

Epidemiology of infertility in the Fez -Morocco-(About 258 couples)

Fouad Ech chouyekh *, Sofia Jayi, Yassine belhaj, FZ Fdili Alaoui, Hikmat Chaara and MA Melhouf

Department of Obstetrics Gynecology II, Hassan II university hospital center, Sidi Mohamed Ben Abdellah Faculty, Fes, Morocco.

International Journal of Science and Research Archive, 2024, 13(01), 1972–1978

Publication history: Received on 22 August 2024; revised on 01 October 2024; accepted on 03 October 2024

Article DOI: <https://doi.org/10.30574/ijrsra.2024.13.1.1852>

Abstract

Introduction: This work aimed to illustrate the epidemiology of infertility in the Fes region, taking into account the socio-psychological impact of this entity, which remains very poorly experienced, especially in Moroccan society.

Patients and methods: This is a retrospective, observational and analytical study, involving 258 couples, within the Gyneco-Obstetrics II department of the Hassan II University Hospital in Fes. Data collection was carried out in September 2018. as of March 2021 based on a questionnaire written for this purpose.

Results:

- The average age of women was 32 years with extremes ranging from 22 to 42 years.
- the time taken for consultations for the first time varying between 18 months and 4 years with an average of 02 years and 09 months
- 82% of couples had primary infertility and 7.59% had secondary infertility.
- The duration of infertility varies between 1 year and 17 years with an average of 9 years, of which 26.6% of couples have infertility for more than 10 years.
- Origin of infertility in our study is male in 44%, female in 36.6%, mixed in 6.6% and unexplained in 12.4% of couples.
- The female etiology of infertility is: 25.5% of tubal origin, 31.5% of low ovarian reserve, 1.5% of premature ovarian failure, 29.3% of polycystic ovary syndrome, 4.5% of endometriotic origin and 7.5% of uterine origin.
- In men the most common anomaly is asthenospermia in 36.1% of spouses.
- therapeutic care :20 patients benefited from laparoscopy,either 7.8%, surgical HSC performed in 3.1%(8 patients),7 patients benefited from ovarian stimulation followed or not by intrauterine insemination, 2 of whom had a biochemical pregnancy. .
- in Vitro Fertilization was indicated in 54 couples, or 20%, due to lack of resources, only 3 couples, or 5.6%, benefited from an in Vitro Fertilization attempt, one of which carried a pregnancy to term, giving a living child.

Conclusion: This study showed that infertility is the result of several causes and that a considerable percentage of etiologies require assisted procreation techniques which are very expensive, which blocks the support of couples, 94.4% of whom are still awaiting the creation of a local center and medical coverage allowing patient care

Keywords: Infertility; IVF; Ovarian reserve; Polycystic ovary; Asthenospermia

* Corresponding author: Fouad Ech chouyekh

1. Introduction

The phenomenon of reproduction is complex, is often considered as a stage in the life of a couple, but some couples nevertheless have difficulty procreating for one reason or another. Couples diagnosed as infertile are enormously affected at the psychosocial level.

Millions of people of childbearing age in the world are affected by infertility, it is estimated that approximately 48 million couples in the world and 800,000 Moroccan couples are affected by infertility.

Given the socio-psychological impact, especially in Moroccan society, of infertility which remains very poorly experienced, we carried out this study to illustrate a little the epidemiology of infertility in the Fez region. This study took place in the PMA unit of the Gyneco-Obstetrics Department II of the HASSAN II University Hospital in Fez on 258 couples.

1.1. Definition

Infertility is the non-permanent inability of a couple to achieve pregnancy after almost a year of regular unprotected sexual intercourse. 2 types:

- Primary infertility: absence of pregnancy in a woman who has never had children before.
 - Secondary infertility: the situation of infertility then manifests itself after one or more pregnancies.
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2. Patients and Methods

This is a retrospective, observational and analytical study, about 258 couples, within the Gyneco-obstetrics II department of the Hassan II University Hospital in Fes. The data collection was carried out from September 2018 to March 2021 in based on a questionnaire written for this purpose.

3. Results and Discussion

3.1. description of the population

- The average age of the patients was 32 years with extremes ranging from 22 years to 42 years due to the negative impact of age on the ovarian reserve it is now well known that women with an older age have higher risks of suffering from infertility [1], in our study 15% are aged over 40 years.
- We note that the time for consultations for the first time varies between 18 months and 4 years with an average of 02 years and 09 months, knowing that a consultation for infertility must be considered after 12 months regular reports and perhaps more early after 06 months if the woman is over 35 years old [2], in fact the longer the consultation period, the longer the duration of infertility and can make the treatment situation more complicated. [3]

3.2. Type and duration of infertility

- 82% of couples had primary infertility, which is the absence of pregnancy after one year of unprotected sexual intercourse in a woman who has never had children before, and 7.59% had secondary infertility, which is the absence of pregnancy after one year. or multiple pregnancies. Indeed, primary infertility represents the most predominant type of infertility and its rate varies between 70% and 73% in European women [4], and it is found in Algeria in relatively young women (31.72 +/- 7.10) about 4 out of five couples have primary infertility. [5]
- The duration of infertility varies between 1 year and 17 years with an average of 9 years, these results reflect the difficulty of access to care and support in our Moroccan context since 26.6% of couples present infertility of more than 10 years with all negative impacts.

3.3. Origin of infertility

in our study is male in 44% with different spermogram abnormalities (table 1) and female in 36.6% of cases (table 2), mixed in 6.6% and unexplained in 12.4%.

3.3.1. Male infertility

Table 1 Distribution of causes of male infertility

	Study by E.Noumi et al. Cameroon	Study by CHU de Marrakech	Our study CHU Hassan II Fez
% male infertility	50	43	44
asthenospermia	21.1	35	34.5
oligospermi	-----	17.5	17.64
oligoasthenospermia	-----	17.5	16.8
azoospermia	-----	5	8.4
oligoasthenoteratospermia	-----	25	22.7

- Given the results obtained and compared to other studies, infertility consultation concerns the couple and not just the woman, and the spermogram is the basic examination to be carried out in men in order to analyze the characteristics of sperm.
- And in the event of an abnormality observed, it is necessary to continue with other assessments: hormonal assessment and testicular ultrasound for the causal diagnosis of male infertility: failure primitive testicular or pathologies of the hypothalamic pituitary axis knowing that there is no real consensus on the indications for hormonal assessment in infertile men apart from Azoospermia, American Societies of Urology and Reproductive Medicine recommend carrying out a hormonal assessment in the event of particularly abnormal severe oligozoospermia, decreased sexual function, suggestive clinical signs of an endocrinopathy especially hypogonadism or hyperthyroidism [6], whereas ultrasound must be systematic in infertile men. In our study the assessment hormonal is requested in 06 patients and scrotal ultrasound was requested in all spouses who have an altered spermogram but could only be carried out in 7 cases per lack of resources resulting in 4 patients with varicocele and 1 patient with testicular hypotrophy.

3.3.2. Female infertility

Table 2 Distribution of causes of female infertility

Female etiology of infertility	Percentage found CHU FES	Percentage found CHU MARAKECH
Tubal origin	25.5	60.6
Low ovarian reserve	31.5	15.2
Premature ovarian failure	1.5	
Polycystic ovary syndrome	29.3	9.1
Endometriotic origin	4.5	12.1
Uterine origin	7.5	3

- In our study, low ovarian reserve is the predominant cause, which explains the delay in consultation in the majority of patients, it is a reduction in the quality or quantity of oocytes leading to a reduction fertility, age is the risk factor for a reduction in ovarian reserve, it is from the age of 30 this reserve begins to decrease and at 40 the decrease is fast. It is diagnosed by the dosage of FSH and estradiol, the AMH level and counting antral follicles however these last 2 tests are currently the best tests. [7]
- Polycystic ovary syndrome is the second abnormality of female infertility in our series, according to the literature this pathology is the most common hormonal disease it is a
- endocrine disorder and a most common heterogeneous condition affecting 5 to 10% of the
- female population [8] with symptoms: dysovulation or anovulation, hyperandrogenism, insulin resistance and risk of hypertension and cardiovascular disease.
- Tubal origin of infertility presents a rate of 25.5% which remains lower than rates found in other national studies: it is said that the movement of zygotes requires normal tubal motility, tubal permeability and integrity

of the ciliated mucosa [9], but in certain cases the tubes can be altered or blocked and the meeting of the zygotes is compromised. tuboperitoneal infertility represents 50 to 60% of cases of female infertility and 30 to 40% of infertility, approximately 80% of infectious origin is secondary to an upper genital infection caused by salpingitis [10] especially for chlamydia and gonococci.

- Concerning the uterine cause, 2 to 3% of infertilities are of exclusively However, in infertile women, intrauterine lesions are much more frequent approximately 40 to 50% of which diagnosis and treatment are the main objectives of the infertility assessment and hysteroscopy remains the reference examination [11]
- The endometriosis cause which presents 4.5% of cases versus 12.1% in Marrakech, characterized by the development of the endometrium outside the uterus colonizing the surrounding organs manifested by several signs in addition to pelvic pain and dyspareunia endometriosis is also a source of infertility [12]

3.4. Paraclinical exploration carried out

The results of our study are obtained after carrying out the various examinations paraclinics for infertility, requested after a questioning and a clinical examination well coded:

3.4.1. Pelvic ultrasound

- At the top we find the ultrasound which remains one of the basic examinations of the assessment of infertility which helps guide the diagnosis and direct other examinations
- complementary, in our study was carried out in all patients returning without anomalies in 52.7% and had observed at least one anomaly in 47.3% of the women (table 3)

Table 3 Abnormalities found on ultrasound

Anomaly	Number
Myoma	02
Synéchia	02
Polyp	02
Partition	03
Ovarian cyst	51
Appearance of Polycystic ovary syndrome	39
Endometriosis	06
Adenomyosis	17

3.4.2. Hysterosalpingography

- Hysterosalpingography is an essential examination to assess patency and tubal pathology, currently it is the only examination that can diagnose the level of tubal obstruction in case of impermeability. Today its indication no longer exists in the evaluation of endocavitary pathology. [13]

The results obtained after its completion in 164 patients, the others had either an immediate indication for IVF, i.e. hydrosalpinx on ultrasound, were pathological in 15.7% and the main anomalies are of tubal origin in 87.2%, synechia in 5.1% and septum in 7.7%.

3.4.3. Hysteroscopy

- Hysteroscopy is an excellent tool and currently the gold standard for evaluation of the uterine cavity, it is more accessible to gynecological surgeons thanks to the innovations in endoscopic procedures [14]. In our series, 32 patients were 14.3% of patients benefited from hysteroscopy either after a call sign ultrasound in 25 cases or before IVF in 4 patients, and in 3 patients concomitant with laparoscopy for tuboperitoneal pathology.
- Table 4 presents the abnormalities found in 10 patients.

Table 4 Anomalies found at hysteroscopy

Anomaly	Number
Synéchia	02
Polyp	02
Endometritis	01
Homogeneous hypertrophy without atypia	01
Trophoblast retention	01
Partition	03

3.4.4. Hormonal assessment

- The hormonal assessment is part of the infertility examinations which aims to explore the female endocrine system, of which interest [15] remains in exploring ovulation and follicular ovarian reserve, and also hormonal evaluation in men in cases of male infertility to demonstrate primary testicular failure or pathologies of the hypothalamic pituitary axis.
- Given the lack of resources among our patients, the hormonal assessment was requested in cases per case depending on the context, if there are signs suggestive of dysovulation or anovulation or age over 35 years AMH is systematically requested, if suspected of Polycystic ovary syndrome the assessment of hyperandrogenism with metabolic assessment if associated obesity. TSHus is systematically requested, FSH LH and E2 if suspected dysovulation or anovulation of central origin, finally prolactin if amenorrhea or cycle disorder.
- 116 women or 44.9% had an abnormal hormonal assessment which was completed by other explorations: low ovarian reserve in 45% of patients, 31% having abnormal FSH LH and E2, 19% elevated or decreased TSH and 5% had hyperprolactinemia.
- In men, hormonal assessment based on FSH and LH was only carried out in 6 patients.

3.4.5. Spermogram

- The spermogram: during a couple infertility assessment, the sperm analysis is prescribed as first intention to assess the characteristics macroscopic and microscopic sperm, in our case the alteration of the spermatogenesis was found in 46% of spouses whose asthenospermia is found in 34.5% followed by oligoasthenoteratospermia in 22.7% then oligospermia in 17.64% then oligoasthenospermia in 16.8% and finally azoospermia found in 8.4%.

3.4.6. Testicular ultrasound

- Testicular ultrasound must be systematic in all infertile men, in our country ultrasound is requested for all spouses who have an altered spermogram, but could only be carried out in 7 men due to lack of means, the results of which found 4 patients with varicocele and 1 patient with testicular hypotrophy.

3.4.7. Genetic assessment

- Without forgetting genetic anomalies which present 6-7% of male infertility and among infertile patients the most common cause of hypogonadism and of infertility in men is Klinefelter syndrome with a percentage of 0.2% in the general population and 14% in azoospermia [16], in we 5 cases or 1.98% of patients had the indications for genetic assessment for severe oligospermia or azoospermia, only 2 of which experienced it, objectifying a Klinefelter syndrome in a patient.

3.5. Support decision

- The decision for a PEC is made on a case-by-case basis according to the final diagnosis after the assessment etiological of infertility; this decision can be based on a surgical procedure by laparoscopy or hysteroscopy to resolve an ovarian, tubal or uterine problem, or PMA with different methods: ovarian stimulation, insemination, injection intracytoplasmic spermatozoa or in vitro fertilization.

3.5.1. Laparoscopy

- Laparoscopy makes it possible to diagnose and even treat original infertility tubo-ovariani namely tubal permeability, distal salpingopathies type hydrosalpinx or fimbrial occlusion, proximal salpingopathies secondary to infections or adenomyosis.[17], it allows drilling to be performed in the event of Polycystic ovary syndrome, fimbrioplasty or neosalpingostomy see a salpingectomy to optimize in vitro fertilization in cases of tubal malformation hydrosalpinx or tubal endometriosis [18].
- In our series, 20 patients underwent laparoscopy, in 13 patients it was indicated for tubal obstruction +/- suspicion of adhesion showing an endometriosis in 7 patients, pelvic adhesion + tubal obstruction in 6 patients with adhesiolysis as a procedure in 3 patients, salpingectomy for hydrosalpinx in 2 patients, fimbrioplasty for phimosis in 1 patient, drilling ovarian for Polycystic ovary syndrome in 4 patients and cystectomy for 3 patients.
- Note that a patient had benefited from ovarian drilling following the failure of a trial of stimulation with Clomide subsequently had a pregnancy.

3.5.2. Hysteroscopy

- HSC can be for diagnostic or therapeutic purposes of an intrauterine anomaly in order to restore the integrity of the uterine cavity [19-18], it was carried out in 8 patients with a cure of synechiae in 2 patients, polyp resection in 2 patients, section of a uterine septum in 3 patients and one retention resection trophoblast cells in a patient.

3.5.3. The medically assisted procreation

Ovarian stimulation excluding in vitro fertilization + insemination

- Is a hormonal treatment aimed at stimulating the ovaries to achieve ovulation of quality in the event of ovulation disorders or hormonal dysfunction [20] if the spermogram and tubal status allows it with the obligatory assessment of the follicular response thanks to both ultrasound and biological monitoring [21]
- Ovarian stimulation can be followed by insemination which aims to introduce the spermatozoa in the female genital tract to promote the meeting of gametes.
- in our series 93 women had the indication for stimulation + insemination artificial, either
- 36.04%, including only 7 patients who benefited from it, including 2 patients had a biochemical pregnancy.

In Vitro Fertilization

- It has developed a lot in recent years, it is at the origin of a birth out of thirty in France [22], in our study IVF was indicated in 54 couples, either 20% , only 3 couples or 5.6% benefited from IVF, one of whom was currently pregnant at 32 weeks with a normal pregnancy and the other couples do not have the means.
- Note that the majority of patients stop monitoring the means by default

4. Conclusion

Our study is a clear observation which shed light on a very dark, which is a lack of support in our region for a slice of the large population suffering from infertility with all the consequences that arise, both on an individual (psychic), social (divorce), and professional (profitability). This lack of support is due to the absence of a medically assisted procreation center within the Fez University Hospital and the absence of support by the system of fees for first steps of medically assisted procreation (stimulation of ovulation and intrauterine insemination) which are feasible technically within our university hospital.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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