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Causes and prevalence of factors causing secondary infertility

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بسم الله الرحمن الرحيم

قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا *إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ*

صدق الله العظيم

سورة البقرة , الاية 32

Dedication

This research is lovingly dedicated to our respective parents , who have taught us to think, understand and express. I earnestly feel that without their inspiration, guidance and dedication, we would not be able to pass through the tiring process of this years
To our doctors, who without their guidance , support and love , we wouldn’t pass this challenging years .and most of all to the Almighty Allah who give us strength and good health while doing this.

Content

Pages	Content	
3	ABSTRACT	
5	introduction	1
6	causes of secondary infertility	1-1
6	the most common causes of infertility for male	1-2
8	investigation for infertility males	1-3
9	investigation for infertility of females	1-4
10	treatment options for women include	1-5
11	Patients and method	2
12	results	3
18	discussion	4
19	REFERENCES	5

ABSTRACT

Background:

Infertility is a reproductive health problem which affects not only individuals ,families and social populations. Secondary infertility means an inability to conceive or carry a baby to full term after having conceived naturally and given birth in the past. The cause of secondary infertility can be traced to either partner.

Objective:

The aims of this current study were to study the causes of infertility and to calculate the proportion of the individual factors contributing to it.

Patients and method:

The current study included eighty -five infertile couples participants with secondary infertility , who came for infertility evaluation and treatment at Bint-Alhuda teaching hospital and Infertility -unit AL- Nasiriya teaching hospital, for period from Augst -2023 to end of march -2024 using structured questioners. Cause of infertility in the couple was assigned on the basis of history and examination findings. The percentage of each cause was evaluated.

Results

This study shows seventy infertile couples within cause for secondary infertility either only women or men or both. Fifteen infertility couples are unexplained without any cause. The highest proportion of secondary infertility is seen among aging group within 25-35 years for women (57.65%), while for male about (51.76%) within age group more than 35years. Age group for women participated from 20 to 44 years ,while for males from 20 to 48 years. the main cause of second infertility for women is due to polycystic ovarian syndrome (no.=49;70%), while fifty-two males of infertile couple within normal.

Conclusion:

This study explains most common cause of secondary infertility of infertile couples (no.=85) related to women. Fifteen couples was diagnosed as unexplained infertility. Number of female partner with cause for secondary infertility was (no.=64), the main cause of second infertility for women is due to polycystic ovarian syndrome (no.=52%), while fifty-two males of infertile couple within normal.

1- INTRODUCTION

Infertility is a condition where inability to get pregnant after one year of trying to conceive. Causes of infertility can include ovulatory disorders, endometriosis, low sperm count or low testosterone. The risk of infertility increases as you age. Many treatment options are available for people with infertility [1]. What is secondary infertility Secondary infertility is when you're unable to get pregnant or carry a pregnancy to term after previously giving birth. To classify as secondary infertility, the previous birth must have occurred without help from fertility medications or treatments, like in vitro fertilization (IVF). Healthcare providers typically diagnose secondary infertility after a couple tries to conceive for six months to a year [2]. The global prevalence of secondary infertility during 1990 to 2010 were reported in one study to be between 8.7-32.6% [3]. Another study estimated the prevalence to be within the range of (7.2-18%) in 2009-2010 [4].

1-1 Causes of secondary infertility for female included:

Maternal age (35 years or above): A woman's fertility starts to decline after age 30 years. Polycystic ovary syndrome (PCOS): This hormonal disorder causes high levels of male sex hormones and prevents regular ovulation and

menstruation. Excessive weight gain: Weight gain can lead to ovarian dysfunction in some women Endometriosis: This condition means tissue resembling the uterus lining grows in parts of the body outside the womb. It can create problems getting and staying pregnant. Blocked fallopian tubes: The tube which carries eggs from the ovaries to the uterus can become, blocked due to pelvic infections like chlamydia or gonorrhea [5].

1-2 The most common causes of infertility for male are the following:

1.Varicocele

This condition is responsible for 1 in 5 male secondary infertility cases. A condition caused by distended veins, varicocele causes swelling in the scrotum, which in turn, prompts a rise in temperature inside the testicles. A heated environment can be deadly for sperm, causing them diminish and die

2.Injury to the penis or testicles can lower sperm production and quality, leading to unhealthy infertility.

3. Cancer Therapy

Radiotherapy and chemotherapy can seriously compromise sperm quality and count.

4.Habits: like Tobacco, drugs and alcohol

5.exposure to toxins

Lead-laden products, pesticides, harmful chemicals and radiation are vicious for sperm.

6.Stress

Stress can unleash a torrent of setbacks premature age lines, insomnia, chronic anxiety and perhaps worst of all, infertility

7. Obesity

Obesity, overweight and type 2 diabetes are common causes of infertility [6].

Female risk factors were irregular menstrual cycle, light menstrual blood volume, history of cervicitis and endometriosis, previous stillbirth and miscarriage and history of operation [7].

Research at a rural site of Northern China showed that risk factors for infertility included body mass index (BMI), state of exercise, amount of menstrual flow, and number of pregnancies and abortions [8]. Another research enrolled 2151newly married couples in rural region of northern China and found that hepatitis B, epilepsy, diabetes, passive smoke and overweight were associated with infertility [9]. A large-scale community-based study which recruited 12,964 women aged 18–49 years in China reported that women with oligomenorrhea had higher prevalence of infertility [10]. Another study reported that increasing age at menarche was associated with infertility [11]. Several studies also focused on the detrimental effects of risk factors for male infertility on the protein composition of sperm. Indeed, in addition to diseases, more and more factors are highlighted for their negative impact on male reproductive potential [12]. diet, caffeine intake, weight, physical activity, psychological impact (e.g., stress), smoking, drug or alcohol use, medication, diabetes, exposition to synthetic chemicals, clothing, sleep, etc., can cause fertility impairment [13].

1-3 Investigation for infertile males:

1.Semen analysis. Semen samples can be obtained in a couple of different ways, can provide a sample by masturbating and ejaculating into a special container at the doctor's office. Because of religious or cultural beliefs, some men prefer an alternative method of semen collection. In such cases, semen can be collected

by using a special condom during intercourse. The sample of semen is then sent to a laboratory to measure the number of sperm present and look for any abnormalities in the shape (morphology) and movement (motility) of the sperm. The lab will also check it for signs of problems such as infections, counts of sperm cell fluctuate significantly from one specimen to the next. In most cases, several semen analysis tests are done over a period of time to ensure accurate results. If your sperm analysis is normal, your doctor will likely recommend thorough testing of your female partner before conducting any more male infertility test.

2. Scrotal ultrasound. This test uses high-frequency sound waves to produce images inside your body A scrotal ultrasound can help your doctor see if there is a varicocele or other problems in the testicles and supporting structure.

3. Transrectal ultrasound: for examine the prostate.

4.Hormone testing. Hormones produced by the pituitary gland, hypothalamus and testicles play key role in sexual development and sperm production.

A blood test measures the level of testosterone and other hormones. Post-ejaculation urinalysis. Presence of sperm in urine can indicate that sperm cells are traveling backward into the bladder instead of out your penis during ejaculation (retrograde ejaculation). Genetic tests. When sperm concentration is extremely low, there could be a genetic cause. A blood test can reveal whether there are subtle changes in the Y chromosome — signs of a genetic abnormality. Genetic testing might be ordered to diagnose various congenital or inherited syndromes.

5.Testicular biopsy. This test involves removing samples from the testicle with a needle. If the results of the testicular biopsy show that sperm production is normal, so that the problem is likely causing specialized sperm by a blockage or another problem with sperm transport function tests. A number of tests can be used to check how well vitality of sperm after ejaculation, how well they can penetrate an egg, and whether there's any problem attaching to the egg. These

tests aren't often used and usually don't significantly change recommendations for treatment [14].

1-4 Investigation for infertile female:

1.Hormonal analysis

2. Hysterosalpingography : checks on the condition of the uterus and fallopian tubes. It also looks for blockages in the fallopian tubes or other problems. Special dye is injected into the uterus, and an X-ray is taken

3. Ovarian reserve testing. This helps your care team find out how many eggs you have for ovulation. The method often begins with hormone testing early in the menstrual cycle. Other hormone tests. These check the levels of hormones that control ovulation. They also check pituitary hormones that control processes involved in having a baby.

4.Pelvic ultrasound looks for diseases of the uterus or ovaries. Sometimes a test called a saline infusion sonogram is used to see details inside the uterus that can't be seen on a regular ultrasound. Another name for the saline infusion test is a Sono hysterogram.

Rarely, testing may include:

1.Hysteroscopy. Depending on your symptoms, your health care team may use a hysteroscopy .During the procedure, a thin, lighted device is placed through the cervix into the uterus to check for any irregular signs. It also can help guide minor surgery

2.Laparoscopy. involves a small cut beneath the navel. Then a thin viewing device is placed through the cut to check the fallopian tubes, ovaries and uterus. The procedure may find endometriosis, scarring, blockages or other issues with the fallopian tubes It also might find treatable problems with the ovaries and uterus. Laparoscopy is a type of surgery that can treat certain conditions as well. For example, it can be used to remove growths called fibroids or endometriosis tissue [15].

1-5 Treatment options for women include

Fertility medications

The main treatment for females with ovulation problems involves clomiphene as well as injections of follicle stimulating hormone and luteinizing hormone. Clomid induces ovulation, while the injections mature eggs and induce ovulation Fertility medications like clomiphene and other hormonal medications may also help males with fertility issues due to hormone imbalance

-Surgery

Surgery for females may remove fibroids, endometrial growths, scarring, or uterine polyps. In some cases, doctors may consider surgery to open a blocked fallopian tube [16].

Treatment options for men

Include:

-Intrauterine insemination (IUI) is a procedure in which sperm is inserted directly into a woman's uterus, often used when men have low sperm count or poor sperm quality (this is also an option for women with unreceptive cervical mucus.

Testicular surgery can repair testicular varicocele, a condition that can affect sperm quality and count. Supplements like antioxidant and anti-aging supplements can increase fertility in men while drug treatment can improve semen quality. Lifestyle-related infertility, such as infertility caused by weight gain, can be reversed using weight management strategies [17].

AIMS:

The aims are to determine what are the most common causes and prevalence of factors causing secondary infertility.

2- PATIENTS and METHOD:

The study included eighty -five participants infertile couples with secondary infertility, who came for infertility evaluation and treatment at Bint-Alhuda teaching hospital and Infertility -Unit AL- Nasiriya teaching hospital, for period from Augst -2023 to end of February -2024 using structured questioners. Causes of infertility assigned on the basis of history and examination findings. The prevalence of each cause was evaluated.

The information obtained includes the following:

For females:

Age of patient, occupation, parity, age of married, type of delivery (NVD, C/S) and cause of C/S, female disease (PCOS, endometriosis, uterine fibroids, blocked fallopian tubes ...) history of contraceptive and duration.

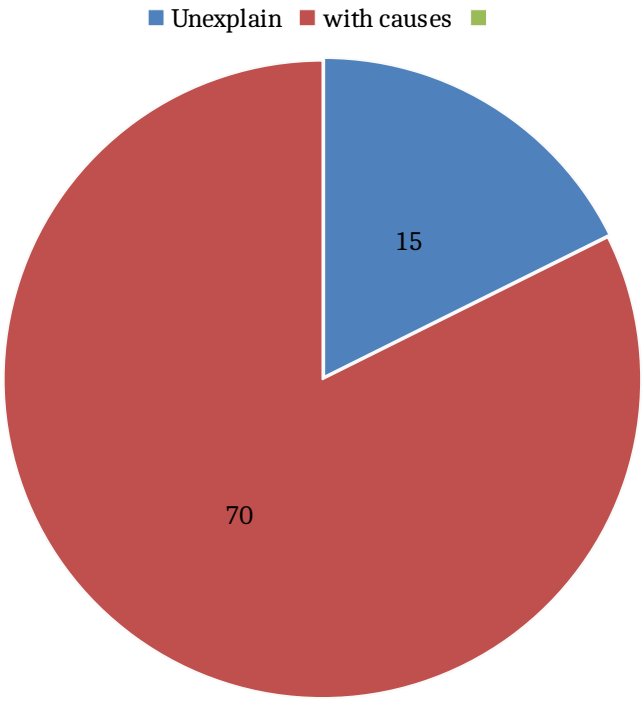
Duration of infertility.

-Male: age, occupation, history of smoking, history of varicocele, surgery, relative or not and degree of relative.

3- RESULTS

Eighty -five infertile couple were involved in the present study. Table-1- clarify the basic demographic characteristic related to female partner of infertile couples with secondary infertility, within age group (20-44 years). Highest proportion (57.65%) of secondary infertility is seen among women aged 25-35 years, while the highest percentage of women within age group 20-30 years at time of marriage. According to parity, fifty-three of participants women had number of children from one to three.

Women with secondary infertility are delivered by caesarean - section about (No.=44; 51.67%), main causes of C/S are cephalopelvic disproportion and failure to progress.



Causes secondary infertility for both couple

Table-1- Basic demographic characteristic related to female partner with secondary infertility

Characteristics	Number (No.)	percentage (%)
Age (years)		
<25	11	12.94%
25-35	49	57.65%
>35	25	29.41%

Age of marriage(years)		
<20	39	45.88%
20_30	41	48.24%
>30	5	5.88%
Parity		
1_3	53	62.35%
≥3	32	37.65%
Type of delivery		
C/S	44	51.76%
NVD	41	48,23%
Causes of c/s		47.72%
Cephalopelvic disproportion	21	13,63%
Failure to progress	6	11,36%
Hypertension	5	27,27%
Others	12	
Occupation		

Housewife Officer	71 14	83.53% 16.47%

Table-2- Shows the basic demographic characteristic for male partner of infertile couples with secondary infertility ; men within age group from (20-48) years old, the highest percentage of males involved in this current study within age 25-35 years (45.88%). According to the sort of occupation of males, were most of them are free worker about (48.88%).

Regarding the history of smoking, 45 of males are non-smoker, however, forty men participants in this study are smoker; the number and percentage of men smoking more than 20 cigarette per day , approximately (No.=22, 55%).

Table-2- Basic demographic characteristics for male partner of infertile couples

Characteristics	Number (No.)	Percentage (%)
Age (years)		
<25	2	2.35%
25_35	39	45.88%
>35	44	51.76%
Occupation		

Free worker	41	48.88%
Solider	25	29.41%
Officer	18	20.47%
Baker	1	1.18%
History of smoking		
No	45	52.94%
Yes	40	47.06%
<20 cigarette	7	17.5%
>20 cigarette	22	55%
Hookah	11	27.5%

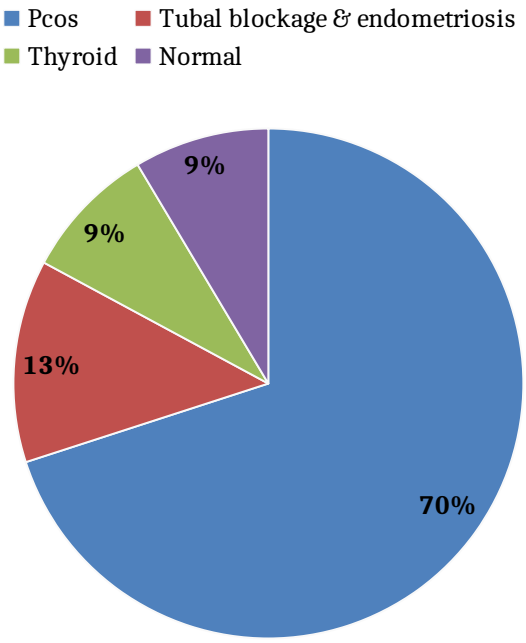
This study clarifies that the most common cause of secondary infertility for studied group related to women (no.=70), while fifty-two of men involved in this study are normal. The number and percentage of unexplained infertility were (no.15; 17,64%), infertile couples complain from secondary infertility without any obvious cause. According to main cause among women in this study is polycystic ovarian syndrome (no.49, 57,64%)

Regarding the duration of infertility between one to more than seven years. The highest percentage of infertile couples (47.67%) involved in this study was within duration from 4-6 years, as shown in the table-3.

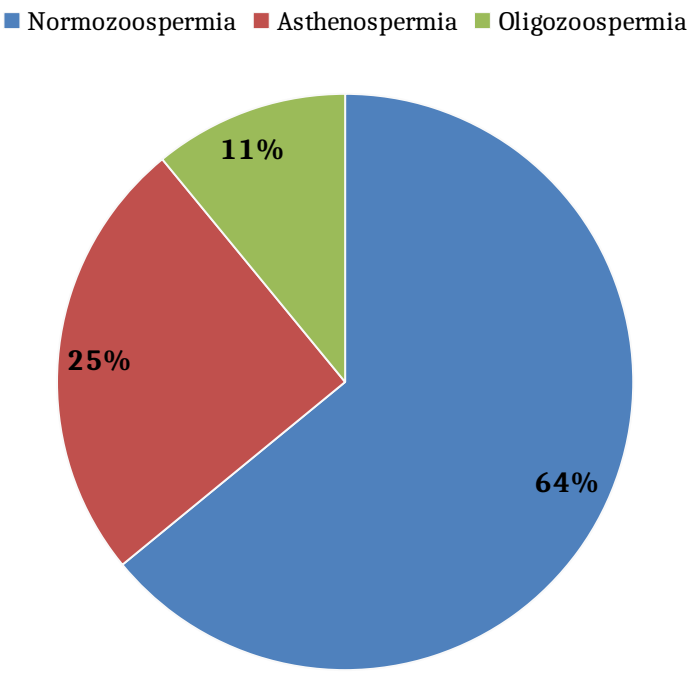
Table-3-Causes and duration of infertility among studied infertile couples (No.=85).

Causes and duration of infertility	Number (No.)	Percentage (%)
Duration of infertility(years)		
1-3	27	31.76%
4-6	41	48.23%
≥7	17	20 %
Causes of infertility (female partners)	**(70)**	**82,35%**
PCOS	49	70%
Tubal blockage &endometriosis	9	12,85%
Thyroid disorder	6	8,57%
(Normal)	**6**	**8,57%**
Causes of infertility (male partners)	**(70)**	**82,35%**
(Normozoospermia)	**52**	**74,28%**
Asthenozoospermia	9	12,85%
Oligozoospermia	9	12,85%

Unexplained infertility	**15**	**17,64%**



Causes of secondary infertility in females



Causes of secondary infertility in males

4-DISCUSSION

Infertility can be either primary or secondary. Primary infertility is defined as the inability of a female to establish clinical pregnancy or carries a pregnancy to live birth. The most common form of female infertility worldwide is secondary infertility, it represents the female who has unable to establish clinical pregnancy or carry pregnancy to alive birth 12 months after the last pregnancy which had led to live birth [18].

The average age of the female partners attended the infertility unite is 28 years. The average age of the husbands was found to be 33 years. Furthermore, as the age of marriage increases, the incidence of infertility increases [19]. Female age is the most important determinant of spontaneous as well as pregnancies from assisted reproduction. Fecundity starts declining in the fourth decade and fertility starts declining as early as 32 years, and hence, late childbearing is often defined after the age of 35 years[9].

Among the causes of female infertility found, PCOS was the most common causes contributing 70 %, to all cases attributed to female infertility. Studies done by Mittal et al.in Haryana, Patel et al. in Indore, and Rajashekar et al. in Bangalore also show that the main female factor causing infertility is PCOS. Studies done worldwide also prove that PCOS is the single most common cause of female factor of infertility, they needed some form of ovulation induction and sometimes intrauterine insemination for conception. This implies that lean PCOS patients also suffer from some form of infertility [20]. A study found that at least 30 million men worldwide are infertile and the highest rates in Africa and Eastern Europe. Infertility in men can be caused by different factors and is typically evaluated by semen analysis. Semen analysis is performed to assess the number of sperm (concentration), motility (movement), and morphology (shape). Infertility in men can be classified into disruption of testicular or

ejaculatory function, hormonal disorders, and genetic disorders. Additional tests could be used, such as scrotal ultrasound, hormonal testing, post ejaculation urine analysis or retrograde ejaculation, testicular biopsy, and genetic testing [21].

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