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# Profile of the Infertile Man at the University Hospital of Conakry (Guinea)

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## Abstract

**Introduction:** Male infertility is defined as the inability of a man to impregnate a woman after 12 months of regular sexual intercourse without contraception. **Objective:** To improve the state of knowledge on the profile of the infertile man in Guinea. **Methodology:** We conducted a prospective, descriptive study over a period of 6 months from October 1st, 2020 to March 31st, 2021. **Results:** We collected an overall number of 71 patients seen onroutine consultation for infertility. They had a mean age of 36.4 years. More than half of our patients were monogamous (79% of cases). Civil servants were the most affected with 38.02% of cases. Primary infertility was dominant in 65% (n = 46) of cases. On clinical examination, varicocele was the most remarkable abnormality with 88.73% (n = 63) followed by testicular hypotrophy with 59.15% (n = 42). Azoospermia was the most frequent sperm abnormality with 22.54% (n = 16) followed by oligospermia with 15.49% (n = 11). Hormonal assessment based on FSH and LH was performed in 16 patients with azoospermia (22.53%). FSH elevation was associated with azoospermia in 6 patients, *i.e.* 8.45%, azoospermia associated with a normal FSH level accounting for 14.08% in our series. **Conclusion:** In our practice, male infertility is becoming more and more of a concern due to the increasing number of patients seeking treatment. The scarcity of a medical assistance for procreation unit alongside with more efficient diagnostic means constitutes a handicap for its management.

## Keywords

Male Infertility, Varicocele, Azoospermia, Spermogram

## 1. Introduction

Male infertility is defined as the absence of conception in a couple due to a male factor after at least 12 months of regular sexual intercourse without contraception [1]. 12 months is shortened to 6 months in the presence of an advanced age of the partner or a history of cryptorchidism [2] [3]. Infertility affects 80 million people worldwide, with one in ten couples experiencing infertility of either a primary or secondary nature [4]. Male infertility, isolated or not, is present in more than 50% of couple infertilities [5]. For its exploration, the spermogram is the reference exam. Infertility can be attributed to the man when there is an alteration in one or more sperm parameters, *i.e.* sperm concentration and/or motility and/or morphology in at least one of two semen samples taken 4 weeks apart [6].

Several infertility factors may coexist in the same patient. Some of these factors affect fertility through different mechanisms. Mechanisms often incriminated in male infertility include erectile disorders (ejaculatory and sexual), endocrine, testicular, seminal obstructive causes and functional alterations of spermatozoa [7].

In African culture, the value of marriage is the ability of the couple to reproduce, and children are seen as a source of power and pride and a source of support for their elderly parents. The desire of the husband's family to have an heir in the family pushes the man to polygamy because it is the woman who is often blamed for infertility.

Thus, in order to update the data on male infertility, which has become a frequent reason for consultation in our department, we deemed it necessary to carry out this work, which aims to contribute to the study of the profile of the infertile man in the urology department of the Ignace Deen National Hospital.

## 2. Methods

### 2.1. Type and Duration of Study

This was a prospective, descriptive study covering a 6-month period from 1 October 2020 to 31 March 2021.

### 2.2. Study Population

We targeted all patients seen on consultation for paternity at the Urology Andrology Department of the Ignace Deen National Hospital.

### 2.3. Selection Criteria

- Inclusion criteria

In this study we included patients received for male infertility who had a complete medical record with at least two spermograms during follow-up and who agreed to participate in the study.

- Non-inclusion criteria

Patients with infertility who did not perform a spermogram or who did not

give consent were not included.

### 2.4. Sampling

We proceeded to an exhaustive recruitment of patients received at the Andrology Urology Department who met our selection criteria.

### 2.5. Data Collection

The data were collected using a pre-established survey form containing all the parameters to be studied and then transferred to the EPI info 7.2 software for analysis.

### 2.6. The Variables Studied

The variables studied were

- epidemiological
- Patient's age: In our study, this was done in years and the patients were divided into 10-year age groups. The extremes, mean age and standard deviation were determined.
- Profession: this was the patient's main activity, divided into the following groups.
- Origin: In this study, we divided patients into rural and urban areas.
- Marital status: Our patients were divided into two groups Monogamous and polygamous.
- Vices: this refers to the consumption of substances likely to cause a significant change in reasoning and alertness (alcohol, tobacco).
- clinical
- Duration of infertility: we obtained the duration of infertility expressed in years; it was classified in 5-year increments.
- Type of infertility: Our patients were divided into primary infertility (patients who had not had children) and secondary infertility (those who had had children).
- BMI: body mass index was determined as the ratio of weight to height$^2$. Our patients were divided into four groups: normal, undernourished, overweight and obese.

  Lean: for patients with a BMI < 18.5 kg/m.

  Normal: for patients with a BMI between 18.5 - 25 kg/m$^2$.

  Overweight: for patients with a BMI between 25 - 30 kg/m$^2$.

  Obese: for patients with a BMI ≥ 30 kg/m$^2$.
- History: This refers to all pathologies developed by the patient or their ascendants and declared cured (varicocele, cryptorchidism, etc.).
- Physical examination data.
- Paraclinical
- Spermogramdata: Sperm was collected in the majority of cases in the laboratory by masturbation after three days of abstinence. We used the WHO 2010

standards to interpret the results of the spermogram, spermocytogram and sperm culture of our patients.

- Ultrasound of scrotal contents: To check for varicocele and assess testicular volume.
- Infectious work-up.
- Hormonal work-up: FSH and testosterone levels were measured in cases of azoospermia or severe oligozoospermia (sperm concentration < 5 million/ml).

### 2.7. Ethical Considerations

Informed consent was sought out from each man prior to the interview and examination. Ethical approval for the study was obtained from the hospital authorities in agreement with the Chair of Urology and Andrology of the Faculty of Health Sciences and Techniques of the Gamal Abdel Nasser University of Conakry.

## 3. Results

Our series included 71 patients with a mean age of 36.64 years and extremes of 26 and 53 years. The age range of 26 and 35 was the most represented with 45.1% of the cases (Table 1). More than half of our patients were monogamous with 79% (n = 56) of cases. Primary infertility was prevalent in our series. It concerned 65% (n = 46) of our patients. This male infertility concerned several professions and was largely represented by civil servants with 38.02% (n = 27) followed by merchants in 15.50% (n = 11) of cases (Table 1). Most of our patients came from urban areas (76%; n = 54). Among them, 29.58% (n = 21) were smokers, 22.54% (n = 16) drank alcohol against 30.98% who drank alcohol and smoked cigarettes. The remaining patients had no vice 16.90% (n = 12). 22.54% of our patients (n = 16) were overweight, 12.68% (n = 9) were obese against 64.78% (n = 46) who were of normal weight.

The duration of male infertility was 4.43 years on average with extremes of 2 to 11 years (Figure 1). Fifty-five percent of the patients had a history. Urethritis dominated the history in 32.73% of cases (n = 18). Next came orchitis 29.09% (n = 16), varicocelectomy 9.09% (n = 5), testicula trauma 5.45% (n = 3), hydrocelectomy 10.91% (n = 6) and herniorrhaphy 12.73% (n = 7) (Table 2). In addition to the desire for a child, 46.47% (n = 33) had erectile dysfunction and one case of anejaculation.

On physical examination, dilatation of the pampiniform plexus suggestive of a varicocele was the most frequent sign 88.73% (n = 63). Testicular hypotrophy was noted in 59.15% (n = 42), epididymal cyst in 19.71% (n = 14), epididymal nodule in 9.85% (n = 7) and bursal vacuity in 9.85% (n = 1). Seven patients had a normal physical examination (Table 1).

As far as the biological work-up is concerned, the spermogram performed in all patients showed a disturbance. Azoospermia was the most frequent disorder

**Table 1.** Distribution of patients according to socio-demographic and clinicalcharacteristics.

| Variables | Number | Percentage (%) |
|---|---|---|
| **Ages** | | |
| 26 - 35 | 32 | 45.07 |
| 36 - 45 | 30 | 42.25 |
| ≥46 | 9 | 12.68 |
| **Profession** | | |
| Civil servant | 27 | 38.02 |
| Merchant | 11 | 15.50 |
| Farmers | 9 | 12.68 |
| Worker | 10 | 14.08 |
| Military | 6 | 8.45 |
| Other | 8 | 11.27 |
| **Marital status** | | |
| Monogamous | 56 | 79 |
| Polygamous | 15 | 21 |
| **Origin** | | |
| Rural | 17 | 24 |
| urban | 54 | 76 |
| **Physical examination** | | |
| Scrotal vacuity | 1 | 1.40 |
| Varicocele | 63 | 88.73 |
| Testicular hypotrophy | 42 | 59.15 |
| Epididymal cyst | 14 | 19.71 |
| Epididymal nodule | 7 | 9.85 |

and concerned 22.54% (n = 16) of cases (Table 3). Sperm culture was negative in 50% of patients. The most frequent germs found in the other patients were *Escherichia coli* 11.27% (n = 8), *Klebsiella* 9.85% (n = 7) and *Staphylococcus aureus* 8.45% (n = 6).

The first-line hormonal assessment based on FSH and LH was performed in 16 patients (22.53%) with azoospermia. FSH elevation was associated with azoospermia in 6 patients. The remaining ten (10) patients had azoospermia associated with a normal FSH level.

Therapeutically, surgery was performed in 64 patients (90.14%), of whom 63 (88.73%) had undergone varicocelectomy and one patient had undergone testicular lowering with orchidopexy.

The other seven patients (9.87%) received a medical treatment based on a combination of anti-oxidants (vitamin E, folic acid, coenzyme Q10, the trace elements zinc and selenium, the amino acids L-arginine and L-carnitin). Life style modification (weight loss, physical activity, stopping smoking) was the measure associated with the management of patients at risk.

**Table 2.** Distribution of patients by antecent and risk factors.

| History and risk factors | Number | Percentage (%) |
|---|---|---|
| **Congenital factors** | | |
| Cryptorchidism | 1 | 1.56 |
| **Idiopathicriskfactors** | | |
| Smoking | 21 | 29.58 |
| Alcohol | 16 | 22.54 |
| Smoking + Alcohol | 22 | 30.98 |
| Obesity | 9 | 12.68 |
| **Acquiredfactors** | | |
| Varicocele | 63 | 88.73 |
| Testicular trauma | 3 | 5.45 |
| **Urogenital infections** | | |
| Urethritis | 18 | 32.73 |
| Orchitis | 16 | 29.09 |
| **Surgical history** | | |
| Herniorrhaphy | 7 | 12.73 |
| Varicocèlectomie | 5 | 9.09 |
| Hydrocelectomy | 6 | 10.91 |

**Table 3.** Distribution of patients according to spermogram results.

| Spermogram | Number | Percentage (%) |
|---|---|---|
| Azoospermia | 16 | 22.54 |
| Asthenozoospermia | 4 | 5.63 |
| Oligozoospermia | 11 | 15.49 |
| Oligoasthénozoospermia | 6 | 8.45 |
| Oligotératozoospermia | 1 | 1.41 |
| Oligoasthenoteratozoospermia | 4 | 5.63 |
| Teratozoospermia | 1 | 1.41 |
| Necrozoospermia | 10 | 14.08 |
| Oligonecrozoospermia | 5 | 7.04 |
| Oligoasthenonécrozoospermia | 10 | 14.08 |
| Asthenonecrozoospermia | 3 | 4.23 |
| Total | 71 | 100 |

## 4. Discussion

Infertility in couples in our societies remains an entire public health problem. The woman is almost always indexed and yet the male share of responsibility is

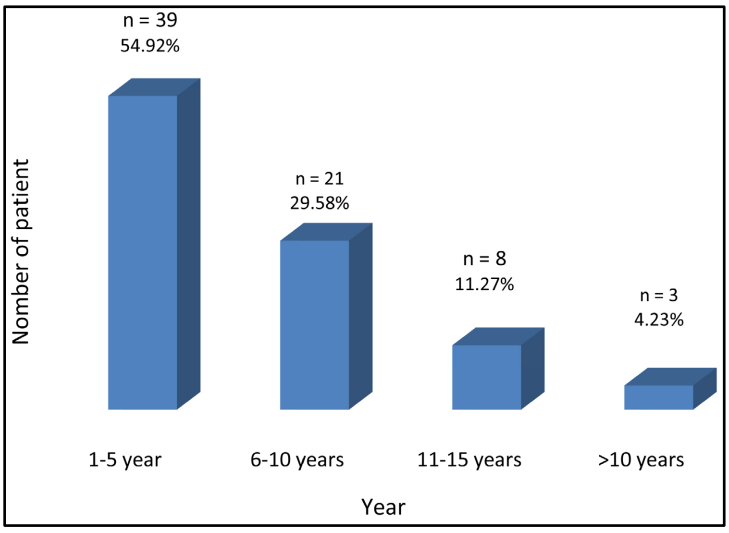


**Figure 1.** Distribution of patients by duration of infertility.

very real as it is incriminated in 40% of cases [8]. Age is known to have an influence on fertility [9]. In our series, the mean age of the patients was 36.64 years with extremes of 26 and 53 years. This average was similar to most African series [10] [11]. Age is a determining factor in the fertility of couples. Thus, the fertility of couples increases from 25% at 20 years of age to almost zero at 45 years of age [12]. In our country, consultations for infertility in couples are usually carried out after marriage. In most cases, women are held responsible for this infertility, as the manly man never questions himself. Investigations always start with the woman before the man is incriminated. Thus, it is after multiple gynaecological consultations with no abnormalities in the woman that the man is led to consult.

The often advanced age of the patients is understandable insofar as the man thinks more about taking a new wife who would be able to give him a child than about starting medical explorations at home [11]. This supposes that infertility of the woman often leads some men to polygamy. In our study we recorded 21% of polygamists. A study carried out in Nigeria, in the west of the country, which included 5874 women with 46% polygamists, did not find any difference in fertility between women whose husbands were polygamists compared to monogamists [13].

Occupational risk factors, notably stress and environmental pollution, would explain the particular representativeness of certain professions [13]. In our series, civil servants were predominant, accounting for 38.10% of our results. This predominance of the educated population in our study can be explained by the fact that it is the most informed segment of the population with regard to infertility. As a result, the illiteracy rate is very high in our countries, and male infertility is misunderstood and wrongly assimilated to a problem of virility. However, more and more of the African population, especially the intellectual population, are aware that the virile man can also be infertile.

People living in urban areas were the most represented in our series,

representing 76% of cases. This observation was also made by Niang *et al*. [11]. In their study they reported a majority of patients from the Dakar region with 79% of cases. This high frequency of patients from urban areas can be explained by the concentration of the populations of the majority of specialist doctors and specialised laboratories in the cities.

With regard to lifestyle habits, smoking was the highest risk factor with 30.98% of cases. These results are consistent with several studies reported in the literature that have shown that active smoking affects both sperm quantity and quality, including count, motility and vitality [14] [15]. Handelsman *et al*. have shown that smoking affects sperm production by reducing it by 13% - 17% in adult male smokers [16]. Paradoxically, other studies have shown no significant effect of smoking on these sperm parameters [17] [18].

In our study, 22.53% of patients were overweight and obesity was 12.67%, lower than the WHO estimate of 27% overweight and 9% obesity [19]. In men, obesity is associated with decreased spermatogenesis. Increased weight leads to a decrease in SHBG and total testosterone, however, overweight is associated with an increase in estradiol production, which decreases the androgen/estradiol ratio and may contribute to the sperm alteration [20].

In terms of duration of infertility, 54.92% of patients had infertility between 1 and 5 years, followed by 29.57% for a period of 5 to 10 years. In line with these results, Diawo Bah [21] found that 42.72% of patients had infertility lasting 5 years. This late discovery of infertility in men can be explained by the delay in consultation due to the myth that the couple's infertility is the sole responsibility of women. In addition, patients resort to traditional healers before consulting a doctor.

Primary infertility was frequently noted in our study with 64.8% of cases. This increase in the frequency of primary infertility compared to secondary infertility is attributed to the fact that couples with no notion of conception start to question themselves early. The man in the second couple is quick to disclaim responsibility because of a first pregnancy already achieved [22].

Complaints associated with infertility in our study were dominated by erectile dysfunction in 46.47% of cases and one case of anejaculation. The prevalence of male sexual dysfunction is higher in infertile men than in fertile men. It is thought to be responsible for infertility in about 5% of cases [23].

Erectile dysfunction and anejaculation may be signs of psychological disorders such as depression or denial of paternity and should be treated in a targeted manner [23].

In the patients' history, urogenital infections were frequently cited: urethritis 32.72%, orchitis 29.09%. This rate is reported in the literature to be between 8 and 35% [24]. In hypofertile patients there is an increased seminal bacterial load [25]. Approximately 10% of men with a history of epididymitis later develop azoospermia and 30% develop oligozoospermia. Similarly, infection can lead to excretory duct obstruction and post-infection spermatogenesis abnormalities

[26].

Clinically, varicocele was the most frequent anomaly in 88.73% (n = 63) of our patients. This frequency is increasing, especially since in 1994, Diallo *et al*. [27] reported a frequency of 2% in the same department and in 2007, Bah *et al*. [28] found that among the etiologies of male infertility, varicocele occupied the first place with 16.24%. Our study confirms that of Bah, thus proving that varicocele is the leading cause of infertility in our country. In Senegal in the study by Niang *et al*. [11], varicocele was the most common clinical anomaly, accounting for two thirds of all their patients. In European countries, the availability of medical assistance for procreation (MAP) means that less and less research is being carried out into curable causes of infertility, particularly varicocele [11].

Male infertility is only confirmed when there is an alteration in two spermograms performed 4 weeks apart, affecting one or more sperm parameters, *i.e*. sperm concentration and/or motility and/or morphology [6]. In our patients, sperm parameters were altered to varying degrees. The most frequent abnormalities were azoospermia in 22.53% of cases followed by oligospermia in 15.49% of cases. In the literature, the prevalence of azoospermia is estimated at 10% - 15% of infertile men [29].

This marked alteration of the spermogram may be related in some cases to an infectious disease. In our series, the sperm culture performed in all patients found germs in only 29.58% of cases. Indeed, the ineffectiveness or lack of treatment of infections of the urogenital sphere allows a slow spread of inflammatory processes to the epididymis and testicles [4]. The main danger of especially chronic urogenital infections is dominated mainly by Chlamydia infection. While the prostate and seminal vesicles are glands capable of regeneration, the epididymis is unable to reconstitute its epithelium, and the non-dividing Sertoli cells are therefore unable to be replaced [4] [7]. Chronic genital infections can lead to sclerosis of the genital tract with stasis and accumulation of toxins which can result in reduced sperm count in the ejaculate and asthenospermia [4].

Sometimes these can be chromosomal causes, as the lower the sperm count, the higher the prevalence of chromosomal abnormalities [30] [31]. The prevalence of chromosomal abnormalities is reported to be in the range of 3% - 7% in oligospermia and 13% in azoospermia [29] [32].

Advanced paternal age is also associated with an increased prevalence of genomic and epi genomic sperm abnormalities [33] which may explain infertility in patients without altered sperm parameters and the failure rate of assisted reproductive measures in patients of advanced age.

Hormone assays are essential in cases of severe azoospermia or oligospermia. Hormone assays help to determine whether the subject has gonadotrophic deficiency, testicular insufficiency or failure of spermatogenesis. In our study 62.5% of the azoospermic patients had a normal hormone balance. Emoakpe *et al*. in Nigeria found a frequency of over 60% of azoospermic patients with a normal hormonal balance [34]. Azoospermia can be of secretory or obstructive origin. The distinction between obstructive and secretoryazoospermia is based on testi-

cular volume, FSH values, seminal markers and sometimes testicular biopsies [35] [36]. In secretoryazoospermia the FSH level is high, above normal. As in the case of 6 of our patients who had azoospermia with an elevated FSH level. In the other patients the azoospermia associated with normal FSH level was probably of excretory origin by infectious obstruction of the sperm excretory tract between the testicles and the urogenital tract.

In our daily practice hormone therapy is the only means we use in the search for the etiology of azoospermia. Deferentography, testicular biopsy and PCR (polymerase chain reaction) for the diagnosis of chlamydia, mycoplasma and ureaplasma are not available in our daily practice.

In patients with severe oligospermia, karyotyping is recommended for sperm concentrations of less than 5 million per millilitre and Y-chromosome microdeletions for men with sperm concentrations of less than 1 million per millilitre [37].

As far as the treatment of male infertility is concerned, two etiologies are currently accessible to surgical treatment: varicocele and excretory azoospermia due to obstruction of the male genital tract [35]. As surgical treatment, 88.73% (n = 63) of varicocele cure and 1.40% (n = 1) of testicular lowering with orchidopexy were performed in our series. There were no cases of TESE (testicular sperm extraction) in azoospermic patients for the purpose of Medically Assisted Human Reproduction (MAHR).

Despite the debate on surgical treatment of varicocele, which remains controversial in the literature, there is evidence that in men with a palpable varicocele and impaired sperm parameters, treatment with embolisation can improve sperm parameters and the chances of pregnancy [37]. In our context, many authors [38] [39] have deduced from their results that surgical cure of varicocele does not affect sperm vitality, sperm survival or the rate of abnormal forms, but it does improve sperm count and motility in oligo and/or asthenozoospermic patients to a statistically significant degree.

Antioxidant-based medical treatment was instituted in 9.87% (n = 7), the aim of which was to combat oxidative stress. Oxidative stress has been implicated in the aetiology of male infertility, particularly of idiopathic origin. Dietary supplements containing antioxidants are often prescribed for this indication [35] [36].

The limitations of our study mainly concern the absence of a karyotype to look for microdeletions of the Y chromosome and deferentography. These examinations would have made it possible to determine certain causes of infertility.

## 5. Conclusion

In our practice, male infertility is becoming an increasing concern due to the growing number of patients seeking treatment. Its etiologies are complex and multifactorial. Varicocele and urogenital infections are the main aetiologies that

we have identified. In addition, more thorough diagnostic methods must be put in place as well as the creation of an MAP unit and oocyte and sperm conservation centres for better management of infertile couples in our country.

## Conflicts of Interest

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

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## Survey Sheet

Card number ……

**1) Socio-demographic variables**

Age:……..

Profession:…….

Provenance: Conakry|__| hors Conakry |__|

Marital status: polygamous |__| monogamous |__|

**2) Risk factors**

Tobacco |__| alcohol |__| heat exposure |__| occupational toxicity |__|

Other……

**3) Field**

HIV |__| hepatitis |__| diabetes |__| HTA |__| Age |__| Other….....

**4) Urological history**

Cryptorchidism |__| orchitis |__| hydrocele cure |__| bursal trauma |__| inguinal herniarepair |__| spermaticcord torsion |__| orchidectomy |__|

**5) Type of infertility**

Primary |__| Secondary |__|

Duration of infertility……

**6) Clinical data**

**Diagnostic circumstance:** Incidental|__| on clinical examination |__| on para-clinical assessment |__|, other.....

**Physical examination:** Varicocele |__| cysticepididymis |__| nodularepididymis |__| diminished testicular volume |__| gynecomastia |__| hypo-pilosity |__| macroskelia |__| micro penis |__|

**7) Spermogram data**

Sperm volume: .....

**Count:**

Less than 5 million sperm |__|

5 - 20 million sperm |__|

Azoospermia |__|

**Vitality:**.....

Necrozoospermia: yes |__| no |__|

**Mobility**:.....

Asthenozoospermia: yes |__| no |__|

**Normal forms:**.....

**8) Hormone balance**

Serumtestosterone: high |__|low |__|normal |__|

FSH: high |__| low |__| normal |__|

**9) Therapeutic data**

- **Infectious work-up**

ECBU: Positive |__| Negative |__| If positive give the germ

Aghbs: Positive |__| Negative |__|

Chlamydia and mycoplasmaserology: Positive |__| Negative |__|

Karyotype: Not done |__| If done |__|

- **Drug treatments:**

Hormonal treatment: GnRH |__|FSH |__| androgen |__| bromocriptine |__|

Non-hormonal treatment: folate |__| zinc |__| selenium |__| glutathionevitamin C |__| vitamin E |__|carnitine |__|

- **Surgical treatment:**

Date of surgery:

Mode of anaesthesia:

Procedures:

Post-operative complication:

Length of stay in hospital: