

## Research Article

# Description of the characteristics influencing the therapeutic management of infertile couples in western Algeria

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## Summary

**Objective:** The aim of this work is to describe and identify the characteristics that can influence the care of these infertile couples.

**Material and method:** This is a prospective, monocentric study, extending over a period of four years. It is descriptive of a sample of 760 infertile couples treated in the gynaecology and obstetrics department of the Oran hospital and university establishment of 1st November 1954.

**Results:** The study revealed that primary infertility was 74%. The average duration of infertility was  $4.8 \pm 0.2$  years (minimum 6 months, maximum 25 years); the average age of infertile couples was  $33.2 \pm 0.4$  years (minimum 18 years, maximum 45 years) in women and  $39.5 \pm 0.5$  years (minimum 23 years, maximum 71 years) in men. The male origin of infertility was 30.4%, mixed at 29.2%, female at 27% and unexplained at 13.4%. Oligo-astheno-severe teratospermia dominated male infertility at 30.4%. Tubal causes 23.4% and ovulatory causes 22.8% were mainly of female origin of infertility.

**Conclusion:** The study of these characteristics showed a delay in the treatment of infertile couples. The primary type and long duration of infertility and the advanced age of both women and men make the chances of conception minimal. The male origin of infertility is more important than the female origin, suggesting a deterioration in sperm parameters. Tubal causes in the female origin of infertility are important because of the increasing prevalence of sexually transmitted infections.

## Introduction

Infertility is characterised by a couple's inability to conceive a child. It is defined by the World Health Organization (WHO) in 2009 [1] as the failure to achieve a clinical pregnancy after 12 months of unprotected sexual intercourse and after six months [2] if the woman is over 35 years of age. Infertility is said to be "primary" if the couple has never conceived, and it is said to be "secondary" if a pregnancy has occurred [3,4] in the past. According to the WHO, 10 to 15% couples in the world are concerned [5], which corresponds to more than 186 million people worldwide, the majority of whom are from the

developing countries [6]. Africa counts about 20 - 35 million, particularly higher in Sub-Saharan Africa [7]. In Canada, 11-16% of couples are estimated to be affected [8]. In France, one in seven couples are infertile and one in ten are undergoing treatment [9]. In Tunisia, 15% of couples of childbearing age [10]. In Algeria, despite population growth, the Ministry of Health estimates this rate at 10.6% [11].

Faced with a couple who decide to consult for infertility, the gynaecologist has to identify the various social, psychological, medical and sexological elements. He also has the task of investigating the factors that influence infertility, which are represented by: the primary or secondary type of infertility, the

duration of infertility, the age of the woman and the age of the man, and the origin or cause of the infertility.

Some studies [12,13] have shown that primary infertility reduces the chances of pregnancy compared to secondary infertility.

As the duration of infertility increases, the chances of pregnancy decrease. In fact, 80% of pregnancies are obtained in the first six cycles of pregnancy. 55% of those who remain so-called hypofertile will achieve a pregnancy in 36 months and after 2 years, 5% of couples are said to be infertile with an almost zero rate of spontaneous pregnancy [14].

A woman's age is a determining factor in fertility. Fertility in women declines with increasing age, with a sharp increase in fertility decline from the age of 35 onwards [15]. For men, sperm changes are not noticeable until the age of 45 [16]; however, the foetal risk of genetic diseases such as Down's syndrome, when the father's age exceeds 45, is recognised [16].

Infertility is no longer a woman's prerogative, as is the case in our society, where she is considered to be the primary cause of the problem. The epidemiological investigation by Thonneau, et al. in 1991 highlighted the shared responsibility of men and women for the couple's infertility [9]. Infertility in men quickly emerged as an important factor, accounting for 50% of the causes of difficulties in conceiving [17]. The study by Agarwal, et al. showed that male infertility rates were higher in Africa and Central and Eastern Europe, compared to North America and Australia [18]; It has been observed that a high proportion of young men currently have unfavourable sperm characteristics [19], with damaged mucus-sperm histocounts [20].

The identification of these characteristics makes it possible to establish a prognosis and consequently influence therapeutic management.

The aim of this work was to describe and identify the characteristics which influence the management of these infertile couples.

## Material and method

### Type of study

This is a prospective and descriptive study of a sample of infertile couples cared for in the gynaecology and obstetrics department of the Oran hospital and university establishment.

It is a monocentric study over a period of 4 years, from 1 January 2009 to 31 December 2012.

### Study population

This is a population of infertile couples who have consulted for the first time in the fertility unit of the obstetric gynaecology department. The recruitment of couples was done in an exhaustive manner.

## Criteria for inclusion

We included in the study:

- infertile couples residing in western Algeria.
- infertile couples whose man and woman were jointly involved in the care within the unit.
- couples whose wife was 45 years old or less.

## Exclusion criteria

- couples who refused to do their follow-up jointly within the unit

Thus our study sample was reduced to 760 instead of 972 couples.

## Data collection

The survey was carried out by means of a questionnaire which consisted of four parts:

- The first part allows the identification of the infertile couple, age of the woman, man and socio-economic level.
- The second part specifies the history, type and duration of infertility.
- The third section deals with the origin of the infertility (female, male, mixed or unexplained) and allows the identification of the possible cause(s) of basic infertility by means of a check-up.

This assessment includes:

- in men: a spermogram and a spermocytogram,
- in women:
  - a hormone test:
    - Prolactin and TSH us
    - FSH, LH, oestradiol performed on the 2nd-3rd day of the cycle.
    - and progesterone made on the 23rd day of the cycle.
  - Endovaginal ultrasound (at the beginning of the cycle). A follicular monitoring of (j10-j14) and hysterosalpingography.
- in the couple: a post-coital test was carried out despite all the discussions on this subject.

Informed and signed consent was obtained from the couple.

## Factors studied

General factors

- Socio-economic level



We grouped them into three levels: the high level group : couples with a high income and a high intellectual level. The medium level includes a working member of the couple and a medium intellectual level. The low level represents the couple with a low income and no level of education.

- Type of infertility: is classified as primary or secondary.
- Duration of infertility is assessed according to its duration (years): ≤ 2, 3-5, > 5.

After 2 years, the chances of spontaneous conception become nil. Each additional year constitutes a pejorative element.

- The age of the woman is divided into classes: ≤ 30, 30-35, 36-40, 41-45
- The age of the man is also divided into classes: ≤ 30, 30-35, 36-40, 41-45, > 45 years old.

At the age of 35 years for women and 45 years for men are taken as a benchmark for a clear decline in fertility.

The origin of infertility is classified as female, male, mixed or unexplained.

- The female origin of infertility is divided into ovulatory, tubal, endometriosis, uterine and cervical causes.
- The masculine origin is divided according to the anomalies of the spermogram interpreted according to the WHO 2010 standards and for morphology, the classification used was David's classification:
  - The spermogram is considered normal if the count is ≥15 million spermatozoa per ml, motility a+b > 30% and typical shape ≥ 30%.
  - Asthenospermia corresponds to (a+b < 30%),
  - Teratospermia is when the typical form < 15%.
  - Moderate oligo-astheno-teratospermia (OAT): the count is 5 - 15 millions/ ml, mobility 10 < a+b < 30% and the typical form at least 15%.
  - Severe OAT: the count is < 5 million/ml, mobility a+b < 10% and the typical form less than 10%.

**Statistical analysis**

The statistical analysis of the data was carried out using EPI Data 3.1 software.

The estimation was made by frequency for qualitative variables and average for quantitative variables.

**Results**

**Causes of exclusion**

- Of the 972 infertile couples recruited, only 760 (78%) infertile couples constituted the sample to be studied. 22% of the couples were disqualified, the main causes

being: 10.7% of the couples never came back to the unit, 4.8% the woman was over 45 years of age and 6.5% the spouse refused to have a spermogram (Figure 1).

**Study of the characteristics influencing the infertility of couples**

**A. General factors: Table 1**

- 71% of the couples had a medium socio-economic level and 14% a low socio-economic level.

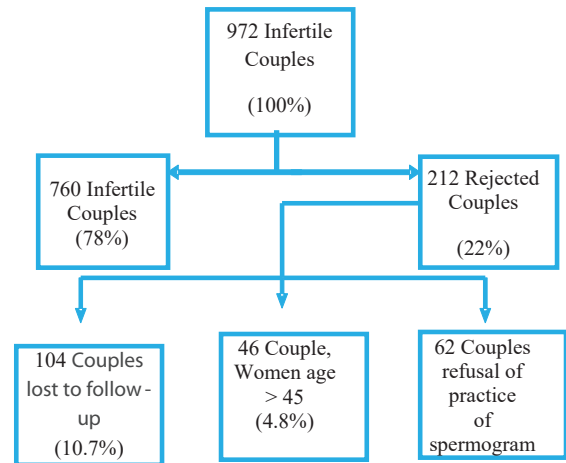


Figure 1: Causes of exclusion of infertile couples.

Table 1: General parameters.

Infertility Factors	Percentage %	Number
Socio- économique level		
High	15	114
Average	71	540
Low	14	106
Type of infertility		
Primary	74	566
Secondary	26	194
Duration of infertility (ans)		
≤ 2	31,2	237
3- 5	37,8	287
≥ 5	31	236
Woman's age		
≤ 30	34.5	262
31-35	32	243
36-40	22.8	173
41-45	10.7	82
Age of man		
≤ 30	8.8	66
31-35	23.3	177
36-40	28.6	217
41-45	18.8	143
> 45	20.5	157
Total	100	760



- 74% of the couples had primary infertility and 26% secondary infertility.
- The average duration of infertility was  $4.8 \pm 0.2$  years (min 6 months, max 25 years) and the median was 4 years. 69% of the infertile couples had infertility for more than 2 years and 31% for more than 5 years.
- The average age of women was  $33.2 \pm 0.4$  years (min 18, max 45), and the median was 33 years. The distribution by age group shows that 33.5% were over 35 years of age, of which 10.7% were over 40 years of age.

The average age of men was  $39.5 \pm 0.5$  years (minimum was 23, maximum 71) and the median was 39 years. 68% of men were over 35 and 20.5% over 45.

### B. Origins of infertility and different male and female causes

The male origin of infertility was the most dominant at 30.4%, mixed at 29.2% and female at 27%. The unexplained origin was 13.4%.

#### 1- Male causes (Figure 2)

The spermogram came back normal in 41.5%. Sperm count anomalies were dominated by severe OAT at 18.8%, asthenospermia at 16% and moderate OAT at 15.7%. Azoospermia was 4.2% and teratospermia 3.8%.

#### 2- Female causes (Table 2)

- The female origin of infertility was dominated by tubal causes at 23.4%, ovulatory causes at 22.8%.
- Of the 22.8% of ovulatory disorders, polycystic ovary syndrome (PCOS) was the leading cause of ovulatory disorders at 9%, followed by early ovarian failure at 6% and luteal insufficiency at 2.5%.

## Discussion

### Causes of exclusion of couples

Caring for infertile couples is difficult and demanding. Many couples who consult for infertility are abandoned for

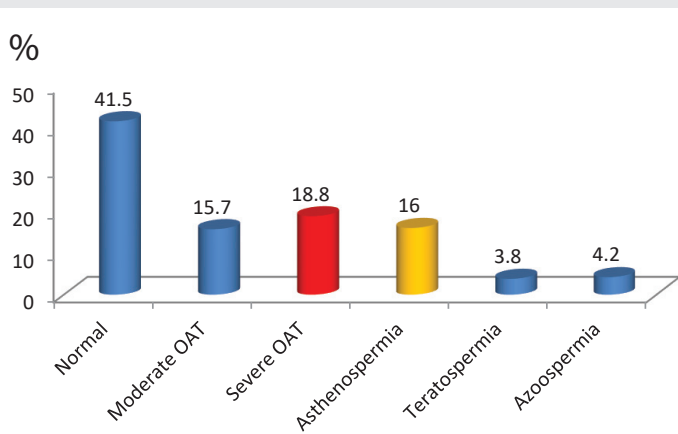


Figure 2: Male causes according to spermogram anomalies.

Table 2: The different female causes of infertility.

Female causes	Percentage (%)
Présence	56.2
- tubal	23.4
- ovulatory	22.8
- utérine	3.9
- endométriosis	3.5
- cervical abnormalities	2.6
Absence	43.8
Total	100

a variety of reasons. In our study, 22% of the couples were not included with 10.7% lost, 4.8% of the women were over 45 years old with a collapsed ovarian reserve and in 6.5% the man refused to have a spermogram and/or to be involved in the follow-up. Ferreira, et al. [21] in their 2007 study, out of 685 infertile couples who consulted the Reproductive Medicine department of Toulouse University Hospital for the first time, found a drop-out rate of 19.6% before treatment and 22.8% during treatment. Brandes, et al. in 2009 [22] showed that half of the couples who dropped out stopped before starting any treatment. Couple drop-out rates differ from one centre to another and the reasons for dropping out are: poor prognosis, spontaneous pregnancy, psychological suffering, adoption or separation of the couple.

### Characteristics influencing couple infertility

#### General factors

- **Type of infertility:** Recent studies show a predominance of primary over secondary infertility: 74% in our study, 68% in the Walschaerts study [23] and for Safarinejad, [24] a significant increase in primary infertility from 2.6 to 5.5% from 1985-2000. While other studies estimate that secondary infertility is the most prevalent form of infertility in the world [25,26]. secondary infertility is mainly related to post-abortion and postpartum infections [6]. These infertilities are described as "preventable" infertilities [27].
- **Duration of infertility:** In our study the average duration of infertility was  $4.8 \text{ years} \pm 0.2$ , 3 years in Stan's study [28] and  $2.8 \pm 2$  years in Walschaerts' study [23]. This seniority of infertility can be explained by taking several factors into account:

**Medical factor:** In the absence of a specialised centre, care for the infertile couple remains poor and the couple remains lost in the face of sometimes multiple and contradictory opinions. Whereas the infertile couple must be cared for in a specialised centre with a multidisciplinary team which makes it possible to establish a prognosis and guide the couple towards a codified course of action.

**Social factor:** The woman is the first person responsible for the infertility in the couple and she is the first to present herself for consultation. We sometimes note a resistance on

the part of men in our society to have a spermogram because of the confusion in terms of virility and fertility. This is why in our study we continued to favour the post-coital test although it was abandoned by most of the authors. However, it remains reliable when it comes back positive.

If the man in the couple presented himself for the first time at an andrology consultation, it is the woman who has to follow up instead of her husband by taking the results of the spermogram or other paraclinical tests back to the andrologist. In fact, it has been found that 60% of andrological consultations are made up of women. They act as an intermediary between the andrologist and their husbands for the most motivated of them.

We have also noted that many men have sometimes repeated failures in sperm collection due to the fact that the conditions for collection are not completely fulfilled. Hence the interest in improving the conditions and creating specialised centres to freeze sperm for use in Medically Assisted Procreation (MAP).

**Economic factor:** It constitutes a prognostic factor in the care of the infertile couple. Several studies show that the cost of treatment is a very important factor in abandonment in some countries [29,30].

Care for infertile couples in Algeria is free of charge in public hospitals. The estimate of the socio-economic level of the population studied found an average level in 71% and a low level in 14%. This population could not afford examinations, hormone therapies that are 80% reimbursable by social security for the contributing population who remain beneficiaries, and LDC techniques, particularly IVF/ICSI, which are excessively expensive. In our study, it was noted that only 5.8% of infertile couples had used LDC techniques in their past, with 1.8% using IVF/ICSI, in private and sometimes foreign centres.

- The woman's age is probably the most important factor in any care for the infertile couple. All the studies show that as the age of women in the care centres is increasing, the results are likely to be poorer due to the decrease in natural fertility in women from the age of 35 onwards [31]. The age assessment of women in our population remains similar to other infertility consultant populations.

In our society and according to the National Multiple Indicator Survey 3 [32], the decrease in the age of marriage and consequently the age of first pregnancy contribute to an increase in the age of patients seeking medically assisted reproduction. The average age of marriage has risen to 29.8 years for women and 33.5 years for men, whereas ten years ago the average age of marriage was 18.3 and 23.8 years for women and men respectively. The age of first pregnancy is currently reported to be 31.02 years for women.

According to the FIVNAT [33] data, the age of patients entering the in vitro fertilisation (IVF) cycle has risen in 20 years from 33.3 years in 1986 to 34.5 years in 2004, and those aged 40 and over from 12% to 17%. A Dutch team from Groningen [34] has shown, in a study of 10,436 women, that parallel to this increase in age at first pregnancy, there is a

decrease in age at the first consultation in their infertility centre. The average age at the first consultation rose from 27.7 years in 1985 to 31.3 years in 2005. Moreover, the percentage of women over 35 years of age was 7.9% in 1985, compared to 29.5% in 2005.

- **Age of the man:** similarly an increase in the age of men who consult for infertility has been noted. In his study Walschaerts. M [20] reports that the average age of infertile men was  $34 \pm 6$  years (62% had  $\leq 35$  years); the average age of men was 34.3 in insemination (2204 IUI) and 34.8 in IVF (1286 IVF) for Bellvers [35]. Our study found a much older male population compared to these two studies (39 versus 34 years) with a percentage in the age distribution which represents the opposite of ours (62% for those 35 years and under versus 68% for those over 35 years).

### Origins and causes of infertility

Our study reveals that male infertility accounts for 30.4%, similar to other studies [20,36]. Other studies show a higher rate: more than 33% in a Dutch study in 2002 and in another study published the same year [37,38], 39% according to FIVNAT data [33]. The Donkers study [39] gives a lower figure of 25%.

For Donckers [39], the etiologies listed are male factors (25%), ovulatory disorders (17%), tubal alterations (7%) and unexplained infertility (10%). Snick, et al. [20] report 30% unexplained infertility, 30% male infertility including 4.5% azoospermia, 26% ovulatory disorders, 13% tubal alterations, 3.2% endometriosis and 28% cervical mucus alterations. A study by Maheshawani [40.] found 20% ovulatory problems, 19% tubal, 34.4% male and 22.4% unexplained. Disaggregating women over and under 35 years of age, he finds a much higher rate of unexplained in those over 35 years of age indicating hidden ovarian failure [40.]. Anovulation, fallopian tube disease, pelvic adhesions, endometriosis and unexplained infertility are the main female causes for Robert, et al. [41].

All these studies demonstrate the predominance of the male origin of infertility in different countries of the world in relation to a decrease in sperm quality and quantity. This deterioration in sperm concentration, which has been observed since the second half of the twentieth century [19] in western countries and probably in our own, is revealed by this percentage which is consistent with these studies. This alteration in sperm concentration is such that it could result in a decrease in the occurrence of pregnancy. In the study by Snick and Maheshawani [20,40], the frequency of the different origins and causes of infertility was found to be more or less the same. Snick's study found an azoospermia rate identical to ours and raised an alteration of the cervical mucus in 28%, which is an avenue of research on mucus-sperm histocompatibility [20].

However, the tubal causes in our population are much more important than the figures reported in these studies, in relation to the increase in salpingitis secondary to sexually transmitted infections.



Given the high prevalence of Chlamydiae trachomatis infection in upper genital infections and the often symptomatic or even asymptomatic pauci character of this pathology linked to this germ, some recommendations have underlined the need for systematic screening for Chlamydiae trachomatis among young populations at risk. Other authors have also suggested that this screening should be extended to couples suffering from infertility [41].

## Conclusion

Infertility is a problem encountered by an increasing number of couples.

Indeed, the analysis of the factors influencing infertility has shown that the primary type and significant duration of infertility, the advanced age of the woman and the man are pejorative elements in the care of couples because they make the chances of conception minimal even when MPA techniques are used the success rate is likely to be low.

The greater male origin of infertility than the female suggests a deterioration in sperm parameters probably related to environmental factors that are toxic to human fertility. The management of tubal infertility remains expensive and is the responsibility of LDC technologies, mainly IVF.

Information for couples on human reproduction is essential. Couples should be encouraged to marry at a younger age and to plan their desire for children as early as possible. In case of difficulty, they should be encouraged to consult earlier in specialised centres as the risk of infertility will be increased.

## Limitations of the study

The search for the causes of infertility was limited to the basic infertility check-up. The therapy received by the couple was limited and depended on their socio-economic level.

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