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Epidemiological Profile of Couple Infertility at the Assisted Reproductive Technology Unit at the Hospital-University Establishment of Oran, Algeria

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Abstract

Infertility in couples has become a public health problem in recent years, with causes that may be female, male, or mixed. We conducted a descriptive epidemiological study with retrospective data collection on the records of 300 couples treated in the Assisted Reproductive Technology (ART) unit, obstetrics and gynecology department at the Oran University Hospital (EHUO), Algeria, over a period of two years from January 2019 to December 2021. The objective was to evaluate the various risk factors affecting couple fertility and to determine the most frequent causes. The results indicate that the average age of women was 34.95 ± 6.34 years, while for men it was 41.08 ± 7.54 years. Infertility was primary in 70% of cases, with the duration of infertility ranging from 2 to 8 years (65.66%). In women, hysterosalpingography examination revealed that 5.59% of cases showed tubal obstruction, with polycystic ovary syndrome (PCOS) (40.8%) being the most dominant anomaly, followed by other gynecological histories such as fibroids, cysts, and uterine polyps (45.6%). In men, 59.30% of cases had a pathological spermogram, with the most frequent abnormality being asthenozoospermia (34.6%). Varicocele was found in 16.30% of cases, and 21% of our patients had medical histories, with diabetes being the most dominant disease (55%).

Keywords: infertility, couple, ART, spermogram, Algeria.

Introduction

The World Health Organization (WHO) defines infertility as the failure to achieve pregnancy after more than 12 months of regular sexual intercourse without contraception. Infertility affects millions of people and impacts their families and communities. It is estimated that approximately one in six people of reproductive age worldwide will experience infertility at some point in their lives. Available data reveal that approximately 48 million couples and 186 million individuals are affected by infertility worldwide. It is a condition of the male or female reproductive system; primary infertility is the inability to conceive, while secondary infertility is the inability to conceive after having conceived at least once. The WHO International Classification of Diseases provides additional information on the various primary and secondary causes of infertility in women and men. Infertility can be attributed to the man when there is an alteration of one or more sperm parameters, namely the concentration and/or motility and/or morphology of spermatozoa in at least one of the two semen samples collected four weeks apart. The risk factors are multiple and vary between anatomical, hormonal, infectious and toxic causes. In Africa, particularly in the sub-Saharan region, studies show that the infertility rate of couples is generally high, with variations from one region to another. In Algeria, the infertility rate is estimated at 15%, with men being involved in 65% of cases. Other factors are now recognized as detrimental to the fertility of couples, such as age, overweight and adverse environmental conditions (heat, pesticides, solvents, radiation, etc.). Therefore, several epidemiological studies have been conducted to estimate the prevalence of this pathology in different societies in order to better understand the etiological factors and those presenting risks, and especially to develop techniques and protocols for the management of infertility. The objective of this study is to evaluate the different risk factors weakening the fertility of couples and to determine the most frequent causes within the Medically Assisted Procreation (MAP) unit, Gynecology-Obstetrics department, at the University Hospital of Oran (EHUO), Algeria (Western Algeria).

Materials and methods

This is a descriptive study with retrospective data collection from the files of 300 couples facing infertility problems, followed in the medically assisted procreation

(MAP) unit of the obstetrics and gynecology department over a period of two years, from January 2019 to December 2021. A data collection form was created for each couple, including demographic data, type and duration of infertility, risk factors and family, surgical and medical history

N° DOSSIER :

FICHE TECHNIQUE (couple)

IDENTIFICATION :

Patiente

Age :IMC :

Conjoint

Age :IMC :Wilaya de résidence :Profession :Date de mariage :

ANTECEDENTS :

Antécédents familiaux :oui non

Si oui :maladies cardiovasculairesdiabèteDysthyroïdie autres

Antécédents chirurgicaux :oui non

Si oui :gynécologiquenon gynécologique

Antécédents gynécologiques :oui non

Si oui :OPKendométriouseaménorrhéemal formation utérineautres

Cycle :régulierirrégulier

Antécédents obstétricaux :oui non

Si oui :césarienneFIVIACG arrêtée

Consanguinité :oui non

Antécédents médicaux :oui non

si oui :Maladies cardiovasculairesDiabèteDysthyroïdieAutre

Antécédents chirurgicaux:oui non

si oui :biopsie testiculairevaricocèlehernie inguinalecryptorchidie

Exposition professionnelle :chaleur position assise prolongéeautres exposition aucune exposition

Mode de vie :

tabac :oui nonalcool :oui non

CLINIQUE :

Dystrophie ovarienneoui non

Polype endométrialoui non

Kyste ovarienoui non

Endométrioseoui non

Cerviciteoui non

Autresoui non

Si oui préciser :

Type d'infertilité :primairesecondaire

Durée d'infertilité :

Varicocèle :oui non

Si oui :grade :

Localisation :

Anomalie des rapports :aucune anomalie

Impuissance troubles d'érectionanomalie d'éjaculation

PARACLINIQUE ET THERAPEUTIQUE

Frottis :oui non

Si oui normal inflammatoire

HSG :sans anomaliehydrosalpinx

Obstruction tubaire utérus antéfléchi

Bilan hormonal :

FSH :normalperturbé

LH :normalperturbé

Prolactine :normalperturbé

Œstradiol :normalperturbé

Progestérone :normalperturbé

Sérologie :positif négatif

Traitement :oui non

Si oui :citrate de clomifene gonal (FSH)

FSH :normalpathologique

Prolactine :normalpathologique

Spermogramme :normapathologique

Si pathologie que préciser :

Sérologie :négatifpositif

Indications thérapeutiques :

FIV

IAC

ICSI

Nombres de tentatives :

For all infertile men, a semen sample was collected at the ART laboratory, with an abstinence period ranging from 3 to 5 days according to the guidelines of the Good Practice for Medical Biology Analysis (GBEA) (1994), and in the absence of any infectious syndrome or febrile episode.

Semen analysis was performed manually in the unit after a liquefaction time of 30 minutes at 37°C. All physicochemical characteristics volume, motility (a+b), vitality and concentration of spermatozoa were analyzed. Morphological abnormalities were studied after staining of smears according to the Schöor technique and interpreted

according to David (1975) and modified by Auger and Eustache (2000). All sperm parameters were studied and interpreted according to WHO standards updated in 2010.

Data analysis was performed using SPSS software (version 2012), with results expressed in graphs, qualitative variables as percentages (%) and quantitative variables as means.

Results:

1-Age Range

Among women, the age group most affected by infertility is that of [28-38[years, with an average age of 34.95 ± 6.34 years.

Among men, the most affected age group is that of [35-45[years, with an average age of 41.08 ± 7.54 years (Figure 01).

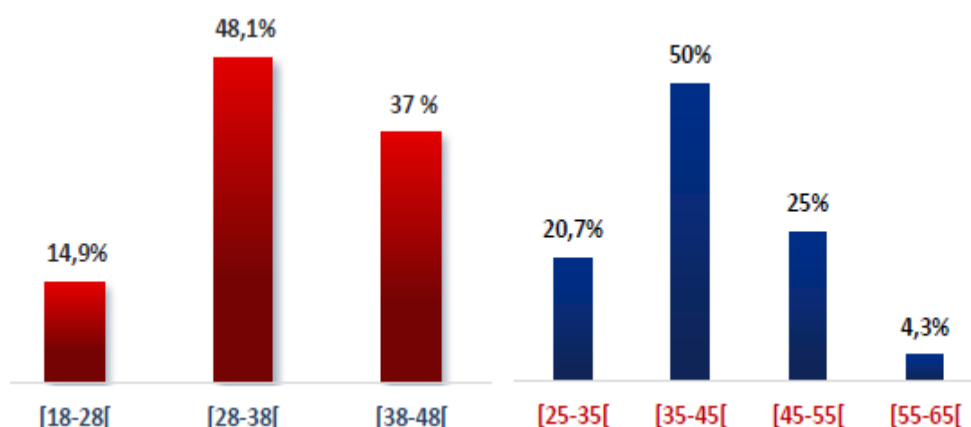


Figure 01: Distribution of couples by age

2. Type of Infertility

In this study, primary infertility was predominant in 70% of cases (Figure 02).

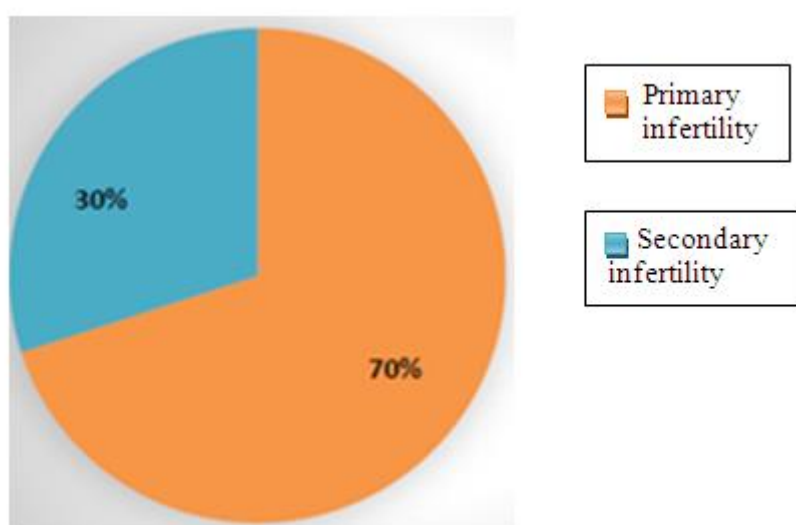
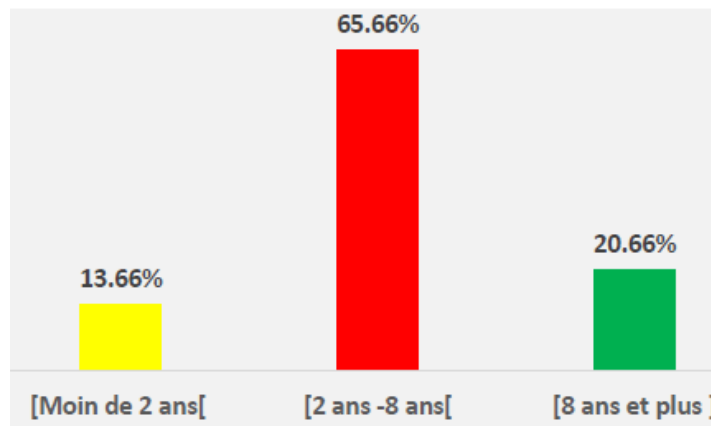


Figure 02: Distribution of couples according to the type of infertility.

3. Duration of Infertility

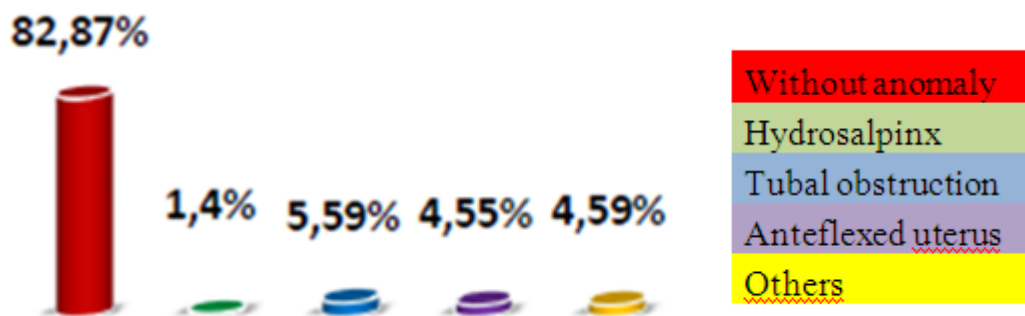
The most common duration of infertility is between 2 to 8 years, representing 65.66% of the infertile population (Figure 03).

**Figure 03:** Distribution of couples according to the duration of infertility.

I. Female Exploration

I.1. Hysterosalpingography

According to the results of the hysterosalpingography, the most recorded anomaly is tubal obstruction in 5.59% of cases (Figure 04).

**Figure 04 :** Distribution of Female Sex According to HSG Examination

I.2. Gynecological History

14.7% of women have gynecological histories, with polycystic ovary syndrome (PCOS) (40.8%) being the most dominant anomaly, followed by other histories such as myomas, cysts, and uterine polyps (45.6%) (Figure 05).

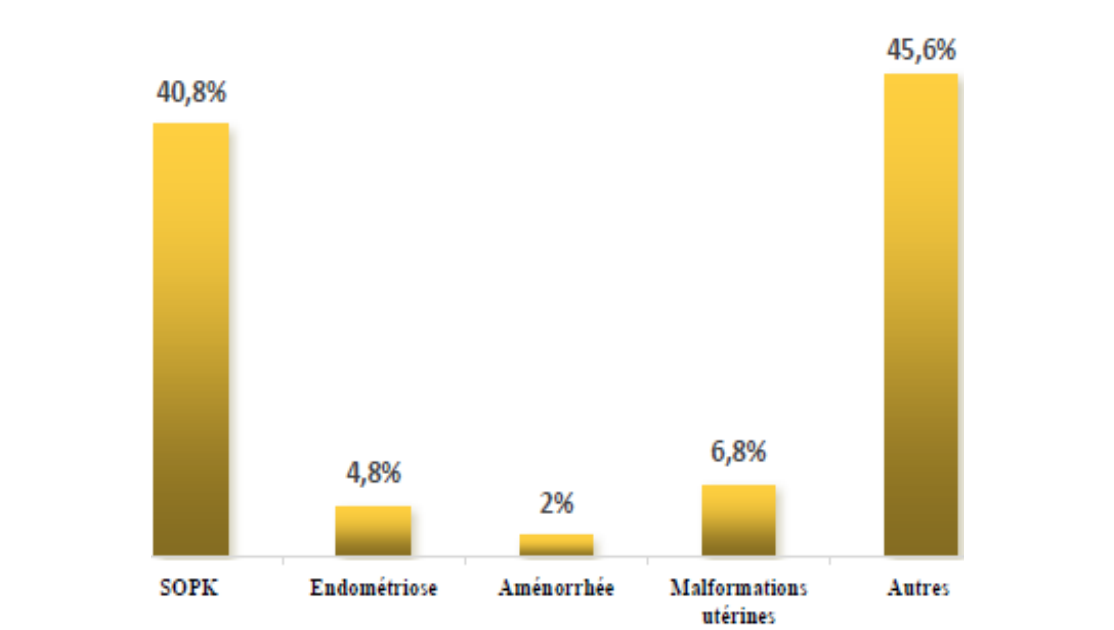


Figure 05: Distribution According to Gynecological History

II. Male Exploration

II.1. Sperm Analysis and Sperm Cytogram

59.30% of our patients have a pathological sperm analysis, with the most frequent anomaly being asthenozoospermia at a percentage of 34.6% (Figure 06).

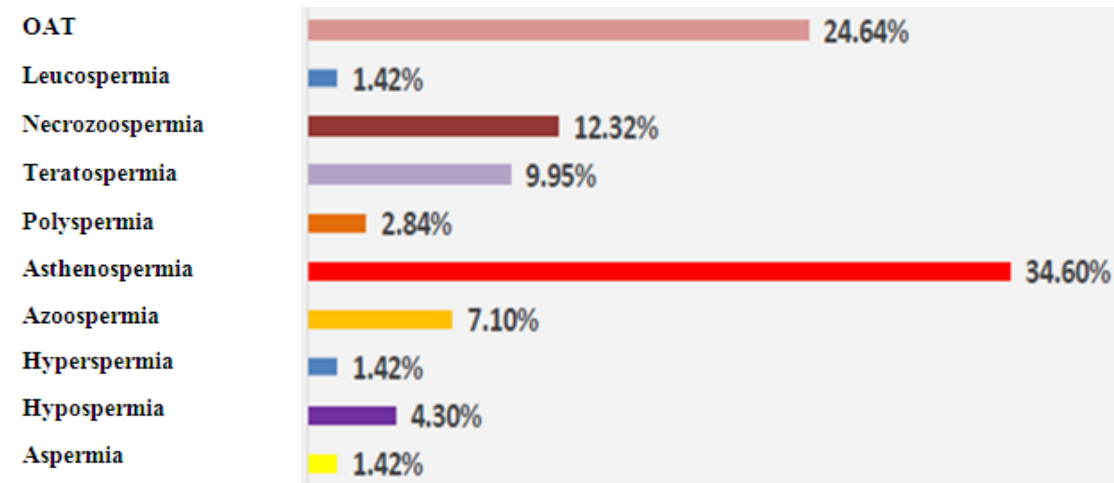


Figure 06. Distribution of Patients According to Pathological Sperm Analysis.

II.2. Varicocele

16.30% of men have a varicocele, predominantly grades 1 or 2 (Figure 07).

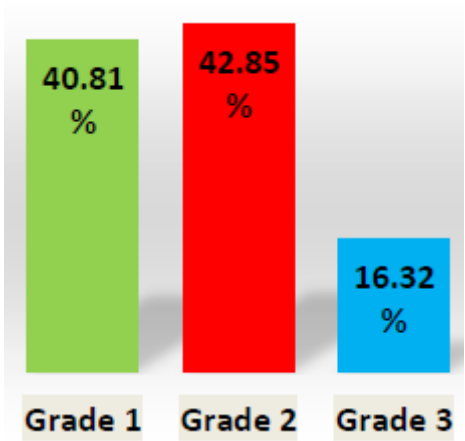


Figure 07. Distribution of Patients According to the Grade of Varicocele.

II.3. Medical History

21% of our patients have medical histories. We recorded a predominance of diabetes (55%), followed by other histories (31.5%) such as dyslipidemia, asthma, and neurological disorders (Figure 08).

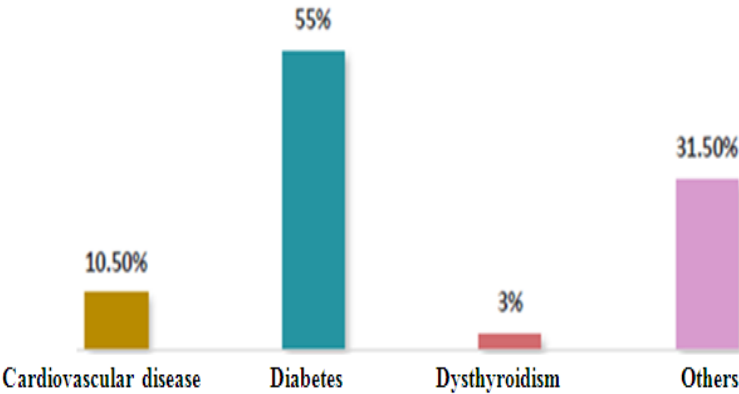


Figure 08. Distribution of Patients According to Medical History

II.4. Surgical History

50% of infertile men had a surgical history of varicocele, while 12.06% had an inguinal hernia (Figure 09).

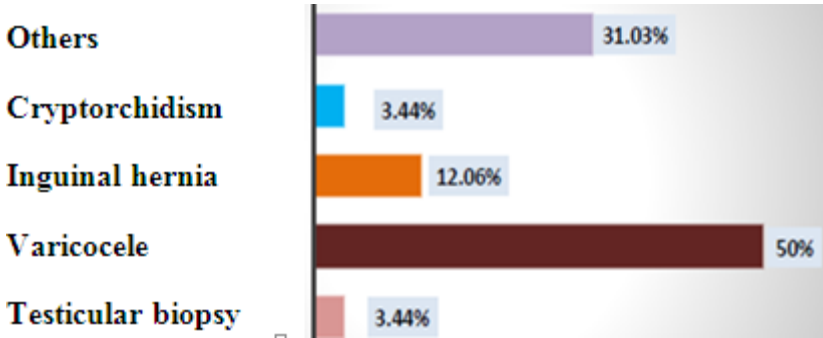


Figure 09 : Distribution of Patients According to Surgical History

Discussion

In our study, the average age of women was 34.95 ± 6.34 years, which is consistent with an African survey in 2022 [9] and another European survey in 2012 [10]. However, this result is higher than that of an African study in 2019 [11]. Age impacts female fertility through multiple pathophysiological mechanisms: quantitative and qualitative decrease in ovarian reserve, decreased fertility rates, reduced pregnancy and live birth rates, and an increase in the number of miscarriages, notably due to the increased frequency of aneuploidies...

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The average age of partners was 41.08 ± 7.54 years, which is consistent with an African study in 2021 [12]. This study highlights abnormal abnormalities in sperm analysis, particularly a decrease in volume and sperm motility with age. These results also correspond with a national survey in France in 2012 [10]. It is also associated with a decrease in spontaneous fertility (due to impaired testicular function with decreasing testosterone levels and altered sperm characteristics). The advanced age of our male population (41.08 ± 7.54 years) maybe due to late marriage in urban settings because of extended education, lack of work, and financial means. In 2002, Algerian men married on average after 30 years, and one in two was still single at ages 30-34. This dramatic rise in singlehood is associated with crisis factors and poverty such as unemployment and housing shortages [13][14].

Regarding the type of infertility, we noted a clear predominance of primary infertility over secondary infertility (70% vs. 30%); these results are consistent with a recent Moroccan study (62%) [15]. This rate varies according to the studies and ranges from 57.4% to 82% [16]. This may be due to the variable prevalence of secondary

infertility factors in different countries, particularly age, which decreases fertility rates in both sexes and alters sperm parameters in men with age [17].

Regarding the duration of infertility, our results are consistent with those found in the literature, which indicated an average duration of 6 years, ranging from 1 to 30 years [18]. The results of this study prove that most patients consult late. Female exploration

Hysterosalpingography is a sensitive examination to detect malformations of the female reproductive system. In our study, the examination showed that only 17.13% of our study population had abnormalities of the uterine cavity and fallopian tubes. Our results do not match those obtained by Onwuchekwa and Oriji (70%) [19] and by Adedigba (56%) [20].

In our series, 14.7% of women had a gynecological history; these results do not agree with those of Jacques Villière, who stated that the frequency of endometriosis is increasing sharply, especially in infertile women, of unknown etiology and poorly understood pathophysiology [21]. Studies indicate that 30 to 50% of women affected by endometriosis face fertility problems. This impact depends largely on the extent of the lesions. However, after treatment, many achieve natural pregnancies, while others must resort to assisted reproductive technologies to have children [22].

Male exploration

Regarding the spermogram results, the sperm parameters in our series were corrected to varying degrees; 59.30% of patients had disturbed values either above or below the standards provided by the WHO. This result is significantly lower than that reported by Shingain in 2016 (91.3%) [23] and higher than that reported by a study conducted in Morocco in 2021 (53.1%) [15].

In our study, varicocele was found in 16.30% of cases. Varicocele is considered the main cause of male infertility, with a prevalence of up to 40% in infertile men. Varicocele can impair spermatogenesis through various mechanisms. Although surgical correction improves sperm count and motility, and therefore natural fertility or assisted reproduction techniques, it does not correct the rate of morphological abnormalities [24].

Diabetes was the most common pathology found in men with a medical history, with a rate of 55%. These results differ from those of Ouattara et al., who found 5% of hypertension and 2% of diabetes [25].

A surgical history is present in 80.7% of cases, with varicocele surgery being the most common (50%). This result is higher compared to Samake [26] and Sissoko [27], who found only 9.3% and 12%, respectively. Ninety percent of patients with untreated bilateral cryptorchidism develop azoospermia. In other cases, such as unilateral, ectopic, inguinal cryptorchidism, treated or untreated, fertility and the possibility of paternity remain unpredictable [28]. Inguinal hernia is implicated in infertility after surgical correction, which can lead to obstructive excretory azoospermia due to iatrogenic obstruction of the vas deferens crossing the inguinal canal [29].

Conclusion

Infertility is a common reason for consultation in Algeria. Its causes are numerous and affect both women and men. They must be sought through a thorough exploration that must be guided during the initial consultation, a fundamental role.

Raising awareness among society and healthcare personnel is essential to achieve the objectives before any medically assisted procreation technique (MAP). Screening and developing a strategy with the couple regarding quality of life and toxic factors are crucial before any infertility treatment to reduce invasive procedures and decrease the number of ovarian stimulations.

Medically assisted procreation techniques represent an important hope for infertile couples. However, in Algeria, as in many other developing countries, these techniques remain inaccessible in all regions and are still not affordable for the general population.

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