

EPIDEMIOLOGY OF FEMALE SECONDARY INFERTILITY IN A SAMPLE OF FIVE PRIMARY HEALTH CARE CENTERS IN BAGHDAD / AL-KARKH

^{1*}Maryam Abdullah Ahmed, ²Azhar Esmael Al- Akeedy and ³Rafeal Sabah Abed Al- Shammari

¹Head of Specialist Physicians at Al-Shaala Higher Institute of Health, Baghdad, Iraq.

²Director of the Division of Specialized Centers Baghdad Al-Karkh, Baghdad, Iraq.

³EPI Manager of Baghdad/Alkarkh DOH, Ministry of Health, Baghdad, Iraq.

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*Corresponding Author: Maryam Abdullah Ahmed

Head of Specialist Physicians at Al-Shaala Higher Institute of Health, Baghdad, Iraq.

ABSTRACT

Background: The WHO conducted a global epidemiological research to standardise infertile couple examination. Female secondary infertility was chosen to study its prevalence, characteristics, risk factors, and treatment. The aim of study to find out how many Baghdad/Al-karkh residents have secondary infertility. Characteristics of secondary infertile women. Possible secondary infertility causes. **Method:** At five primary health care centres (PHCC) in Baghdad/Al-Karkh city—Al-Bayaa, Hay-Al-adel, Hay-Al salam, Abed-Al-sahib, and Al-Abayachi—a cross-sectional study was conducted to achieve these goals. Using the researcher's questionnaire, 500 married women aged 15–49 were selected from these centres. The data was collected from January 1 to August 31, 2006. **Results:** Results indicated 14.8% female secondary infertility, with over half of them aged 30–39, most of them housewives with 6–12 years of schooling. They were associated with contraceptive usage, irregular menstrual cycle, pelvic infection, abortion, abdominal or pelvic surgery, and chronic medical illnesses including DM or renal disease. They may have one or more factors. Such issues were linked to psychological trauma. Many secondary infertile women have a normal final pregnancy, although others have postpartum complications after surgery. Their final child was breastfed. **Conclusion:** the study found that ovarian diseases, hormonal instability, pelvic infection, and unexplained infertility drive female secondary infertility, with few male reasons. Most infertile women underwent hormonal assay, ultrasound, and seminal fluid analysis for their husbands and took hormone therapy to conceive, which worked for 44 of the total 74 secondary infertile women. We detected recurrence of infertility in 2.8% of patients, possibly for the same reason.

KEYWORDS: Epidemiology, Female, Secondary Infertility.

INTRODUCTION

Subfertility is defined as the failure to conceive within one year of regular, unprotected sexual intercourse. Primary subfertility refers to couples with no previous conception, while secondary subfertility occurs in couples who conceived previously but are unable to conceive again. Voluntary infertility applies to individuals who avoid pregnancy through contraception. According to the WHO, infertility classification depends on prolactin levels and includes seven groups ranging from hypothalamic - pituitary failure to hyperprolactinemia with or without detectable tumors.^[1-3] Infertility is a global issue with a prevalence of about 15%, varying by region.^[4] Diagnosis typically follows one year of unprotected intercourse, or six months for women over 35. Causes include abnormalities in the male or female reproductive system, with single causes

identified in most cases, though combined factors contribute to infertility in 15% of couples.^[5] Female age significantly influences fertility, with rates declining after 35 years. Common medical causes include irregular ovulation, endometriosis, tubal damage, and spermatogenesis defects. Tubal infertility is prevalent in secondary infertility and regions with higher rates of sexually transmitted diseases. Unexplained infertility accounts for 28% of cases after diagnostic evaluation.^[1,6,7] Male factors, such as varicocele, contribute to infertility in 26%-30% of cases. Ovulatory dysfunction stems from hypothalamic, pituitary, or ovarian defects, including conditions like polycystic ovary syndrome. Tubal damage often results from infections or surgery, while endometriosis disrupts normal conception processes. Cervical mucus abnormalities, caused by hormonal or physical factors,

may also impair fertility. Investigations for infertility involve assessing ovulation, tubal patency, and semen analysis. Tailored, evidence-based investigations improve cost-effectiveness and outcomes.^[2,3,7] Treatment depends on underlying causes. Ovulation problems are addressed through ovulation induction if regular menstruation does not resume. Tubal disease treatment aims to restore anatomy but depends on damage severity and surgical expertise. Assisted conception techniques, including intrauterine insemination, in vitro fertilization (IVF), and intracytoplasmic sperm injection (ICSI), are widely utilized to aid conception.^[1,5] Family physicians play a crucial role in managing infertility, considering the family as an emotional unit. Their involvement spans various levels, addressing family dynamics to support the couple through the diagnostic and treatment process.^[4]

Aims of the study to determine the prevalence of secondary infertility in the selected population in Baghdad /Al-karkh city. The characteristics of secondary infertile women. The factors that may be associated with secondary infertility.

METHOD

Study Design and Setting: A cross-sectional study was conducted at five selected primary health care centers (PHCCs) in Baghdad/Al-Karkh: Bayaa, Al-Abayachi, Hay-Al-Sallam, Hay-Al-Adel, and Abdul Sahib.

Sampling: The study included 500 women, with 100 participants selected from each PHCC using a convenient sampling method. Women were considered secondary infertile if they had not conceived after one year of regular intercourse without contraception.

- **Inclusion Criteria:** Married women aged 15-49 years, including widows and divorced women.
- **Exclusion Criteria:** Unmarried women, postmenopausal women, and women who had undergone hysterectomy.

Study Period: Data collection occurred from January 5, 2006, to August 31, 2006. Visits to each PHCC were conducted three days a week, for 3-4 hours per day, starting at 9 am. Interviews lasted 15-25 minutes, with 10-15 women interviewed daily.

Data Collection Tools

- **Questionnaire:** A structured questionnaire was developed and reviewed by the supervisor. It comprised three sections:
 1. Demographic and social characteristics.
 2. Risk factors contributing to secondary infertility, including gynecological/obstetric history, contraceptive use, history of polycystic ovary syndrome or pelvic infections, surgical interventions, chronic diseases, and drug intake.
 3. Management details, including investigations, treatment, treatment duration, outcomes, and recurrence of secondary infertility.
- **Interview:** Data was collected through face-to-face interviews conducted by the researcher in an exit

interview approach to minimize bias and ensure data accuracy.

Statistical Analysis: Data were analyzed using SPSS version 11.0. Descriptive statistics such as frequencies and percentages were used, with significance tested by chi-square. A p-value <0.05 was considered statistically significant. Figures were generated using Microsoft Excel.

RESULTS

Table 1: Characteristics of Secondary Infertile Women.

- **Age:** Secondary infertility was significantly higher among women aged 30–40 years and above, with the least percentage found in younger women (<20 years). This indicates a strong age-related impact on fertility.
- **Education:** No significant difference was found regarding education level, though women with 7–12 years of education showed the highest percentage of secondary infertility.
- **Occupation:** A significant association was found between being a housewife and secondary infertility. Women with professional occupations had the least association.
- **Residency:** No significant differences were noted between urban and rural residency.

Table 2: Secondary Infertility Vs Menarche and Number of Pregnancies.

- **Menarche:** No significant association was found between the age of menarche and secondary infertility. However, women with menarche at 12–13 years constituted the largest group.
- **Number of Pregnancies:** Women with fewer than two pregnancies showed a higher percentage of secondary infertility, indicating parity as a significant factor.

Table 3: Husbands' Demographic Factors.

- **Age:** Secondary infertility was significantly higher among husbands aged 30–49 years.
- **Education and Occupation:** No significant association was found between husbands' education or occupation and secondary infertility.

Table 5: Secondary Infertility Vs Gynecological Problems.

- **Abortion:** Significant association with secondary infertility (P=0.001).
- **Pelvic Infection and PCO:** Both showed significant associations, highlighting their role as major contributors.
- **Ectopic Pregnancy:** Associated significantly with secondary infertility.

Table 9: Relation between Secondary Infertility and Contraceptive Usage.

- **Contraceptive Methods:** A significant association was observed with oral contraceptive pill (OCP) usage, but not with IUCD or injectable methods.
- **Duration:** No significant association was observed with the duration of contraceptive use.
- **Duration:** Women with shorter infertility duration (1–3 years) had better outcomes compared to those with longer durations, reflecting the importance of early intervention.

Table 11: Chronic Medical Diseases.

- **Diabetes Mellitus and Renal Diseases:** Both were significantly associated with secondary infertility.
- **Thyroid Disorders and Hypertension:** No significant associations were observed.

Table 12: History of Surgical Operations and Psychological Trauma.

- **Surgical Operations:** Significant association, especially with pelvic surgeries, emphasizing their impact on secondary infertility.
- **Psychological Trauma:** A significant relationship was observed, suggesting a psychosomatic component in infertility.

Table 13: Duration of Secondary Infertility and Prognosis.**Table 1: Characteristics of Secondary Infertile Women.**

Characteristic	Category	Total (%)	Non-Infertile (%)	Secondary Infertile (%)	P-Value
Age in Years	<20	6.2	6.8	2.7	0.001
	20–24	20.4	22.8	6.8	
	25–29	19.6	20.7	13.5	
	30–34	23.8	21.4	37.8	
	35–39	15.6	15.0	18.9	
	≥40	14.4	13.7	20.3	
Years of Education	Illiterate	15.2	16.0	10.8	0.36
	1–6 Years	28.0	28.2	27.1	
	7–12 Years	38.4	38.5	37.8	
	>12 Years	18.4	17.4	24.3	
Residency	Urban	77.6	76.8	82.4	0.28
	Rural	22.4	23.2	17.6	
Occupation	Housewife	76.2	76.6	72.9	0.0
	Employer	17.0	17.1	16.2	
	Student	3.4	3.9	0.0	
	Self-Employed	0.8	0.2	4.0	
	Professional	2.6	1.8	6.7	
Marriage Age	<20	39.0	39.8	32.7	0.39
	20–24	34.0	33.0	37.0	
	25–29	20.6	21.6	19.2	
	30–34	6.4	7.0	2.7	
	≥35	2.0	1.6	4.0	
	Total	100	100	100	

Table 2: Secondary Infertility Vs Menarche and Number of Pregnancies.

Characteristic	Category	Total (%)	Non-Infertile (%)	Secondary Infertile (%)	P-Value
Menarche Age	<12	6.2	5.8	8.1	0.2
	12–13	64.6	66.1	55.4	
	14–15	26.6	25.1	35.15	
	>16	2.6	2.8	1.35	
Number of Pregnancies	<2	59.4	58.8	62.1	0.0
	3–5	33.8	34.7	29.7	
	>6	6.7	6.4	8.1	
	Total	100	100	100	

Table 3: Husbands' Demographic Factors Among Patients with and Without Secondary Infertility.

Characteristic	Category	Total (%)	Non-Infertile (%)	Secondary Infertile (%)	P-Value
Husband's Age	20–29	20.6	22.5	9.5	0.005
	30–39	45.6	46.5	17.6	
	40–49	25.4	23.0	39.2	
	≥50	8.4	7.3	25.7	
Husband's Education	Illiterate	7.4	7.2	8.1	0.547
	1–6 Years	22.8	23.9	16.2	
	7–12 Years	45.8	46.0	44.5	
	>12 Years	24.0	22.7	31.0	
Husband's Occupation	Student	1.4	1.1	2.7	0.35
	Employer	23.8	23.7	24.3	
	Self-Employed	68.8	73.7	62.1	
	Specialist	2.8	2.3	5.4	
	In Army	3.2	2.8	5.4	
Total		100	100	100	

Table 4: Female Secondary Infertility Vs Gynecological Problems.

Gynecological Problem	Secondary Infertile Women (No, %)	Non-Infertile Women (No, %)	Total (No, %)	P-Value
Abortion	23 (31.1%)	89 (20.8%)	112 (22.4%)	0.001
Pelvic Infection	12 (16.2%)	42 (9.8%)	54 (10.8%)	0.037
PCO	6 (8.1%)	17 (3.9%)	23 (4.6%)	0.04
Ectopic Pregnancy	3 (4.1%)	4 (0.4%)	7 (1.4%)	0.016
Fibroid	1 (1.4%)	2 (0.4%)	3 (0.6%)	
Tubal Damage	1 (1.4%)	1 (0.2%)	2 (0.4%)	
Compound	1 (1.4%)	1 (0.2%)	2 (0.4%)	
No Gynecological Problem	27 (36.5%)	260 (61.0%)	287 (57.4%)	
Total	74 (100%)	426 (100%)	500 (100%)	

Table 5: Relation Between Female Secondary Infertility and Contraceptive Usage.

Contraceptive Type/Duration	Secondary Infertile Women (No, %)	Non-Infertile Women (No, %)	Total (No, %)	P-Value
IUCD User	8 (14.8%)	71 (23.5%)	79 (22.1%)	0.335
Non-IUCD User	46 (85.2%)	231 (76.5%)	277 (77.9%)	
OCP User	9 (16.4%)	23 (9.1%)	32 (10.3%)	0.028
Non-OCP User	46 (83.6%)	231 (90.9%)	277 (89.7%)	
Injectable User	4 (8.0%)	33 (12.5%)	37 (11.7%)	0.478
Non-Injectable User	46 (92.0%)	231 (87.5%)	277 (88.3%)	
<2 Years Use	3 (10.7%)	35 (18.0%)	38 (17.1%)	0.503
2–4 Years Use	18 (64.3%)	104 (53.6%)	122 (54.9%)	
>5 Years Use	7 (25.0%)	55 (28.4%)	62 (27.9%)	
Total	74 (100%)	426 (100%)	500 (100%)	

Table 6: Relation between Female Secondary Infertility and Chronic Medical Diseases.

Medical Condition	Secondary Infertile Women (No, %)	Non-Infertile Women (No, %)	Total (No, %)	P-Value
Diabetes Mellitus	3 (4.5%)	4 (1.1%)	7 (1.5%)	0.035
Renal Disease	2 (3.1%)	1 (0.2%)	3 (0.6%)	0.011
Hypo/Hyperthyroidism	2 (3.1%)	10 (2.5%)	12 (2.6%)	0.854
Hypertension	1 (1.5%)	22 (5.4%)	23 (4.9%)	0.148
Total	74 (100%)	426 (100%)	500 (100%)	

Table 7: Female Secondary Infertility Vs History of Surgical Operation and Psychological Trauma.

Factor	Secondary Infertile Women (No, %)	Non-Infertile Women (No, %)	Total (No, %)	P-Value
Pelvic Operation	21 (28.3%)	74 (17.3%)	95 (19.0%)	0.0001
Abdominal Operation	4 (5.4%)	4 (0.9%)	8 (1.6%)	

No Surgical Operation	49 (66.3%)	348 (81.8%)	397 (79.4%)	0.0001
Psychological Trauma	8 (10.8%)	7 (1.6%)	15 (3.0%)	
No Psychological Trauma	66 (89.2%)	419 (98.4%)	485 (97.0%)	
Total	74 (100%)	426 (100%)	500 (100%)	

Table 8: Duration of Secondary Infertility Vs Prognosis.

Duration of Infertility (Years)	Get Pregnant (No, %)	No Pregnancy (No, %)	Total (No, %)	P-Value
1-3	36 (84%)	17 (54.8%)	53 (71.6%)	0.458
4-6	6 (14%)	10 (32.2%)	16 (21.6%)	
>7	1 (2%)	4 (13%)	5 (6.8%)	
Total	43 (100%)	31 (100%)	74 (100%)	

Table 9: Causes of Female Secondary Infertility According to Investigation Results.

Cause	Number (No, %)	Total (%)
Hormonal Disturbance	17	22.9%
Ovarian Failure	12	16.3%
Pelvic Infection	11	14.8%
Abortion	9	12.2%
Surgical Operation	8	10.8%
Male Causes	4	5.5%
Unexplained Infertility	7	9.5%
Use of Contraception	6	8%
Total	74	100%

Table 10: Secondary Infertility Vs Factors Related to the Last Pregnancy.

Factor	Secondary Infertile Women (No, %)	Non-Infertile Women (No, %)	Total (No, %)	P-Value
Fetal Maturity: Full Term	63 (85.1%)	250 (73.5%)	313 (75.6%)	0.002
Fetal Maturity: Preterm	11 (14.9%)	90 (26.5%)	101 (24.4%)	
End of Pregnancy: Normal Delivery	35 (47.2%)	228 (67.0%)	263 (63.5%)	0.000
End of Pregnancy: Complicated Delivery	15 (20.2%)	18 (5.2%)	33 (7.9%)	
End of Pregnancy: Safe Cesarean Section	17 (22.9%)	80 (23.5%)	97 (23.4%)	0.000
End of Pregnancy: Complicated Cesarean Section	7 (9.4%)	14 (4.1%)	21 (5.0%)	
Breastfeeding: Yes	53 (71.6%)	280 (82.3%)	333 (80.4%)	0.000
Breastfeeding: No	21 (28.4%)	60 (17.7%)	81 (19.6%)	
Total	74 (100%)	426 (100%)	500 (100%)	

DISCUSSION

This study investigated the prevalence and characteristics of secondary infertility among women attending five selected PHCCs in Baghdad, Al-Karkh. The prevalence of secondary infertility was 14.8%, lower than primary infertility (17.8%) and other study by and Yelda (1997), which reported higher rates of 32%, 26%, and 42%, respectively^[8] Improved general health and better management of pelvic infections may account for this decline.^[9] The study found that secondary infertility increased with age, peaking in women aged 30-39 years and above. This aligns with evidence that fertility declines after age 24, with rapid reductions after 30 due

to declining egg quality and endometrial receptivity.^[10,11] Educated women showed higher secondary infertility rates, although not significantly different from illiterate women. Education might enhance awareness and prompt care-seeking behavior.^[12] Most affected women were housewives, consistent with other studies, possibly reflecting the role of environmental pollutants and lifestyle factors.^[12,13] Residency showed no significant difference between rural and urban populations, likely due to similar socioeconomic statuses among participants. The study revealed a significant association between marriage duration (>11 years) and secondary infertility, coinciding with findings by Yelda (1997).^[8]

Fewer pregnancies and children correlated with higher secondary infertility rates, emphasizing the role of reproductive history.^[1,14] Early marriage was associated with higher infertility, potentially linked to increased risks of sexually transmitted diseases and pelvic inflammatory disease.^[15] Previous abortions, pelvic infections, polycystic ovary syndrome (PCOS), ectopic pregnancies, and menstrual disturbances were significantly associated with secondary infertility. Abortions and infections often result in tubal damage, leading to infertility.^[15,16] PCOS is a leading cause of anovulatory infertility, while ectopic pregnancies increase risks of tubal dysfunction.^[1,17] Hormonal disturbances, such as hyperprolactinemia, also contribute to infertility through ovulatory failure.^[1,2] There was a significant association between oral contraceptive use and secondary infertility. However, intrauterine contraceptive devices (IUCDs) showed no significant association, consistent with Bahamondes (1994).^[15] Long-term contraceptive use increased infertility risks, aligning with other studies.^[7] Diabetes mellitus and renal diseases were significantly associated with secondary infertility, while hypothyroidism and hypertension were not.^[1,18] Chronic conditions can disrupt hormonal balance and reproductive function. Prior pelvic surgeries were significantly linked to infertility due to adhesion formation and tubal dysfunction.^[2] Psychological trauma also showed a strong association, as stress-related factors can disrupt fertility through hormonal imbalances.^[19,20] Infertility duration inversely correlated with conception likelihood. Prolonged infertility adversely affects conception rates, emphasizing the need for timely interventions.^[1] The study identified hormonal disturbances, ovarian failure, and pelvic infections as primary causes of secondary infertility. These findings are consistent with studies by Yelda (1997) but lower than Al-Yaquabi (1978).^[8,21] International studies also highlight regional variations, with infections and endometriosis prevalent in Africa and Iran, respectively.^[6,14] Family physicians play a vital role in addressing infertility by providing emotional support, identifying causes, and facilitating treatment. They operate at various levels of involvement, from individual consultations to family counseling. Physicians' familiarity with patients' histories enables effective, cost-efficient evaluations and management, addressing both medical and emotional aspects of infertility.^[4,22,23]

CONCLUSION

The infertile women aged between 30-39 years, house wife, married at early age, for long duration, and low parity, with irregular cycle and hormonal disturbance. Female with history of abortion, pelvic infection, surgery, contraceptive usage, and psychological trauma are the main risk factors.

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