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Original Research Article

The Main Etiologies of the Infertility of the Couple at the Reference Health Center of Kalaban Coro, Koulikoro (MALI)

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Abstract: The aim was to evaluate the epidemiological and clinical aspects and the main etiologies of the couple's infertility. ***Materials and methods*:** This was a descriptive, cross-sectional, randomized and analytical study with prospective data collection from April 1, 2020 to March 31, 2021, a period of 12 months at the Kalaban-Coro reference health center. ***Result*:** The infertility of the couple remains a major problem with a prevalence of 19.99% and a predominance of the majority of patients were 21-25 years old, a frequency of 27.8%. The majority of spouses were housewives (60.9%), merchants were the most represented among spouses with a frequency of 23.5%. Patients were married 100% of the time and 73.9% were without a co-wife. Secondary infertility was the most prevalent at 64.3%. Palms accounted for 28.7% and nulliparous 48.7%. The history was dominated by hypertension and caesarean section, i.e. 3.5% each. The desire to have a child was found as a reason for consultation in 83.5% of cases and the most represented duration for infertility was between 12-24 months in 57.4% of cases. The patient participation rate was 97.4%. Percentage for spouses it was 13%. Female etiologies accounted for 20.9% (tubal obstruction 7%, PCOS 5.2%, endometriosis 6.2%, polymyomatous uterus 2.6%, uterine synechia 1.7% and anovulation 0.9%) and male etiologies accounted for 46.67% (13.33% azoospermia, oligospermia and asthenospermia, 6.67% asthenospermia). ***Conclusion***: The problem of infertility affects a growing number of couples. It concerns all social strata with a prevalence of 19.99% and a conception of the population that thinks that the etiology is feminine.

Keywords: Profile, Epidemio-clinical, Infertility of the couple.

INTRODUCTION

Transmitting life is one of the deepest aspirations of the human being. The loss of this faculty, beyond moral suffering, is sometimes at the origin of a real existential crisis [1]. Infertility is defined by the World Health Organization (WHO) as the inability of a couple to achieve pregnancy after more than one year of regular, unprotected sex [2]. In humans, fecundability, i.e. the probability of conceiving in each menstrual cycle, averages 25% per cycle at the age of 20. It declines rapidly with age. The cumulative percentage of pregnancy at the population level is currently known as a function of exposure time. Thus, 10% of couples who conceive spontaneously will wait 18 months and by 2 years, 90% of couples will have conceived [3]. If the state of infertility does not present a vital risk unlike a serious disease it nevertheless leads to a deep distress against which the individual will engage in a real struggle with all his available energy. The fear or refusal of this loss of the power to transmit and to be

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part of a history between a past and a future, will invite the patient to consult. Other motivations can obviously be entangled: the search for the experience of motherhood, the realization of a love story between two beings, the desire to live the experience of parenthood etc [1]. It has been and remains a worrying problem for many couples, especially in African countries. Infertility is therefore a public health problem and also a serious social problem. Its discovery is always a psychological trauma for the couple and the consequences can be multiple: a depressive state, sexual disorders, extramarital sexuality leading to divorce and finally an identity crisis [4]. Estimates suggested that between 48 million couples and 186 million people are affected by infertility worldwide [5]. In industrialized countries, 15% of couples consult at least once in their lives for primary or secondary infertility [6]. In France 15 to 25% of couples are affected by infertility [7]. In several countries south of the Sahara (Cameroon, Gabon, Republic, Central African Republic, Democratic Republic of Congo), the frequency of infertility can reach figures greater than 30% [8].

In Mali, a study carried out at the Point G National Hospital found 17% [9]. The etiologies are diverse overall, it is of female origin in a third of cases, male in a third of cases and shared in the last third [3]. Given the increasing place of infertility in the reasons for consultations at the Kalaban Coro Ref SC, as well as the lack of data on the subject; we decided to conduct this study with the following objectives.

OBJECTIVES

The aim was to evaluate the epidemiological and clinical aspects and the main etiologies of the couple's infertility.

MATERIALS AND METHODS

It was a descriptive, cross-sectional, analytical study with prospective data collection from April 1, 2020 to March 31, 2021, a period of 12 months at the Kalaban-Coro reference health center.

Study Opulation: The study involved all patients seen in curative consultation.

Sampling: This was a non-exhaustive sample of all cases of child wishes in the gynaecology-obstetrics department of the CS Ref of Kalaban-Coro during the study period. The reasons for choosing the CS Ref of Kalaban Coro are due to the fact that it is a 1st reference structure not only for patients of about twenty CSCom, but also for some patients from the neighborhoods of Bamako, bordering the health district of Kalaban-Coro but also because of the lack of data in our service.

Inclusion Criteria: All patients who consulted for a child in the gynaecology-obstetrics department of the CS Ref of Kalaban Coro during our study period were included in our study.

Non-inclusion criteria: Patients consulting for desire to have children outside our study period, those without medical records, and those consulting for different reasons of desire for children were not included in our study. The tests studied were socio-demographic characteristics, clinical, biological and radiological data. We developed a questionnaire.

Data collection: The technique consisted of exploiting the consultation files and recording them on a pre-established sheet. Other data carriers were used whenever necessary to clarify or supplement the data collected in the consultation files.

Handling and data processing: The data were entered by the office package 2013 and analyzed by the SPSS software version 26.

Ethical Reflection: Verbal informed consent from patients was requested and obtained before the questionnaire was administered to them. They were informed of the importance of the study. Confidential data has not been taken into account.

Limitations: The very low participation rate of spouses in the study is 13%. The inability of couples to do the additional examinations related to the high blow of these examinations is about 45.2%.

RESULTS

Epidemiological aspects

The prevalence of infertility was 19.99% or 115 cases out of 578 gynecological consultations. The majority of patients were between 21-25 years old, a frequency of 27.8%. For the majority of spouses, age was unknown, at 43.5%. The majority of spouses were housewives, 60.9%. The occupation of spouses: Traders were themost representedwith a frequency of 23.5%. Marital status**:** couples were married 100% of the time. Regarding the nshadow of co-wife: patients without co-wife accounted for 73.9%. These epidemiological aspects are presented in Table 1.

Table 1: The epidemiological aspects of couples received for infertility from 1 April 2020 to 31 March 2021 at the reference health center of Kalaban coro, Koulikoro, Mali

Age	Actual	Percentage	Number of co-spouses	Actual	Percentage
16 – 20 years	21	18,3	**Without a co-wife**	**85**	**73,91**
21 – 25 years	32	27,8	1 co-wife	22	19,13
26 – 30 years	30	26,1	2 co-wives	6	5,22

Age	Actual	Percentage	Number of co-spouses	Actual	Percentage
31 – 35 years	21	18,3	3 co-wives	2	1,74
36 – 40 years	7	6	Profession	Actual	Percentage
41 – 45 years	4	3,5	**Housewife**	**70**	**60,9**
Participation	Actual	Percentage	Student	8	7
Yes	**112**	**97,4**	Nurse	4	3,5
No	3	2,6	Merchant	11	9,6
			Teacher	5	4,3
			Student	3	2,6

Clinical aspects

The paucigestes were the most represented at 28.7%. Nulliparous women were the most represented with 48.7%. patients without children accounted for 50.4%. Spontaneous abortion was found in 17.4%. Induced abortion was found in 1.8% of patients. The HTA was mainly represented i.e. 3.5%. *Caesarean section was the most represented, at 3.5*%. Secondary infertility was the most prevalent at 64.3%. Desire to have children was the most represented at 83.5%. The most represented duration for infertility was between 12-24 months or 57.4%. The patient participation rate was 97.4%, while the spouse participation rate was 13%. Table x 2 and 3 shows these clinical aspects.

Table 2: The clinical aspects of couples received for infertility from April 1, 2020 to March 31, 2021 at the reference health center of Kalaban coro, Koulikoro, Mali [1]

Medical history	Actual	Percentage	Dysmenorrhea	Actual	Percentage
Asthma	2	1,7	**Yes**	**71**	**61,7**
Sickle-cell anemia	1	0,9	No	44	38,3
HTA	5	3,5	Leucorrhoea	Actual	Percentage
None	112	93,9	**Yes**	**78**	**67,8**
Surgical history	Actual	Percentage	No	37	32,2
GEU	2	1,7	Dyspareunia	Actual	Percentage
Caesarean section	4	3,5	**Yes**	**47**	**40,9**
Appendectomy	2	1,7	No	68	59,1
Laparotomy	2	1,7	Total	115	100
Myomectomy	1	0,9	Dysuria	Actual	Percentage
None	**104**	**90,5**	**Yes**	**27**	**23,5**
Menstrual cycle	Actual	Percentage	No	88	76,5
Regular	**102**	**88,7**	Pollakuria	Actual	Percentage
Irregular	12	10,4	**Yes**	**26**	**22,6**
Absent	1	0,9	No	89	77,4
Voiding burning	Actual	Percentage	Reasons for Consultation	Actual	Percentage
Yes	**26**	**22,6**	Pelvic cluster headache plus desire for children	19	16,5
No	89	77,4	**Desire for a child**	**96**	**83,5**

Table 3: The clinical aspects of couples received for infertility from April 1, 2020 to March 31, 2021 at the reference health center of Kalaban coro, Koulikoro, Mali [2]

Waiting period	Actual	Percentage	Deceased child	Actual	Percentage
12-24 months	**66**	**57,4**	0	102	88,7
36 months	19	16,5	**1**	**12**	**10,4**
48 months	11	9,6	2	1	0,9
60 to 72 months	6	5,2	Spontaneous voting	Actual	Percentage
Other	13	11,3	0	80	69,6
Rsexual intake per week	Actual	Percentage	**1**	**20**	**17,4**
1 to 2 times	13	11,3	2	8	7
3 to 4 times	**51**	**44,3**	3	5	4,3
5 to 6 times	50	43,5	4	1	0,9
7 times	1	0,9	5	1	0,9
Gestity(G)	Actual	Percentage	MVA	Actual	Percentage
Nulligeste	32	27,9	0	87	75,7
Primigeste	5	4,3	**1**	**20**	**17,4**
Paucigeste	**33**	**28,7**	2	6	5,2
Multi-gesture	27	23,5	3	2	2,7

Other	18	15,6	ABORTION	Actual	Percentage
Parity	Actual	Percentage	**0**	**113**	**98,2**
Nulliparous	**56**	**48,7**	1	1	0,9
Primiparous	24	20,9	2	1	0,9
Paucipare	28	24,3	BMI	Actual	Percentage
Multiparous	7	6,1	Normal	92	80
Living child	Actual	Percentage	Thinness	6	5,2
0	**58**	**50,4**	Overweight	7	6,1
1	26	22,6	**Obese**	**10**	**8,7**
2	19	16,5	Blood pressure	Actual	Percentage
3	5	4,4	Normal	111	96,5
4	6	5,2			
6	1	0,9			

The biological, radiological exploration balance and the main etiologies selected:

Ultrasound

Pelvic ultrasound was normal in 29.6%. Ovarian dystrophy was found in 12.2%, adenomyosis in 5.2%, polymyomatous uterus in 2.6% and ovariancysts in 2.5% of cases.

Hysterosalpingography

In 7.8% *the tubes were* permeabcompared to 6.9% tubal obstruction s and 0.9% uterine synechia.

The main bacteria isolatedfrom urine cytoberiologic examination (ECBU) and vaginal sampling are *Escherichia coli, Klebsiella pneumoniae, Gardenella vaginalis and Ureaplasma ureticum.*

Eminine fetology etiologies: female etiologies accounted for 20.9% (tubal obstruction 7%, PCOS 5.2%, endometriosis 6.2%, polymyomatous uterus 2.6%, uterine synechia 1.7% and anovulation 0.9%).

Male etiologies

Male etiologies accounted for 46.67% (13.33% azoospermia, oligospermia and asthenotheratospermia, 6.67% asthenospermia). The various results of the biological, radiological exploration balance and the main etiologies selected are presented in tables 5, 6 and 7.

Table 5: Hormonal balance and imaging

Ultrasound result	**Actual**	**Percentage**	**WHA**	**Actual**	**Percentage**
Normal	34	29,6	**Normal**	**2**	**1,7**
Ovarian dystrophy	**14**	**12,2**	Low	1	0,9
Adenomionic uterus	6	5,2	Not done	42	36,5
Polymyomatous uterus	3	2,6	Not requested	70	60,9
Not done	52	45,2	LH	Actual	Percentage
Body fibroma	1	0,9	Normal	6	5,2
Functional cyst	5	4,3	High	1	0,9
Hysterosalpingography	Actual	Percentage	**Not done**	**107**	**93**
Retained permeability	**9**	**7,8**	Not requested	1	0,9
Tubal obstruction	8	6,9	Oestradiol	Actual	Percentage
Circumferential cervicoisthmic narrowing	1	0,9	Normal	6	5,2
Corneal and cervico-isthmic synechia	1	0,9	High	1	0,9
Not done	96	83,5	**Not done**	**107**	**93**
ECBU	Actual	Percentage	Not requested	1	0,9
Sterile	4	3,5	FSH	Actual	Percentage
Escherichia coli	1	0,9	Normal	5	4,4
Klebsiella pneumoniae	1	0,9	High	2	1,7
Not done	32	27,8	**Not done**	**107**	**93**
Not requested	77	66,9	Not requested	1	0,9
PV	Actual	Percentage	Progesterone	Actual	Percentage
Sterile	10	8,7	Normal	6	5,3
Escherichia coli	4	3,5	Not requested	2	1,7
Klebsiella pneumoniae	3	2,6	**Not done**	**107**	**93**
Gardenella vaginalis	2	1,7	Prolactin	Actual	Percentage
Ureaplasma ureticum	2	1,7	Normal	5	4,4
Not done	84	73	**High**	**4**	**3,5**

Not requested	10	8,7	Not done	104	90,4
			Not requested	2	1,7
			TSH_{US} and T4 Libre	Actual	Percentage
			Normal	1	0,9
			Not requested	111	96,5
			Not done	**3**	**2,6**

Table 6: Distribution of patients by type of infertility

Type of infertility	Actual	Percentage
Primary	**48**	**41,7**
Secondary	**69**	**58,3**
Etiology selected	Actual	Percentage
Tubal obstruction	**8**	**7**
PCOS	6	5,2
Endometriosis	3	2,6
Polymyomatous uterus	3	2,6
Uterine synechia	2	1,7
Anovulation	1	0,9
Unknown	**91**	**79,1**
Reserve depletion follicular	1	0,9

Table 7: Data on spouses of couples received for infertility from April 1, 2020 to March 31, 2021 at the reference health center of Kalaban coro, Koulikoro, Mali

Joint participation	Actual	Percentage	Testicular echodoopler	Actual	Percentage
Yes	**15**	**13**	Epididymal cephalic cyst and bilateral hydrocele	1	0,9
No	100	87	Not done	11	9,6
Age spouses	Actual	Percentage	Not requested	103	89,5
28-32 years	**20**	**17,4**	Total	115	100
33-37 years	19	16,5	Etiologies retained by spouses	Actual	Percentage
38-42 years	10	8,8	Normal	8	7
43-47 years	6	5,2	**Azoospermia**	**2**	**1,7**
48-52	5	4,3	**Asthenoteratospermia**	**2**	**1,7**
Unknown	**50**	**43,5**	**Oligoasthenospermia**	**2**	**1,7**
Other	5	4,3	Asthenospermia	1	0,9
Profession	Actual	Percentage	Not done	100	87
Merchant	**27**	**23,5**	Spermogram	Actual	Percentage
Expatriate	11	9,6	Normal	8	7
Worker	9	7,8	Azoospermia	2	1,7
Traditional gold miner	6	5,2	Asthenoteratospermia	2	1,7
Farmer	5	4,3	Oligoasthenospermia	2	1,7
Driver	4	3,5	Asthenospermia	1	0,9
Other	53	46,1	Not done	100	87
Medical history	Actual	Percentage	Total	115	100
Unknown	**100**	**87**	Not done	100	87
None	15	13	Surgical history	Actual	Percentage
Toxic consumption	Actual	Percentage	**Unknown**	**100**	**87**
Alcohol	**1**	**0,9**	None	15	13
Unknown	99	86,1	BMI	Actual	Percentage
None	15	13	Unknown	100	87
Types of infertility	Actual	Percentage	Normal	15	13
Primary	41	35,7			
Secondary	**74**	**64,3**			

DISCUSSION

In the literature, the prevalence of infertility of the couple varies. We estimated this prevalence at 19.99% on all gynaecological consultations combined, i.e. 115 couples out of 578 consultations. This result is comparable to that of GUINDO P [18] (2019) in Mali

which found 19% and higher than those of KOUYATE F.I [19] in Mali and WEMBULUA SHINGA B in DRC [20] which found respectively 12.7% and 16.1% but are lower than that of TRAORE S [21] which found 23.6%.

Epidemiological aspects

The majority of patients were between 21-25 years old, a frequency of 27.8%. This result is lower than those of GUINDO P [18], KOUYATE F.I [19] and TRAORE F B [23] which respectively found 76.6% for 21-35 years, 81% for 18-32 years and 34.5% for 25-29 years. This difference in outcome could be explained by the difference in age range between studies.

For the majority of spouses, age was unknown, at 43.5%. This result is different from those of KOUYATE F.I [19] and ONGOIBA A M [24] which found respectively 61.9% for 33 to 45 years and 53.3% for 25 to 35 years. This difference in result is explained by the lack of knowledge of the age of the spouses by the spouses. The majority of spouses were housewives, 60.9%. This result is comparable to that of KOUYATE F. I [19] which found 59.6% of housewives (2009), lower than those of WEMBULUA SHINGA B [18], TRAORE F B [23] and ONGOIBA A M [24] which found housewives in respectively 84.3%, 72.4% and 64.5% on the other hand higher than that of GUINDO P (2019) [18] which recovered 50.6%. This could be explained by the fact that after marriage the majority of women devote themselves to household chores. The occupation of spouses: Shopkeepers were the most represented with a frequency of 23.5% this result is similar to that of TRAORE F B [23] which found 23.5% of (tradesman, civil servant and worker), different from that of KOUYATE F.I [19] which found 24.6% of civil servants. This could be explained by the fact that the vast majority of male workers in our context are either shopkeepers, workers or civil servants.

Marital status

Couples were married in 100% of cases, this result is comparable to that of ONGOIBA A M [24] (2008) which found 99.6% of married and higher than those of GUINDO P [18] and KOUYATE F I [19] which recovered respectively 97.5% (2019) and 91.8% (2009). These results could be explained by society's negative perception of a child coming out of wedlock.

Regarding the number of co-spouses

Patients without co-spouses accounted for 73.9%. This result is comparable to that of COULIBALY H B (2009) [22] which recovered 72.7%, higher than those of KOUYATE F. I [19] and TRAORE B which recovered respectively 69.1% and 67.1% and lower than that of ONGOIBA A M (2008) [24] which recovered 80.4%. This could be explained by the high prevalence of monogamous marriages in the country.

Clinical aspects

O stetrical interests

The paucigestes were the most represented at 28.7%. This result is different from those of GUINDO P [18] (2019), KOUYATE F. I [19] (2009) and TRAORE F B [23] (2010) which found nulligestes with respectively 40.4%, 39.8% and 56.4%. This could be explained by the speed of consultations for the desire for a child. T he nulliparous were the most represented with 48.7% this result is lower than those of TRAORE F B [23], TRAORE S [19] and GUINDO P [18] which recovered respectively 54.3 %, 63.9% and 57.9% but higher than that of ONGOIBA A M [24] which found 44.9%.

The shadow*of a living child*

Patients without children accounted for 50.4%. This result is similar to that of ONGOIBA A M [24] (2008) which recovered 50.6% and lower than that of GUINDO P [18] (2019) which found 64.1% for patients without a live child. This result could be explained by the strong growth of nulligestes to consult for desire for children.

Spontaneous abortion

Spontaneous abortion was found in 17.4%. This result is comparable to those of KOUYATE F. I [19] (2009) and TRAORE F B [23] (2010) which recovered 17.7% and 17.6% respectively. On the other hand, higher than that of GUINDO P [18] which recovered 11.3%.

Induced abortion

Induced abortion was found in 1.8% of patients this result is much lower than those of GUINDO P [18] (2019) and ONGOIBA A M [24] (2008) which recovered respectively 6.2% and 38.8%. These results could be explained by a gradual decrease in cases of induced abortion.

Medical history

HTA was mainly represented or 3.5%. This result is lower than those of KOUYATE F. I [19], GUINDO P [18] which found respectively 5.2%, 4.8%. This result could be explained by the fact that most of the medical history in our context is discovered after a complication.

Surgical history

Caesarean section was the most represented at 3.5%. This result is comparable to that of GUINDO P [18] and KOUYATE F. I [19] which found respectively 3, 1 and 5.6%.

Infertility peak

Secondary infertility was the most represented, at 64.3%. These results are higher than those of GUINDO P [18] and KOUYATE F. I [19] which respectively found 59.6%, 45% against against lower than that of ONGOIBA A M [24] which found 69.9%.

Consultation methods

The desire to have children was the most represented with 83.5%. This result is similar to that of WEMBULUA SHINGA B **[**20] which recovered 83.8% (2012) and higher than those of TRAORE F B (2010) [23] and ONGOIBA A M (2008) [24] which recovered respectively 67.7% and 38.8%.

These differences in outcome could be explained by the presence of other signs such as pelvic pain that mask the desire to have a child during consultations for a child.

Infertilityurea

The most represented duration for infertility was between 12-24 months or 57.4%. This result is different from those of GUINDO P [18] (greater than 2 years in 97.2% in 2019), KOUYATE F. I [19] (less than or equal to 5 years in 40.4% in 2009), and COULIBALY H B [22] (2 to 4 years in 45.4 % in 2009).

This disparity in results could be explained by the inequality related to the distribution of age groups in the different studies.

Participation Rate

The participation rate of female patients was 97.4% while that of spouses was 13%. This result is comparable to that of WEMBULUA SHINGA B [20] (2012 in DRC) which found that women initiate consultations in 93.1%.

The biological, radiological exploration balance and the main etiologies selected:

Ultrasound

Ovarian dystrophy was found in 12.2% and ovarian cyst in 2.5% of cases. This result is higher than that of GUINDO P [18] (2019) which found 8.2% and 10.2% ovarian cyst.

Hystero-salpingography (HSG)

Conserved patency in 7.8% and tubal obstruction in 6.9% and uterine synechia in 0.9%. These results are different from those of GUINDO (2019) P [18] which found 95.5% conserved permeability and uterine synechia in 0.3%. These differences could be explained by the absence or non-realization of HSG in 83.5% of the cases in our study.

The main bacteria isolated in cytoberiologic examination of urine (ECBU) and vaginal sampling are *Escherichia coli*, *Klebsiella pneumoniae*, *Gardenella vaginalis and Ureaplasma ureticum.*

Eminine fetology etiologies

Female etiologies accounted for 20.9% (tubal obstruction 7%, PCOS 5.2%, endometriosis 6.2%, polymyomatous uterus 2.6%, uterine synechia 1.7% and anovulation 0.9%). These results are different from that of KOUYATE F.I [19] which found the pathology (ovarian 32.4%, uterine 19.6%, tubal 10.8%).

Maculine Etiologies

Male etiologies accounted for 46.67% (13.33% azoospermia, oligospermia and asthenotheratospermia, 6.67% asthenospermia). This result is higher than that of KOUYATE F. I. (2009) [19] which recovered 26.3% and lower than that of COULIBALY H. B (2009) [22] and WEMBULUA SHINGA B [20] (2012 in DRC) which found respectively 47.7% and 91.3%. This disparity in results could be explained by the low participation rate of spouses in the study, a frequency of 13%.

CONCLUSION

The problem of infertility affects a growing number of couples. It concerns all social strata with a prevalence of 19.99% and a conception of the population that thinks that the etiology is feminine.

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