

The present study highlighted the necessity to provide full clinical examination to both partners in order to evaluate the possible causes of infertility. This was translated in our results where both male and female factors accounted for 47.5%.

5. Conclusion

Uterine fibroids and tubal occlusion were the most common pathologies associated with female infertility in Gabon, while oligozoospermia was the most common pathology in male partners. We still observe a significant number of undetermined causes. Full clinical examination of both partners should be considered in order to have a good chance to start up the couple fertility treatments.

6. Limitations

This was just a preliminary study, with a limited sample size. Consequently, more studies, with higher sample sizes and more statistical analysis need to be performed in order to validate the results of the current study.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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