THE RATIO BETWEEN PRIMARY INFERTILITY TO SECONDARY INFERTILITY IN THE INFERTILE FEMALE IN THE PERIOD BETWEEN 2015 TO 2020 IN BAGHDAD AL-KARKH.

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Abstract:

Infertility in the field of reproductive health is implies a deficiency that does not compromise the individual physical integrity nor is it life-threatening, but such deficiency might negatively affect the development of the individual, bringing about defeat and weakening the personality, as most couples consider having kids as a vital objective. As one of each seven couples suffers from some degree of infertility which known as subfertility and they need specialist help to conceive, which can be either primary or secondary infertility.

The current study was carried out in two of infertility centers ,the High Institute of Infertility Diagnosis and Assisted Reproductive Technologies \ AL- Nahrain University and Um Al-Baneen of infertility center at Baghdad-Iraq, as these centers entice the most of infertile capsules in al Karkh side of Baghdad, and the total number of infertile female was 1724 joined in assisted reproductive technology programs to enter ICSI cycle at these tow centers throughout the period from (February /2015- December /2020) with females age divided to sub groups (each 5 years together) ,it was ranged from (12-50) in these 6 years.

As observed in this study, primary infertility and secondary infertility in female were related to several demographic characteristics and medical factors and females age, environments had a significant influence to accentuate the severity of secondary infertility.

Keywords: Infertility, female, primary infertility, secondary infertility.

Introduction:

Infertility evaluation is indicated in females with unproductive pregnancy after 12 months of unprotected steady intercourse or 6 months if women are above 35 years old (1). Infertility is a common problem affecting couples in age of reproduction, as a medical condition it is may cause psychological, physical, emotional, and medical detriments to the patient, this medical condition involves affecting both the couples and the patient's mate as a couple (2).

Infertility can be defined as the incapability to achieve pregnancy after reasonable time of sexual intercourse without contraceptive trials taken, about (40%) of infertile couples exhibit a combination of infertility factors and about (15 %) of couples may not show any objective alteration leading to a certain diagnosis (3). One of each seven couples suffers from some degree of infertility which known as subfertility and they need specialist help to conceive, which can be either primary or secondary infertility. As primary infertility is a retard for a couple who have had no previous pregnancies(4). while, couples with a previous pregnancy even once, whether it ends

with the abortion or finished with the birth of a live or dead fetus , and failed to conceive during a year and a half of unprotected intercourse, it is called secondary infertility (5).

Most of the infertile couples have one of three of the main causes including an ovulatory dysfunction, tubal-peritoneal cause or male factor,and both of them are responsible for the infertility causes equally (6).

Infertility in the field of reproductive health is implies a deficiency that does not compromise the individual physical integrity nor is it life-threatening, but such deficiency might negatively affect the development of the individual, bringing about defeat and weakening the personality, as most couples consider having kids as a vital objective (7).

Epidemiology:

Infertility is a complex disorder with significant medical, psychosocial, and economic problems , data from population based studies suggest that 10-15 % of couples in the world experience infertility (8). The product or output of reproduction indicates fertility , rather than the capability to have children. The physiological ability to have kids that is manifest roughly in the period between menarche and menopause in women is termed fecundity (9).

Demographers define a third, further aspect of reproduction fecund ability which is the chance of becoming pregnant, or the likelihood of exposure to the possibility, that depends on the pattern of sexual and pregnancy preventive behaviors (9). An inability of women with reproductive age (15-49 years) to become or remain pregnant within five years of exposure to pregnancy, inability to become pregnant with a live birth, within five years of exposure based upon a consistent union status, lack of contraceptive use, not lactating and maintaining a desire for a child(10).

Infertility Risk Factors and Causes:

The causes of female infertility are many problems as medical condition that may damage the fallopian tubes and the uterus, disorders of menstruation, sexual disorders, age, ovarian failure and environmental factors (11). Female infertility is a complex problem that should be considered carefully by the government and stakeholders in each country and especially by those countries with demographic problems, in order to find effective interventions and solutions (11).

Environment

The importance of environmental factors as a cause in infertility has been stressed (12). Many toxins such as glues or volatile organic solvents , silicones, chemical dusts, physical agents and pesticides are implicated in infertility (13). Other potentially harmful occupational chemical environmental exposures have also been discovered to be related with the increased link of spontaneous miscarriage in women such as chlorinated hydrocarbons and fumicides (12). Estrogen-like hormone-disrupting substances such as phthalates are of specific concern for effects on women babies, hence individuals having direct contact with or exposure to chemicals have high chances of having primary infertility or secondary infertility as the case may be (8). Studies hypothesize that environmental factors can alter or effect on persons reproductive tissue and thus affect couples conceive ability or having a healthy offspring(14).

Age

In most countries, the average age of first pregnancy has increased since the 1980s ,this delay in childbearing has been attributed to the alterations in women's' social and economic environments, higher education, social progress, and the rise of effective contraception (15). With age fertility declines, woman fertility is at its peak between the ages of 18 to 24 years , though, it begins to decline after age 27 and drops at a slightly greater rate after age 35 (16). In terms of ovarian reserve, a typical female has 12% of her reserve at age 30, and has only 3% at 40 years of age ; 81% of variation in ovarian reserve is due
to age only (17), making age the most vital factor in female infertility (18).

Even though the decision of a delayed marriage ,pregnancy influences the lifestyle of females, it leads to several health problems, older mothers have a higher possibility of both obstetric and fetal complications as gestational diabetes, placental abruption , placenta previa, , hypertensive disorders of gestation, and fetal congenital anomalies (19).

Weight and Life style

Body weight of females is potent determining factor of infertility risk by means of ovulation problems (20).Ovarian dysfunction might be caused by weight loss or excessive weight gain with body mass index (BMI) greater than 27 kg/m2 (21). Additional weight has also been found to have effect on treatment efficacy and results of assisted reproductive technique (22).
As estrogen is made by the fat cells and primary sex organs (23) therefore, state of high body fat or fatness causes increase in estrogen manufacture which the body interprets as birth control or limiting the chances of success pregnancy, similarly, too little body fat causes inadequate estrogen production and consequently menstrual irregularities with anovulatory cycle (24). Proper diet in early life had been linked to be a main factor for later fertility(25).

While, an individual life style ,fertility may be influenced by life style choice(26). Tobacco smoking and alcohol consumption contribute to infertility, smoking interferes with folliculogenesis as nicotine and other chemicals in cigarettes interfere with estrogen creation, also effect on embryo transport endometrial receptivity and angiogenesis, uterine blood flow and myometrium (27), and increases the risk of an in vitro fertilizations pregnancy miscarrying (28).
On the other hand, Alcohol consumption is associated with high estrogen level and this elevated level of estrogenreduces FSH secretions which then suppresses folliculogenesis and results in anovulation as a consequence (29).

Anatomical and medical causes

The main anatomical causes of female infertility include endometriosis,post-infectious tubal damage and congenital or acquired uterine anomalies, diseases of the uterus may lead to unproductiveness, pregnancy loss and other obstetric complications (30). Ovulatory dysfunction,

patients with amenorrhea, irregular menses or galactorrhea ,polycystic ovary syndrome (PCOS) , decrease of FSH level combined with decline of estradiol level suggests as a causes of female factor infertility ovulation disorders by 40 present as average as acause of infertility (31).

Aging diminished ovarian reserve endocrine disorder as hypothalamic amenorrhea, thyroid disease, hyperprolactinemia and adrenal disease or polycystic ovary syndrome, premature ovarian failure and tobacco use tubal factors by 30 percent; while obstruction as a pelvic inflammatory disease or tubal surgery and endometriosis about 15 percent; Other 10 percent as uterine or cervical factors and more than 3 percent as congenital uterine anomaly, fibroids polyps, poor cervical mucus quantity or quality that caused by smoking and/or infection (31).

Patients and Methods:

The current study was carried out in two of infertility centers ,the High Institute of Infertility Diagnosis and Assisted Reproductive Technologies \ AL- Nahrain University and Um Al-Baneen of infertility center at Baghdad-Iraq, as these centers entice the most of infertile capsules in al Karkh side of Baghdad.

The study involved of 1724 infertile female joined in assisted reproductive technology programs to enter ICSI cycle at high Institute of Infertility Diagnosis and Assisted Reproductive Technology and Um Al-Baneen of infertility center throughout the period from (February 2015) to (December 2020). The ratio of primary to secondary infertility will be assessed and the age of female divided to sub groups (each 5 years together) ,it was ranged from (12-50) in these 6 years.

The Statistical Analysis System- SAS (2012) program was used to detect the effect of difference groups in study percentage. Chi-square test was used to significant compare between percentage (0.05 and 0.01 probability in this study.

Results:

The total number of individuals (1724 females) was involved in this study during the years from the 2015 to 2020.   We take primary and secondary infertility cases in female and there was significant value (P≤0.05) in 2015 when study the relationship between age and incidence of normal and secondary infertility cases but it was non-significant   value(p>0.05) in primary infertility group in all age groups, that described the positive relationship with incidence of secondary infertility in female with age as observed in the table (1).

Table 1: Relationship between Age groups with incidence of primary and secondary infertility female in 2015.

Age group (year)	Normal	Primary infertility	Secondary infertility
15-25	9%	9%	5%
25-35	4%	9%	12%
35-45	3%	7%	14%
45-55	1%	4%	17%
Chi-Square (χ^2)	4.39 ∗	2.44 NS	5.19 ∗
∗ **(P≤0.05):** Significant, **NS: Non-Significant.**			

In 2016 there was significant value (P≤0.05) in secondary infertility group of female and Non-Significant result with the primary infertile group. the age has an inverse relationship with normality but a positive relationship with infertility (specially secondary infertility group) as observed in table (2).

Table 2: Relationship between Age groups with incidence of primary and secondary infertility Female in 2016.

Age group (year)	Normal	Primary infertility	Secondary infertility
15-25	18%	7%	4%
25-35	16%	8%	7%
35-45	13%	7%	14%
45-55	10%	5%	16%
Chi-Square (χ^2)	4.26 *	0.977 NS	4.96 *
* (P≤0.05): Significant, NS: Non-Significant			

While in 2017 year there are was a significant value(P≤0.05) in all age group of Secondary infertility in female but, there are was non-significant value(p>0.05) in all age groups in tow study groups (normal and Primary infertility groups) as observed in the table (3).

Table3: Relationship between Age groups with incidence of primary and secondary infertility Female in 2017

Age group (year)	Normal	Primary infertility	Secondary infertility
15-25	8%	13%	5%
25-35	7%	12%	6%
35-45	5%	9%	10%

45-55	2%	7%	15%
Chi-Square (χ^2)	2.61 NS	2.05 NS	4.33 *
* (P≤0.05): Significant, NS: Non-Significant.			

As shown as in 2018 year there are was a significant value(P≤0.05) in all age groups of the study (normal, Primary infertility ,Secondary infertility groups) and the result is observed in table (4).

Table (4): Relationship between Age groups with incidence of primary and secondary infertility Female in 2018

Age group (year)	Normal	Primary infertility	Secondary infertility
15-25	13%	15%	4%
25-35	5%	9%	9%
35-45	3%	8%	15%
45-55	1%	4%	17%
Chi-Square (χ^2)	5.29 *	4.76 *	5.27 *
* (P≤0.05): Significant.			

While, there was significant value (P≤0.05) in normal group of female in the study and non-significant   value(p>0.05) was shown in primary and secondary infertility groups, when the relationship between age groups with incidence of female was studied in 2019 year as observed in table (5) below.

Table (5): Relationship between Age groups with incidence of primary and secondary infertility Female in 2019

Age group (year)	Normal	Primary infertility	Secondary infertility
15-25	10%	10%	11%
25-35	4%	9%	12%
35-45	3%	7%	14%
45-55	1%	4%	17%
Chi-Square (χ^2)	4.61 *	2.39 NS	2.07 NS
* (P≤0.05): Significant, NS: Non-Significant.			

As same as 2019 year the study was shown same result in 2020 when study the relationship

between age groups with incidence of primary and secondary infertility in female , it was non-significant value (p>0.05) seen in both of primary and secondary infertility groups cyst group , while the result was significant value (P≤0.05) in normal group of female as observed in table (6).

Table (6) : Relationship between Age groups with incidence of primary and secondary infertility Female in 2020

Age group (year)	Normal	Primary infertility	Secondary infertility
15-25	9%	9%	10%
25-35	5%	8%	11%
35-45	3%	7%	14%
45-55	1%	4%	17%
Chi-Square (χ^2)	4.38 *	1.76 NS	2.48 NS
* (P≤0.05): Significant, NS: Non-Significant.			

Discussion:

The present study presented that the incidence of female infertility was elevated as a result for many reasons in the country since2015-2020. As one of the most serious social problems facing Iraqi society is infertility particularly in female groups. As they suffered from many environmental stress like war impact, pollution, social stress and many other reasons for decades. As many studies have been focused on the prevalence of infertility in the world, as a result of infertility increased and the life style is changing, it seems necessary to investigate the causes of infertility widely in Baghdad and studied the prevalence in this area .

The impact of war and its parameters highly influenced the fertility of persons and as infertility has many causes such as hormonal imbalances, routine, stress, smoking, occupation, diet , and hereditary (32,33) .

Infertility of females increased as females are more sensitive to environmental variations because of the hormonal system in female is enriched than identical one of males, and the average of females weight less than male that's she affected in small dose of pollutants more than male (34).

The frequency of different sources of infertility is very important to Know in every region and can be effective in manager judgments. Due to the growing of infertility `treatment methods and the development of infertility treatment clinics in several cities of Iraq, people with infertility problems after a while referred to these centers. Therefore it seems that the infertile individuals admitted to these centers can be a target population to study the infertility in each region as the infertility rate increased in Iraq (35).

The reasons of primary infertility and secondary infertility were not always a females problem, but both couple contribute to infertility (36).

In primary infertility, the majority of women are able to resolve their infertility problems with access to several diagnostic methods and infertility treatments (37).

In this study secondary infertility of females average age was higher when compared to females who had primary infertility as found in result women with age (35-55) more sensitive to secondary infertility type than women with (15-30) age. Previously, the difference in age has been highlighted by many researches to some degree (38).

In reproduction, the age of couple is obviously an important factor as a females fertility is firmly dependent on age (39). The ability to reproduce usually nearby the 20 years of females age and it starts to decline from the age of 30, then decrease severely from the age of 40 (40). Several regression analysis presented that women's age, length of marriage, and socio- economic status are predictive variables that reduce the yield of fertility among females with secondary infertility(36).

In this investigation, the proportion of female infertility was significantly higher in secondary infertility than primary infertility in Baghdad Al-Karkh in the period between (2015-2020). Additionally, certain studies have demonstrated that rate of secondary infertility in female higher than primary one (36,41).
Finally, age is the best surrogate marker for reproduction , however health and fitness are best pointers of fertility ,The drop in fertility is accompanied by an increased risk of aneuploidy and spontaneous abortions (38,42).

Conclusion:
As observed in this study, primary infertility and secondary infertility in female were related to several demographic characteristics and medical factors. However, females age, environments had a significant influence to accentuate the severity of secondary infertility.

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