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Original article

Clinical-epidemiological characterization of infertile couples

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Clinical-epidemiological characterization of infertile homes

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SUMMARY

Infertility is a health problem that affects approximately 10% of couples of reproductive age worldwide. To determine the epidemiological and clinical characteristics of infertile couples treated at the Jimmy Hirzel Polyclinic in Bayamo, Granma province, from January 2021 to December 2022, an observational, descriptive, longitudinal, and retrospective study was conducted, including 76 infertile couples. The variables studied were age, education, occupation, and female and male infertility risk factors. Data were obtained

from medical records and analyzed. Descriptive statistics, absolute and relative frequencies were used. The study found that the largest number of women and men were in the 25- to 34-year-old age group (52.6% and 47.4%, respectively); the highest level of education was 12th grade (43.4% women and 31.6% men); and the majority were employed (92.1% men and 68.4% women). Pelvic inflammatory disease was the most significant clinical risk factor in women (21.1%), and seminal infection was the predominant clinical risk factor in men (32.9%). It was concluded that pelvic inflammatory disease in women and seminal infections in men were the clinical risk factors most frequently detected in the infertile couples studied, this being the main result of the research.

Keywords: Infertility; Risk factors.

SUMMARY

Infertility is a health problem that affects about 10% of couples of reproductive age worldwide. In order to determine the epidemiological and clinical characteristics of infertile couples treated at the Jimmy Hirzel polyclinic in the municipality of Bayamo, Granma province, during January 2021 - December 2022, an observational, descriptive, longitudinal and retrospective study was carried out, which included 76 infertile couples. The following variables were studied: age, education, occupation, female and male risk factors for infertility. Data were obtained from medical records and descriptive statistics, absolute and relative frequencies were used for analysis. The research showed that the largest number of women and men were in the 25 to 34 age group (52.6% and 47.4% respectively); the 12th grade level of schooling predominated (43.4% women and 31.6% men); as well as patients who had an employment relationship (92.1% men and 68.4% women). Pelvic inflammatory disease was the most relevant clinical risk factor in women (21.1%), and seminal infection was the predominant clinical risk factor in men (32.9%). It was concluded that pelvic inflammatory disease in females and seminal infections in males were the clinical risk factors most commonly detected in the infertile couples studied, this

being the main result of the research.

Keywords: Infertility; Risk factors.

SUMMARY

Infertility is a health problem that affects about 10% of reproductive health households worldwide. With the objective of determining the epidemiological and clinical characteristics of two infertile homes treated at the Jimmy Hirzel Polyclinic, in the municipality of Bayamo, province of Granma, during January 2021 to December 2022, an observational, descriptive, longitudinal and retrospective study was carried out, which included 76 infertile homes. They are studied as follows: age, education, occupation, female and male risk factors for infertility. The data obtained are two records and descriptive statistics, absolute and relative frequencies used for analysis. The pelvic inflammatory disease was the most relevant clinical risk factor in women (21.1%), and the seminal infection was the predominant clinical risk factor in men (32.9%). It is concluded that the pelvic inflammatory disease in the female sex and the seminal infections in the male sex are the most commonly detected clinical risk factors in our case studies, this being the main result of the research.

Keywords: Infertility; Cliff factors.

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Introduction

The World Health Organization (WHO) defines infertility as the inability to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse. The American Society for Reproductive Medicine (ASRM) adds to this concept, which can also

be considered when the same situation occurs during therapeutic donor insemination. The term infertility presupposes the existence of an inadequate anatomy and altered physiology that negatively impacts the possibility of pregnancy or its successful completion, establishing an inability to reproduce that can only be resolved through medical treatment. Infertility is classified as primary, when there is no history of previous pregnancies, and secondary, when the couple has successfully or unsuccessfully achieved pregnancy previously, but has difficulty conceiving again. It may also appear as a sequelae of poorly treated sexually transmitted diseases, infections, or injuries from unsafe abortions. This pathology can manifest due to: female, male, or couple causes if both suffer from it (combined or mixed). (1)

The approach to infertility has changed due to the various social changes and scientific advances that have occurred in recent decades. In many countries, reproductive patterns tend to postpone having children. The introduction of assisted reproductive technologies offers a new opportunity to study basic reproductive processes, and the development of molecular biology and genetics has opened up new possibilities for the study and diagnosis of many couples who until now were considered infertile for no apparent reason. (2)

Currently, infertility is a health problem that affects approximately 10% of couples of reproductive age worldwide. In Latin America, approximately 80 million women are registered for consultations for this condition. The term infertility presupposes the existence of an adequate anatomy and an altered physiology that negatively affects the possibility of pregnancy or its successful completion, establishing an inability to reproduce that can only be resolved through medical treatment (1)

The American Society for Reproductive Medicine estimates that infertility affects approximately 6.1 million people in the United States, representing 10% of the reproductive-age population. Three cases are diagnosed per minute, 228 per hour, 5,479 per day, 38,461 per week, 166,666 per month, and 2 million per year. \$18 billion is spent annually on treatment. In France, the infertility prevalence rate is 14.1%. In Belgium, the

overall prevalence ranges between 10% and 15% and appears to have remained stable in recent decades. Infertility is increasingly prevalent in developed societies. (3)

In the Americas, the situation is no different. In the United States, 12% of women of reproductive age are classified as infertile, and 7.3 million couples use infertility services. In Mexico, 2.6 million couples suffer from infertility, and the number of people receiving assisted reproduction treatments increases each year. In Chile, it affects 10.4% of women of reproductive age each year, and 4% of couples remain infertile eight years into their marriage. Between 2018 and 2019, through an active community search process carried out by basic health teams, 141,000 couples considered infertile were identified in Cuba. This prompted the 2018 National Survey of Women of Reproductive Age, with the aim of estimating the current prevalence of infertility in women of reproductive age. (4)

Cuba has a high rate of population aging, and many factors influence this. Despite encouraging women to conceive multiple pregnancies, most couples have one or two children, and another large percentage never achieve a pregnancy due to infertility, leading to a notable daily increase in the number of infertile couples. Studies conducted in the Bayamo municipality report that insufficient scientific information regarding suspected diagnoses and a low risk perception regarding the situations and conditions that increase infertility are factors that contribute to the lack of knowledge among infertile couples. At the Jimmy Hirzel Polyclinic, a total of 1,014 couples have been treated since 2017, as of December 2022. Hence, the reason for conducting this study, which aims to determine the epidemiological and clinical characteristics of infertile couples treated at the Jimmy Hirzel Polyclinic.

Methods

An observational, descriptive, longitudinal and retrospective study was carried out to clinically and epidemiologically characterize infertile couples belonging to the Jimmy Hirzel Polyclinic, from January 2021 to December 2022. The variables studied were: age,

education, occupation, and clinical risk factors in women and men. The universe grouped 102 infertile couples, and 76 of them constituted the sample, according to the selection criteria.

Inclusion and exclusion criteria for the infertility program

Included were:

- Tied women: those who have had a cesarean section and have suffered the loss of one or more children. Tied women over 38 years of age must have their pregnancy transplanted through egg donation, preferably from a family member.
- The habitual abortionists.
- Those who for some reason do not have tubes (ectopic salpingectomy, ligation and other causes).
- Hypertensive patients, but without endothelial damage.
- Same-sex couples: The new Family Code is being implemented for infertility consultations through surrogate motherhood. Same-sex couples must seek a donor. For example, a man-man couple must bring the woman who will provide the surrogate mother. This woman must be apparently healthy and over 25 years old. She is NOT the egg donor; the egg donor must be another woman. Female-female couples must also bring a sperm donor, who is apparently healthy. (This is still under study and may be subject to change.)

Excluded:

- Addictions: alcohol, drugs, others
- Psychiatric conditions: anxiety-depressive syndrome, bipolar disorders, schizophrenia, and others diagnosed by a specialized psychologist
- Mental disability: determined by forensic medicine
- Severe physical disability: pelvic deformities that pose risks to childbirth.
- Advanced autoimmune or rheumatic diseases: example systemic lupus erythematosus, polyarthritis nodosa, scleroderma, others.

- Other chronic degenerative diseases.
- Arterial hypertension with endothelial damage in multiple organ systems at any age.
- Severe high blood pressure in people over 40 years of age.
- Diabetes mellitus with multisystem damage at any age.
- Chronic kidney disease with functional failure.
- Severe heart disease with hemodynamic repercussions.
- Cystic fibrosis and other lung diseases associated with respiratory failure.
- Neuromuscular diseases.
- Difficult-to-control epileptic syndromes.
- Malignant tumors except those with clinical and imaging resolution for more than 5 years.
- Leukemias.
- Chronic liver diseases.
- Inborn errors of metabolism.
- Active sexually transmitted infections.
- Active HIV-AIDS: except undetectable viral load.
- Genetic diseases with autosomal dominant transmission, determined by specialists in clinical genetics.
- Severe malnutrition.
- Morbid obesity.

For the statistical analysis of the data obtained, descriptive statistics, absolute and relative frequencies were used, with the aid of the professional statistical program SPSS 22.0 for Windows.

Results

Table 1 shows the distribution of couples by age, education, occupation, and sex. By age group, the majority were in the 25-34 age group (40 women and 36 men), representing 52.6% and 47.4%, respectively. By education level, both sexes had the highest number of patients in 12th grade: 33 were female (43.4%) and 24 were male (31.6%). By occupation, workers predominated in both sexes: 52 were female (68.4%) and 70 were male (92.1%).

Table 1. Distribution of infertile couples by age, education, occupation, and sex.

Variable	Sex			
	Female		Male	
	Number	Percentage	Number	Percentage
Age				
15-24	17	22.4	5	6.6
25-34	40	52.6	36	47.4
35-44	19	25.5	26	34.2
45-54	0	0	9	11.8
Schooling				
9th grade	5	6.6	8	10.5
12th grade	33	43.4	24	31.6
Medium Technician	12	15.8	16	21.1
Skilled worker	6	7.9	6	7.9
University	20	26.3	22	28.9
Occupation				
Student	5	6.6	2	2.6
Worker	52	68.4	70	92.1
Housewife	19	25.0	4	5.3
Total	76	100.0	76	100.0

Source: medical records

Table 2 shows the incidence of smoking, obesity and malnutrition in couples, by sex.

The research showed that 29 couples did not smoke (38.2%), in 24 couples the woman did not smoke and the man did (31.6%), in 9 couples the woman smoked and the man did not (11.8%), and in 14 couples both had the habit of smoking (18.4%).

Obesity was not present in most couples (75%). In 8 couples, the male sex was obese (10.5%), and in 4 couples, the female sex was obese (5.3%). In 7 couples, obesity was observed in both sexes (9.2%).

Malnutrition was observed in women in 13 couples, in men in 4 couples (17.1 and 5.3% respectively), and in both sexes in 11 couples (14.4%).

Table 2:Incidence of smoking, obesity and malnutrition in couples, by sex.

Variable	Categories	Frequencies (76)	Percentage s
Smoking	They don't smoke	29	38.2
	Sex F does not smoke, Sex M smokes	24	31.6
	Sex F smokes, Sex M smokes.	9	11.8
	Both sexes smoke	14	18.4
Obesity	They are not obese	57	75.0
	Sex F obese, sex M non-obese	4	5.3
	Sex F non-obese, sex M obese	8	10.5
	Both sexes are obese	7	9.2
Malnutrition	They are not malnourished	48	63.1
	Sex F malnourished, sex M not malnourished	13	17.1
	Sex F not malnourished, sex M malnourished	4	5.3
	Both sexes are malnourished	11	14.4

Source: medical records

Table 3 presents the incidence of environmental and occupational factors, as well as chronic poisoning by metals, drugs and derivatives in males, where 17 patients with a tendency to heat exposure were detected (22.4%). Twelve patients were exposed to vibrations (15.8%); six to noise (7.9%); and four to gases (5.3%). 19 patients suffered from chronic poisoning, representing 25% of the total.

Table 3. Incidence of environmental and occupational factors, and chronic poisoning by metals, drugs and derivatives in males.

Variable	Categories	Frequency (76)	Percentage
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Environmental and occupational factors	Does not present this risk factor	37	48.7
	Heat	17	22.4
	Vibrations	12	15.8
	Noises	6	7.9
	Gases	4	5.3
Chronic poisoning by metals, drugs and derivatives	No	57	75.0
	Yeah	19	25.0

Source: medical records

Table 4 shows the female clinical risk factors, where a higher predominance of pelvic inflammatory disease was observed in 16 patients (21.1%), followed by 15 patients with ovulation disorders for 19.7%.

Table 4. Female clinical risk factors.

Variable	Frequency	Percentage
Pelvic inflammatory disease	16	21.1
Ovulation disorder	15	19.7
Infections of the gynecological system	13	17.1
Voluntary termination of pregnancy	10	13.2
Menstrual disorders	9	11.8
Fibromatosis	6	7.9
Endometriosis	3	3.9
Hydrosalpinx	3	3.9
It does not present any risk factors	1	1.3
Total	76	100.0

Source: medical records

As shown in Table 5, the most frequently diagnosed male clinical factors were seminal infection, in 25 patients (32.9%), and the presence of varicocele, in 22 patients (28.9%).

Table 5. Male clinical risk factors.

Variable	Frequency	Percentage
Seminal infection	25	32.9
It does not present any risk factors	25	32.9
Varicocele	22	28.9
Cryptorchidism	4	5.3
Total	76	100.0

Source: medical records

Discussion

The result of the investigation coincides with that of Ramírez - Moran in pointing out a higher incidence in female patients between 25 and 29 years of age, similar to that of Alonso in his study of predisposing factors in the sexual behavior of the couple who states that the highest incidences of infertile women attended in his study were between 25 and 29 years of age. (5,6)

In contrast, Gutiérrez López states in his study that of the 114 couples studied, the highest incidence is between 30 and 34 years with 42.1% of the women studied. In the same way, it differs with the range of patients studied of the male sex, of the 114 patients studied, 42 of them are over 35 years old. (7)

In relation to age, this study differs from the frequency of infertility proposed by Barros Delgadillo and Pereira Calvo in the 35-39 age group, in which they state that many couples postpone motherhood and fatherhood until ages when it is very difficult to conceive, they first seek financial and professional stability and dedicate their most fertile years to this. (8,9)

Infertility has important connotations in the psychic and social order of beings.

humans, and it is not always fully assumed by those who study and attend to it. In the

In the Cuban context, similar to what predominates in other countries, infertility has been addressed from two perspectives: the biomedical and the psychological, focused primarily

on the female population and predominant over the social approach. For many couples, having an infertility diagnosis affects their sexual performance. The pressure to have planned sexual relations, as well as undergoing constant treatments, can lead to feelings of sexual inadequacy and depression, due to the link between sexuality and fertility. (10)

In correspondence with the habit of smoking, this coincides with what Tejera Ruiz proposed in his study of patients with abnormal spermograms, in which he concludes that both smoking and alcoholism reduce the concentration of seminal antioxidants, a fundamental cause of infertility. (11)

Gonzales Sánchez K found in his study that 42.48% of his investigated couples suffered from obesity, which does not correspond with the data obtained in the present investigation; obesity and malnutrition did not constitute a relevant risk factor for not being able to conceive a pregnancy in these couples. (12)

Environmental and occupational risk factors in males showed that of the total number of men studied, none presented this risk factor, however Villaverde de la Parte states that the increase in industrialization and modernization in the last century has left a lasting impact on the introduction of various components in the environment that has finally turned out to be a lasting threat to human reproductive health, so in his study it reveals that exposure to polluting agents such as gases, metals, organic solvents, exposure to the greenhouse effect cause changes in semen quality, spontaneous abortions, fetal death, low birth weight and congenital malformations. (13)

According to Gutiérrez López, in his study of infertility in the niquereña population, vaginal infections constitute the fundamental risk factor in his research, which differs from this study. (7)

Chiriguayo Saltos also agrees with the present investigation in associating pelvic inflammatory disease as a cause of infertility and ectopic pregnancy; 37% of the partners of the women in his study are nulliparous with a history of previous gynecological infections. (14)

Inflammatory and infectious processes of the urogenital tract play an important role in

female and male fertility. The totality of evidence linking *Neisseria gonorrhoeae* and *Chlamydia trachomatis* with infertility is convincing. These microorganisms in men have mostly been associated with asymptomatic infections, and various studies have demonstrated impaired semen quality with reductions of up to 20% in semen parameters, decreased sperm concentration, motility, and morphology. A possible association between disease management trends and reduced reproductive morbidities has been described. It is clear that women who delay seeking care for asymptomatic infections are at greater risk of infertility and other reproductive diseases. (15)

Armas-González in his article on risk factors for male infertility observed that varicocele and testicular surgeries were the pathologies most associated with alterations in the spermogram, coffee and alcohol were the toxic habits most associated with infertility which differs from this research since of the total couples studied 32.9% presented seminal infection followed by varicocele with 28.9%. On the other hand, Gort de Dios states that, despite genetic, environmental, occupational, metabolic risk factors and varicocele, genitourinary infections constitute approximately 15% of infertility cases, so a significant aspect of his study was the elevated leukocyte count in semen in 42.8% of the patients studied. The detection of alterations in seminal parameters in patients who attended infertility consultation may indicate changes in the functional capacity of spermatozoa due to seminal sepsis and increased peroxidation during infection, with corresponding biochemical and molecular changes in the sperm membrane. (16,17)

Moya Robles in his study *Varicocele and Male Infertility* reflects that varicocele is one of the main causes of infertility in men with surgical correction, occurring in 25-40% of men with primary infertility and in 45-81% of men with secondary infertility, so varicocele plays an important role in the issue of male fertility, which coincides with the results of this research, since varicocele occupies second place in male clinical risk factors. (18)

Conclusions

Most members of the infertile couples were between 25 and 34 years old, had completed 12th grade, and were employed. Smoking, malnutrition, and obesity did not contribute significant data; however, in both sexes, infectious causes (pelvic inflammatory disease in women and seminal infections in men) affected the couple, which constitutes the main result of the study.

Bibliographic references

1. Torres Pérez M, Ortiz Labrada YM, Pérez Rodríguez M, Torres Pérez M. Main causes of infertility in couples treated in a municipal clinic, Guillermo Tejas Silva Polyclinic, Las Tunas. Rev. Eugenio Espejo. Faculty of Health Sciences..RRE. 2021; 15(1):30-42.
2. Monzón BG, Marcheco TB. Epidemiology, prevention, diagnosis, and treatment of infertility. Rev Cub Genetica Comunitaria. 2020; 13(3):1-26.
3. Turtos Díaz LM, Díaz Lorenzo TV, Leal Acanda LD. Male infertility and its social impact in Cuba. Caribbean Journal of Social Sciences. 2021; 10(4):39-51).
4. Cuba. Ministry of Public Health. Care for Infertile Couples in Cuba. Methodological Aspects [Internet]. Havana: Editorial Ciencias Médicas; 2021. [cited 01/22/2024]. Available at:<http://www.bvscuba.sld.cu/libro/atencion-a-la-pareja-infertil-en-cuba-aspectos-metodologicos/>
5. Ramirez-Moran AF, Grave-de-Peralta RS, Brooks-Carballo G. Epidemiological-clinical characterization of infertile women. AMC. 2021; 25(3):445-53.
6. Alonso Aguilera M, Rondón Carrasco J, Estrada Pérez A, Gonzales Alonso JL, Pompa Gonzales Y. Characterization of predisposing factors for sexual behavior in infertile couples. Guisa. January-December 2018. Multimed.2020; 24(5):1022-32.
7. Gutiérrez López JI, Rodríguez Reyna R, Garges Espinosa JV, Lanz Rodés A. Infertility, a health problem in the Niquereño population. Multimed. 2021; 25(3):e1404.
8. Barros Delgadillo JC. Age, Infertility, and Reproductive Autonomy. Gynecology and Obstetrics. Mexico. [Internet]. 2024 [cited 21/01/2025]; 92(4). Available

from: <https://www.medigraphic.com/pdfs/ginobsmex/gom-2024/gom244a.pdf>

9. Pereira Calvo J, Pereira Rodríguez Y, Quirós Figueroa L. Infertility and factors that promote its onset. *Rev.méd.sinerg.* 2020; 5(5):e485.
10. Alfonso-Figueroa L, Figueroa-Pérez L, García-Breto L. Infertility: A Perspective from Psychology and Sexology. *Rev Ciencias Médicas* [Internet]. 2023 Dec [cited 23/01/2025]; 27(6). Available from: <http://scielo.sld.cu/pdf/rpr/v27n6/1561-3194-rpr-27-06-e6091.pdf>
11. Tejeda-Ruíz CD, Panizo-Bruzón SE, Blanco-Tejeda A, Sánchez-Cruz Y, Thomas-Santiesteban M. Characteristics of patients with abnormal sperm counts treated at the infertility clinic in Las Tunas. *Rev. electron. Zoilo.* 2022; 47(6):e3236.
12. González Sánchez K, Lesteiro González M, González González D, Pérez Rodríguez ME. Infertility: A Primary Health Care Perspective. *Medimay.* June 15, 2021; 28(2):191-20.
13. Villaverde de la Parte P. The influence of environmental factors on human fertility [Thesis]. Balearic Islands: University of the Balearic Islands; 2020. Available at: <Http://hdl.handle.net/11201/153267>
14. Chiriguayo Santos, Luis Enrique Angulo Mesa, Katherine Stefanie. Pelvic inflammatory disease as a cause of ectopic pregnancy in nulliparous women [Thesis]. Guayaquil: University of Guayaquil; 2022. [cited 08/24/2023]. Available at: <http://repositorio.ug.edu.ec/handle/redug/66120>
15. Parra Zambrano CL. Infertility associated with endometriosis: medical treatment options [Thesis]. Cuenca, Ecuador: Catholic University of Cuenca; 2022. [cited 24/08/2023]. Available at: <https://dspace.ucacue.edu.ec/server/api/core/bitstreams/58c65f58-861b-40d3-a341-7594a66819e4/content>
16. Armas-González E, Mosquera-Escobar M, Alvarez-González K, Rodríguez-Hidalgo M, Duarte-García D, Guerra-Sánchez M. Relationship between male infertility risk factors and sperm count abnormalities. *Rev Ciencias Médicas.* 2022; 26(2):e5500.
17. Gort de Dios E. Semen quality variables and leukocyte presence in infertile patients. *Hatun Yachay Wasi Research Journal.* 2022;1(2);35-42.

18. Moya Robles A, García Vázquez ML, Cisnero Orozco J. Varicocele and male infertility. Sinergia Medical Journal. 2022; 7(5): e799-e80.

Conflict of interest

The authors declare that there are no conflicts of interest for the publication of the article.

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