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Patterns of infertility among couples attending IVF center in maternity teaching hospital in Erbil

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Abstract

Background and objective: An understanding of certain socio demographic, clinical characters and causes of infertility among couples is important for improving management of this problem. This study aimed to assess the clinico-epidemiological pattern of infertile couples and to find out the association of infertility with various socio-demographic characteristics of infertile couples.

Methods: This is a case record review study carried out from March 2013 through April 2014. It comprised a retrospective review of a convenience sample of 1158 medical records of infertile couples attending the infertility center in Maternity hospital in Erbil city. Data collected; based on secondary data that was obtained from infertile couples medical records from the center. The medical records included socio-demographic characteristics of couples, data about the gynecological, surgical and medical history of wives and medical and surgical history of husbands. In-depth analyses of the data obtained from files were done by using SPSS version 19.

Results: Of the 1158 infertile couples, 727 (63%) had primary, and 431 (37%) had secondary infertility. The age range of wives was 15-48 years with mean ± SD of 31.25 ± 7.0 years and age range of husbands was 17-71 years with mean ± SD of 35.28 ± 8.0 years. The duration of infertility ranged between 1-27 years with mean ± SD of 6.2 ± 4.8 years. The proportion of primary infertility was significantly higher (91.5%) among women less than 20 years of age, while secondary infertility was higher (48%) among those aged 40 years and more. Female causes accounted for 32%, male causes account for 26%, combined cause 18% and 24% of them had unknown causes for infertility. Abnormal seminal fluid analysis parameter was significantly observed among primary infertile husband. Among wives, the infertility factors were the menstrual disorder, miscarriage and hormonal disorder.

Conclusion: Primary infertility was more prevalent among the study sample. Infertility was significantly associated with age, occupation and history of previous marriage among wives.

Keywords: Infertility, IVF center, Seminal fluid, Erbil.

Introduction

Infertility is a common problem and unique medical condition with important psychologic, economic, demographic, and medical implications. It involves a couple, rather than a single individual. Infertility is defined as failure of a couple to conceive after 12 months of regular intercourse without use of contraception in women less than 35 years of age, and after six months of regular intercourse without use of contraception in women 35 years and older.[1] Inability to have children is a personal tragedy for millions of couples worldwide. The situation of personal, interpersonal, social, and religious expectations brings a sense of failure, loss, and exclusion to those who are infertile. The problem of infertility has been increased in the last 30 years worldwide,

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regarding social phenomena, such as late marriage and child bearing, increasing use of contraception and making miscarriage more liberal in many developed countries. The incidence of infertility among the population has marked demographic and health implications. It was estimated that infertility affects at least 14% of people in reproductive age.[2] The prevalence and pattern of infertility vary between regions in developed and developing countries.[3] World Health Organization was estimated the range of infertility from 0.4% to 66.6%, depending on the type of population, source of infertility.[4] The incidence was high 30% in Sub Saharan Africa, five about 12% in some European communities and it was nearly 7.4% in the United States.[6] In a World Health Organization (WHO) study of 8500 infertile couples, female factor infertility was reported in 37% of infertile couples in developed countries, male factor infertility in 8 %, and both male and female factor infertility in 35%. The remaining couples had unexplained infertility or became pregnant during the study.[7] It is clear that fertility declines with advancing age, especially after the mid-30s, and women who conceive are at greater risk of pregnancy complications.[8] There is no comprehensive study and no reliable published data about the epidemiology of couple infertility in the region. The main objective of this study was to study the pattern of infertility among couples and to find out the association of infertility with certain socio-demographic characteristics of study sample in the maternity hospital in Erbil city.

Methods

Design of the study:
Case review study from registered files of infertile couples attended infertility center.

Setting and time:
This hospital based study was carried out at infertility center in the maternity hospital in Erbil city. This first private-governmental center in Erbil of its specialization in terms of infertility treatment and in vitro fertilization was established on 2010. The study period started from March 2013 to April 2014, including data collection, analysis, writing and finalizing the research.

Study population:
The study targeted all infertile couples who had problems with fertility and visited the center, since 2010-2014. A total of 1158 files were reviewed.

Inclusion criteria:
Infertile couples who visited the center since the establishment of the center.

Exclusion criteria:
Married couples of less than 12 months duration of marriage whose age was less than 35 years and married couples of less than six months duration of marriage whose age was more than 35 years. Files or medical records with incomplete information were also excluded.

Data collection:
Data collection based on secondary data that was obtained from infertile couples medical records from infertility center. The medical records include three parts; the first part contained socio-demographic characteristics of couples such as age, occupation, smoking, alcohol consumption, certain gynecological history. The second part contained data about the previous marriage, infertility duration, type of infertility, menstrual cycle, and the number of children and miscarriage, past medical and surgical history. The last part contained the results of hormonal and semen analysis. Each couple was given a unique code number on the data entry and counted only once. In-depth analyses of the data obtained from files were done. Regarding Seminal Fluid Analysis (SFA), the WHO criteria lower reference limits were used by the center. The following parameters represent the generally accepted 5th percentile (lower reference limits and 95% confidence intervals in parentheses); derived from a study of over 1900 men whose partners had a time-to-pregnancy of ≤12 months.[9]

- Volume — 1.5 mL (95% CI 1.4-1.7).

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- Sperm concentration — 15 million spermatozoa/mL (95% CI 12-16).
- Total sperm number — 39 million spermatozoa per ejaculate (95% CI 33-46).
- Morphology — 40 percent normal forms (95% CI 30-40).
- Vitality — 58 percent live (95% CI 55-63).
- Progressive motility — 32 percent (95% CI 31-34).
- Total (progressive + non-progressive motility) — 40 percent (95% CI 38-42).

Azoospermia is not having any measurable level of sperm in semen. Normal regular menstruation lasts for a few days, usually 3 to 5 days, but anywhere from 2 to 7 days is considered normal.[10] The average menstrual cycle is 28 days long from the first day of one menstrual period to the first day of the next. A normal menstrual cycle in adult women is between 21 and 35 days. Irregular menstrual cycle includes menorrhagia, menstrual cycle with either heavy blood loss (>80ml) or prolonged duration (>7 days); hypomenorrhea, non-pathological pattern of light or short menstrual cycle; polymenorrhea, frequent menstrual cycle (<21day); and oligomenorrhea, infrequent menstrual cycle (>6weeks).[11]

Equipments:

Hormonal assays measured by the center using Elecsys 2010 Immunoassay System and using Electro-Chemilumine Science detection.

Statistical analysis:

Data were entered and analyzed by using computer software; the statistical package for the social sciences (version 19). Both descriptive and analytic approach were used; descriptive to determine frequencies and mean standard deviation of the age of couples; while analytic approaches were used to measure the significant difference among the variables. Chi-square test was used to assess the association between categorical variables and t- test was used to compare between two means. The results were presented in appropriate tables and graphs. P value ≤0.05 was regarded as statistically significant.

Ethical consideration: The study was approved by Scientific Committee of the College of Medicine; Hawler Medical University. A facilitation letter was obtained from Erbil Directorate of Health and Erbil Infertility Centre.

Results

A total of 1158 infertile couples were included in the study. The age range of wives was 15-48 years with mean ± SD of 31.25 ± 7.0 years and age range of husbands was 17-71 years with mean ± SD of 35.28 ± 8.0 years. The range of duration of infertility was 1-27 years with mean ± SD of 6.2 ± 4.8 years. The higher proportion of wives were in their second and third decades of life (38.1% and 42.6% in respectively), while about 70% of husbands were in their third and fourth decades of life. About 74% of wives were un-employed (housewives) and only 1.1% of them were smokers, while more than half percentages (54%) of husbands were un-employed and 34.5% were smokers. Details of socio-demographic characteristics are shown in Table 1. Regarding certain gynecological history, 65% of the 1157 wives had regular menstrual cycle, and 32% of the 431 gravida wives had gravid of 1-3; while 23.5% of the 299 wives with history of miscarriage had 1-3 miscarriages (Table 2).

http://dx.doi.org/10.15218/zjms.2016.0046

Table 1: Socio-demographic characteristics of study sample.

Variables	Wives		Husbands		Total couples (N=1158)	
	No	%	No	%	No	%
Age group in years						
<20	44	3.9	3.0	0.30	47	2.02
20-24	171	14.7	71	6.10	242	10.5
25-29	271	23.4	215	18.6	486	21.0
30-34	278	24.0	305	26.3	583	25.2
35-39	215	18.6	236	20.4	451	19.5
40-44	150	13.0	183	15.8	333	14.4
45-49	29	2.50	90	7.80	119	5.13
≥50	0	0.00	55	4.70	55	2.40
Occupation						
Employed	302	26.1	536	46.3	838	36.2
Non-employed	856	73.9	622	53.7	1478	63.8
Smoking						
Yes	13	1.1	410	35.4	423	18.25
No	1145	98.9	720	62.2	1865	30.55
X-Smoker	0	0.0	28	2.4	28	1.20
Alcohol Consumption						
Yes	0	0.0	5.0	0.44	5.0	0.20
No	1158	100	1153	99.56	2311	99.8
Total	1158	100	1158	100	2316	

Table 2: Certain gynecological characteristics of study sample.

Female variables	No.	%
Menstrual cycle (N: 1158)		
Regular	780	67.4
Irregular	378	32.6
Gravida (N=431)		
1-3	371	32
4-6	52	4.5
≥7	8	0.7
Para (N=234)		
1-3	224	19.3
4-6	10	0.90
Miscarriage (N=299)		
1-3	272	23.5
4-6	24	2.10
7-9	3	0.25

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This study found that out of 1158 infertile couples 727 (63%) had primary and 431 (37%) had secondary infertility. Regarding underline cause of infertility among studied sample; female causes accounts for 32%, while male causes accounts for 26% (Figure 1). There was a statistically significant association between the age and the type of infertility, *P* <0.001. The proportion of primary infertility was higher (91.5%) among women aged less than 20 years than that of other age groups, while secondary infertility was higher (48%) among age group 40 year and more. The mean ± SD of the age of wives was significantly more among secondary infertility than that of primary infertility; 33.0 ± 6.6 versus 30.2 ± 7.1, *P* <0.001. Among the wives, the proportion of primary infertility was higher (65.9%) among unemployed in comparison to secondary infertility (34.1%), while secondary infertility was more prevalent among employed 46% than among unemployed (43.1%), *P* <0.001. There was a statistically significant association between infertility type and history of previous marriage, in which the secondary infertility was high (65.5%) among those who had no such history, *P* <0.001 (Table 3).

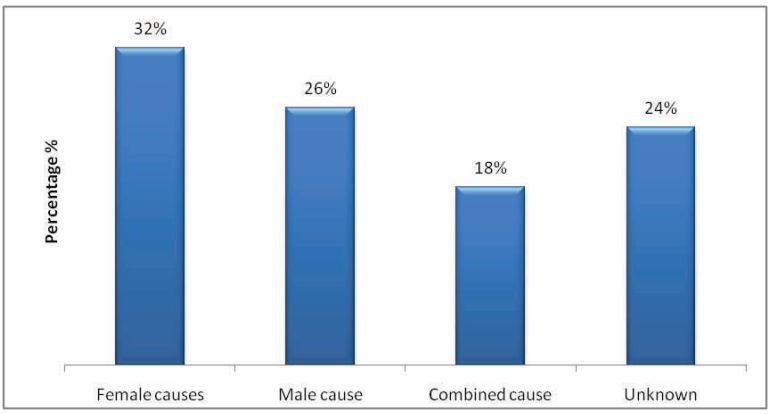

Figure 1: Distribution of sample by causes of infertility.

Table 3: Association between certain variables in wives with type of infertility.

Variables	Type of infertility				Total (N=1158)	*P* value
	Primary (n=727)		Secondary (n=431)			
	No	%	No	%		
Age group in years						
<20	65	91.5	6	8.50	71	<0.001
20-24	107	74.3	37	25.7	144	
25-29	173	63.8	98	36.2	271	
30-34	175	62.9	103	37.1	278	
35-39	114	53.0	101	47.0	215	
≥40	93	52.0	86	48.0	179	
Smoking						
Yes	9	69.2	4	30.8	13	0.629
No	718	62.7	427	37.3	1145	
Occupation						
Employed	163	54.0	139	46.0	302	<0.001
Unemployed	564	65.9	292	34.1	856	
Menstrual cycle						
Regular	476	61.0	304	39.0	780	0.076
Irregular	251	66.4	127	33.6	378	
Previous marriage						
Yes	19	34.5	36	65.5	55	<0.001
No	708	63.2	395	35.8	1103	

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This study revealed that age of husbands significantly associated with the type of infertility. Husbands aged less than 20 years had primary infertility while those in their fifth decade of life; 60% of them had primary and 40 % had secondary infertility, *P* <0.001. Occupation and smoking habits among husbands showed a statistically nonsignificant association with the type of infertility (Table 4). Seminal fluid analysis (SFA) was found to have an association with type and incidence of infertility, in which, those who had Azoospermia found to have 22.8% primary infertility and 4.6% had secondary infertility as shown in Table 5.

Table 4: Association between certain variables in husbands and type of infertility.

Variables	Type of infertility					
	Primary (n=727)		Secondary (n=431)		Total (N=1158)	*P* value
	No	%	No	%		
Age group in years						
<20	10	100	0	0.00	10	<0.001
20-24	53	82.8	11	17.2	64	
25-29	159	74.0	56	26.0	215	
30-34	197	64.6	108	35.4	305	
35-39	135	57.2	101	42.8	236	
40-44	88	48.1	95	51.9	183	
45-49	52	57.8	38	42.2	90	
≥50	33	60.0	22	40.0	55	
Occupation						
Employed	334	62.3	202	37.7	536	0.76
Unemployed	393	63.2	229	36.8	622	
Smoking						
Yes	257	62.7	153	37.3	410	0.81
No	454	63.1	266	39.9	720	
Ex-smoker	16	57.1	12	42.9	28	

Table 5: Association between seminal fluid analysis and the type of infertility in husbands.

SFA	Type of infertility				Total		*P* value
	Primary (n=727)		Secondary (n=431)		No.	%	
Normal	358	49.24	319	74.0	677	58.5	<0.001
Abnormal*	203	27.9	92	21.3	295	25.5	
Azoospermia	166	22.8	20	4.6	186	16.0	
Total	727	100	431	100	1158	100	

*oligo-terato-asthenozoospermia

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This study showed that out of 1158 wives; 376 (32.6%) had menstrual disorder, 176 (15.2%) had hormonal disorder, 299 (25.8%) had history of miscarriage, 37 (3.2%) had tubal disorder, 58 (5%) had uterine factors, 93 (8%) had ovarian cystectomy and 119 (10.2%) had other factors (unknown or male causes) as shown in Figure 2.

Discussion

Infertility is a major public health problem and still regarded as a complex disorder with significant medical, psychosocial, and economic aspects.[13] Most studies are unanimous in the conclusion that infertility is a more stressful experience for couples especially wives than it is for husbands. Wives experiencing infertility felt their marriage was threatened and feared abandonment by their husbands.[14] This is the first study done in Erbil to find out the pattern and socio-demographic aspect of infertility. In this study, primary infertility was higher (63%) than secondary infertility (37%). This finding is nearly consistent with other studies done in our region; like in Iran a study among 2500 infertile couples, 61.3% had primary and 38.7% had secondary infertility.[15] In Duhok among 250 infertile couples, 77.2% had primary and 22.8% had secondary infertility.[16] In Turkey, 73.1% of women had primary infertility and 26.9% had secondary infertility[17]. In most of the studies association between high age of wives and infertility is well approved.[18] The current study revealed the highest prevalence of primary infertility among those aged less than 20-35 years. On the other hand, the highest prevalence of the secondary infertility was among wives who close to the end of their reproductive life (those aged 35-49 years). This finding is similar to that reported in a study done in Egypt.[19] Data from this study suggest that infertility in wives seeking treatment peaks between ages 25 to 35 years, while; slightly decrease observed in the age group 35 to 40 years and more rapidly decrease seeking treatment after their fourth decades of life. This might be due to cultural, social and financial factors. While in the husband, seeking treatment peaks between age 25 and 40 years and slightly decrease between 40 and 50 years and then rapidly after 50 years. This also might be due to financial, social or they might be reached to a hopeless point for example chromosomal abnormalities, or they have chosen another option, such as marrying a new wife. This study revealed that primary infertility was significantly high among unemployed wives while secondary infertility was high among employed wives. This might be due to early marriage of young girls before the age of employment in our culture. However, Barzilai-Pesach

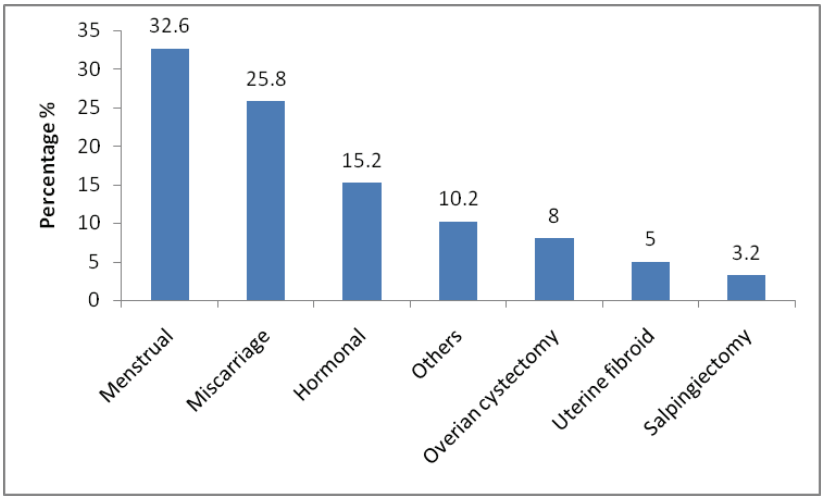

Figure 2: Proportions of disorders among infertile wives.

http://dx.doi.org/10.15218/zjms.2016.0046

et al. found that women who perceived their job as more demanding were less likely to conceive, and they also reported that actual workload, measured by full-time versus part-time job, was found among women who conceived to be significantly associated with less likelihood to successfully complete a pregnancy.[20] Secondary infertility was significantly high among those women who had a history of previous marriage; this might be due to new husband infertility factors. The most common cause of infertility in women in this study was ovulation disorder (menstrual disorder 32.6% and hormonal disorder 15%). This result is comparable with study done in Duhok which showed that the most common cause of female infertility was ovulation disorders (41%).[16] Smoking was more among primary infertile men, but this difference was not statistically significant. This is agreed with a study done by Bolumar et al.[21] This might go with the fact that cigarette smoking and its possible effect on sperm counts are inconsistent. However, in a meta-analysis of 20 observational studies, men who smoked cigarettes were more likely to have low sperm counts.[22] Regarding seminal fluid analysis, we found that there is a statistically significant association between seminal fluid variables and type of infertility, in which the rate of oligo-terato-asthenozoospermia was 295 (25.5%) and azoospermiawas186 (16%) among total cases. This finding is in agreement with a multicentre survey conducted in three regions in France, which studied the 1686 couples in these regions. The main causes of male infertility were oligo-terato-asthenozoospermia (21%), versus (9%) azoospermia.[23] Unavailability of some information that can affect the fertility in couples such as body-mass index, the exact nature of men occupation, exposure to harmful physical and chemical agents and educational level has led to having few number of variables in this study. Another limitation is related to data collection as medical records of the center were sorted by numbers and not according to dates, so the researcher had to review all the files in the archive of the center and this required a lot of efforts and time.

Conclusion

Primary infertility found to be more prevalent than secondary infertility. Among women, younger age and unemployment were the variables that found to be associated with primary infertility while previous marriage was associated with secondary infertility. Menstrual disturbances, miscarriage and hormonal abnormalities were the most addressed conditions of wives with infertility, while abnormalities of seminal fluid parameters were mostly revealed in husbands with primary infertility.

Conflicts of interest

The authors report no conflicts of interest.

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