

## Etiology of infertility in couples attending maternity hospital in Erbil

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### Abstract

**Background and objective:** Infertility remains a global health challenge with devastating psycho-social consequences in many communities and an underlying long-term risk for separation of the couple, also remains a major clinical and social problem. Infertility is defined as inability of a couple to conceive naturally after one year of intercourse. An understanding of the medical causes of infertility is crucial in order to reduce incidences of infertility and for improving the clinical management of infertility. The aim of the study was to determine the causes of infertility in couples.

**Methods:** A retrospective study was done in IVF Unit at Maternity Teaching Hospital in Erbil. Data of infertile couples were collected from already prepared patient's files.

**Results:** The frequency of primary and secondary infertility among women was 62.97% and 37.03%, respectively. Among 370 couples, 35.68% had female factor, 29.46% had both male and female factors, and 19.73% had male factor, while 15.14% of the couples had unexplained infertility.

**Conclusion:** Primary infertility was common health problem in couples, also the causes of infertility in women is noticed more than men.

**Keywords:** Infertility, Etiology, Hormones, Semen.

### Introduction

The subject of infertility has taken its place in the health sector at the top level. Since primary health care services are insufficient, most people, especially women, keep on suffering from it all over the world, namely in underdeveloped or developing countries<sup>1</sup>. It is defined as 1 year of unprotected intercourse, in which a pregnancy is not achieved<sup>2,3</sup>. Although good documentation of the prevalence of infertility is lacking, it is generally believed that more than 70 million couples suffer from infertility worldwide, the majority being residents of developing countries<sup>4</sup>. The prevalence varies widely, being less in developed countries and more in developing countries where limited resources for investigation and treatment are available<sup>5,6</sup>. Infertility

affects both men and women. If there is a single factor, the fertile partner may compensate for the less fertile partner. However, in many couples, a male and a female factor coincide. Infertility usually becomes manifest if both partners are sub-fertile or have reduced fertility<sup>7</sup>. Unexplained infertility is a diagnosis of exclusion given to an average of 14% of the couples who have undergone an evaluation for causes of infertility without the identification of a potential etiology<sup>8</sup>. A rule of third can be applied, one third of couple infertility cases can be attributed to male reproductive causes alone, one third can be attributed to female causes alone and one third can be attributed to male plus female causes<sup>3</sup>. Male factor infertility is a complex disorder that affects a large sector of the

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population; however, many of its etiologies are unknown<sup>9,10</sup>. Male factor infertility accounts for up to half of all cases of infertility and affects one man in 20 in the general population<sup>11</sup>, of which 10% is due to azoospermia<sup>12</sup>. The first test for men should be a semen analysis, if oligospermia or azoospermia is found, then blood tests for testosterone, luteinizing hormone (LH), follicle-stimulating hormone (FSH), and prolactin (PRL) are warranted<sup>2,13</sup>. The older women have less chance of conceiving naturally<sup>14,15</sup>. Age is associated with infertility, maternal age of  $\geq 35$  years, paternal age of  $\geq 40$  years have a higher risk of infertility<sup>16-18</sup>. Advancing age is associated with decreased semen volume and motility and increase in abnormal morphology but with no consistent effect on sperm concentration<sup>19</sup>. Sexually transmitted diseases are prominent risk factors for infertility in developing countries and may lead to infertility if untreated<sup>4,20,21</sup>. Evaluating female factors in infertility is more complex and should begin with the laboratory tests and screening for sexually transmitted diseases<sup>2,22</sup>.

## Methods

A retrospective study was applied on 370 infertile couples attended to IVF Unit at Maternity Teaching Hospital in Erbil for five months from April 2010 to August 2010, whereas, data were collected from already written patients files between October 2010 to December 2010. The data were prepared by gynecologist and nurses, which include socio-demographic and medical history for both men and women. However some unclear data were excluded from the study. IVF Unit gave their acceptance to share their data in this study. Infertility is classified into primary and secondary. Primary infertility describes couples who have never been able to conceive with unprotected intercourse. Secondary infertility is applied for women who have been pregnant at least once, but have not been able to become pregnant again. Hormones were measured with an electrochemiluminescence immunoassay (ECLIA) in laboratory

of IVF Unit at Maternity Teaching Hospital for women and men. For women, hormonal assays consisted of FSH, LH, PRL, estradiol (E2), progesterone (P4) and thyroid-stimulating hormone (TSH). For men serum LH, FSH, and testosterone. ECLIA also were used for detection of HIV, HCV and HBs Ag. The semen was analyzed onto asthenozoospermia (i.e. progressive motility of spermatozoa below 32%), oligozoospermia (i.e. spermatozoa concentration below  $15 \times 10^6$  per ml), teratozoospermia (i.e. morphologically normal spermatozoa below 4%), asthenoteratozoospermia, cryptozoospermia, haemospermia, leukospermia, necrozoospermia, oligoasthenozoospermia, oligoasthenoteratozoospermia, oligoteratozoospermia, and azoospermia, which defined as no spermatozoa in the ejaculate<sup>23</sup>. The data were evaluated by SPSS (Statistical Program for Social Sciences) version 18 for Windows with t test, mean  $\pm$  SD (standard deviation) and percentage (%) where possible.

## Results

Evaluated demographic characteristics of 370 infertility couples were enrolled in this study. The percentage of women age 36–40 years had been 21.89% and for 41–45 years had been 11.89%. The majority of both couple had primary infertility (62.97% women, 61.35% men), whereas 37.03% of women and 38.75% of men had secondary infertility. Women and men with previous marriage were 2.43% and 10.54%, respectively. Whereas 0.27% and 5.67% of women and men had children from previous marriage, respectively. Among all women, 244 (65.95%) had regular cycle and 126 (34.05%) had irregular cycle. The percentage of pregnancies, deliveries, and abortions were 37.57%, 21.89%, and 26.76%, respectively, Table 1. Mean age of women and men were  $32.02 \pm 6.948$  and  $35.97 \pm 7.894$  years, respectively. Ages were statistically older in secondary infertility group than primary infertility group, P value  $< 0.001$ , Table 2. About 3% and

1.03% of women had HCV and HBs Ag, respectively, whereas, men were free from sexually transmitted diseases Table 3. Infertility factors were divided into four categories, female factors were most frequent (35.68%), followed by combined factors (29.46%), male factors (19.73%), and unknown factors (15.14%), Table 4. Hormonal disorder (37.30%), irregular menstrual cycle (34.05%), recurrent abortion (26.76%), tubal factor (4.86%) and amenorrhea (0.54%) were causes of women infertility, Table 5. FSH, LH and PRL level were

significantly higher in primary infertility than secondary infertility. FSH and TSH value in irregular cycle were higher than regular cycle Table 6. Out of 370 semen analysis, most semen (51.08%) was normozoospermia followed by azoospermia (11.62%), asthenozoospermia (10.81%), asthenoteratozoospermia (7.03%) and leukospermia (4.86%) Table 7. Azoospermia was indicated for hormones analysis of which the level of FSH, LH, PRL and testosterone were  $18.43 \pm 17.589$ ,  $6.45 \pm 5.947$ ,  $39.86 \pm 61.087$  and  $3.15 \pm 1.758$ , respectively

**Table 1:** Demographic characteristics of 370 infertile couples

Characteristics		Women		Men	
		n	%	n	%
Social	Smoke	10	2.70	95	25.68
	Drink	0	0.00	2	0.54
	Smoke and drink	0	0.00	10	2.70
	Non-smoke and Drink	360	97.30	263	71.08
Age (years)	16–20	19	5.14	1	0.27
	21–25	60	16.22	29	7.84
	26–30	78	21.08	75	20.27
	31–35	83	22.43	80	21.62
	36–40	81	21.89	94	25.41
	41–45	44	11.89	59	15.95
	46–50	5	1.35	19	5.14
	51–55	0	0.00	4	1.08
	56–60	0	0.00	7	1.89
	> 61	0	0.00	2	0.54
Type of infertility	Primary infertility	233	62.97	227	61.35
	Secondary infertility	137	37.03	143	38.65
Previous marriage		9	2.43	39	10.54
Child from previous marriage		1	0.27	21	5.68
Cycle	Regular	244	65.95		
	Irregular	126	34.05		
	Gravida	139	37.57		
Gravidity	Nulligravid	231	62.43		
	Numbers of pregnancy (Mean±SD)	2.16±1.603			
	Para	81	21.89		
Parity	Nulliparas	289	78.11		
	Numbers of deliveries (Mean±SD)	1.13±0.341			
	Abortion	99	26.76		
Abortion	No abortion	271	73.24		
	Numbers of abortion (Mean±SD)	1.84±1.434			

**Table 2:** Compared age and marriage duration in primary and secondary infertility

Age and Marriage duration (years)		Primary infertility	Secondary infertility	Total
<b>Women age</b>	Mean± SD	30.87±6.797	33.97±6.789	32.02±6.948
	Minimum	16	19	16
	Maximum	46	47	47
<b>Men age</b>	Mean± SD	34.22±7.440	38.75±7.822	35.97±7.894
	Minimum	20	22	20
	Maximum	70	71	71
<b>Marriage duration (Mean ±SD)</b>		7.53±5.698	9.53±5.531	8.27±5.712

High significance between ages in primary and secondary infertility women (T= 4.24, P<0.001).

High significance between ages in primary and secondary infertility men (T= 5.58, P<0.001).

High significance between marriage duration in primary and secondary infertility (T= 3.30, P=0.001).

**Table 3:** Estimation of sexual transmitted disease among couples

Sexually transmitted disease	Women		Men	
	n	%	n	%
HIV	0	0.00	0	0
HCV	3	3.09	0	0
HBs Ag	1	1.03	0	0
HIV, HCV and HBs Ag negative	93	95.88	83	100
Total	97		83	

**Table 4:** Etiology of infertility among couples

Infertility factors	n	%
Female	132	35.68
Male	73	19.73
Combined	109	29.46
Unknown	56	15.14
Total	370	

**Table 5:** Infertility factors among 270 women

Infertility factors	<i>n</i>	%
Hormonal disorder	138	37.30
Irregular cycle	126	34.05
Recurrent Abortion	99	26.76
Tubal factor	18	4.86
Amenorrhea	2	0.54

**Table 6:** Compared women hormonal profile of primary and secondary infertility, and irregular and regular cycle

Infertility and cycle	FSH (MIU/ml)		LH (MIU/ml)		PRL (Ng/ml)		E2 (Pg/ml)		P4 (Ng/ml)		TSH (MIU/ml)	
	<i>n</i>	Mean±SD	<i>n</i>	Mean±SD	<i>n</i>	Mean±SD	<i>n</i>	Mean±SD	<i>n</i>	Mean±SD	<i>n</i>	Mean±SD
Primary infertility	166	8.73±13.223	157	4.92±5.455	156	23.44±15.337	97	58.48±107.775	85	1.66±4.132	117	2.23±1.260
Secondary infertility	95	7.80±7.868	85	3.77±3.931	86	18.58±12.787	57	43.95±27.971	52	2.01±6.230	66	2.29±3.338
Total	261	8.39±11.556	242	4.51±4.995	242	21.71±14.642	154	53.16±87.569	137	1.79±5.013	183	2.25±2.234
T-value	0.62		1.71		2.50		0.99		0.40		0.16	
P-value	0.534		0.088		0.013		0.32		0.689		0.872	
Irregular cycle	79	5.89±6.466	87	21.53±17.766	41	61.86±151.375	33	2.69±7.773	65	1.96±1.136	126	28.74±8.617
Regular cycle	163	3.85±3.952	155	21.81±12.618	113	70.29±220.917	104	1.51±3.752	118	2.41±2.643	244	33.27±7.524
Total	242	4.51±4.995	242	21.71±14.642	154	68.04±204.281	137	4.51±4.995	183	2.25±2.234	370	31.73±8.190
T-value	3.03		0.14		0.23		1.18		1.31		5.23	
P-value	0.003		0.886		0.822		0.241		0.193		<0.001	
Normal value	3.9–12		1.5–8		5–35		18–147		<0.25–0.54		0.25–5	

**Table 7:** Distribution semen quality

Semen quality	n	%
Normozoospermia	189	51.08
Azoospermia	43	11.62
Asthenozoospermia	40	10.81
Asthenoteratozoospermia	26	7.03
Leukospermia	18	4.86
Cryptozoospermia	14	3.78
Oligoasthenoteratozoospermia	11	2.97
Teratozoospermia	9	2.43
Oligoasthenozoospermia	8	2.16
Oligozoospermia	5	1.35
Oligoteratozoospermia	4	1.08
Haemospermia	3	0.81
Total	370	

**Table 8:** Mean± SD of hormones according to semen quality

Hormones (Normal value)	Semen quality	n	Mean±SD	Minimum	Maximum
<b>FSH</b> (1.7–12 MIU/ml)	Normozoospermia	3	5.32±3.816	1.47	9.10
	Oligozoospermia	3	14.53±8.550	8.40	24.30
	Teratozoospermia	1	4.40	4.40	4.40
	Azoospermia	23	18.43±17.589	2.10	56.80
	Asthenozoospermia	2	5.40±5.657	1.40	9.40
	Cryptozoospermia	5	5.42±3.053	1.14	9.16
	Oligoasthenoteratozoospermia	5	8.27±4.416	3.09	12.75
	Asthenoteratozoospermia	1	1.90	1.90	1.90
	Total	43	13.23±14.393	1.14	56.80
<b>LH</b> (1.1–7.0 MIU/ml)	Normozoospermia	3	3.05±1.895	1.36	5.10
	Oligozoospermia	3	4.87±2.730	3.00	8.00
	Teratozoospermia	1	4.00	4.00	4.00
	Azoospermia	20	6.45±5.947	0.99	23.30
	Asthenozoospermia	2	3.90±4.101	1.00	6.80
	Cryptozoospermia	5	2.93±1.826	0.52	4.91
	Oligoasthenoteratozoospermia	4	2.88±0.666	1.89	3.32
	Asthenoteratozoospermia	1	2.10	2.10	2.10
	Total	39	4.95±4.675	0.52	23.30
<b>PRL</b> (3–25 Ng/ml)	Normozoospermia	3	9.05±5.483	4.20	15.00
	Oligozoospermia	1	10.40	10.40	10.40
	Teratozoospermia	1	14.00	14.00	14.00
	Azoospermia	9	39.86±61.087	4.30	200.00
	Asthenozoospermia	2	13.55±2.899	11.50	15.60
	Cryptozoospermia	3	4.83±4.510	0.50	9.50
	Leukospermia	1	7.18	7.18	7.18
	Asthenoteratozoospermia	1	11.00	11.00	11.00
	Total	21	22.38±41.773	0.50	200.00
<b>Testosterone</b> (3–10.6 Ng/ml)	Normozoospermia	3	5.15±4.173	0.60	8.80
	Oligozoospermia	2	1.07±1.039	0.33	1.80
	Teratozoospermia	1	5.00	5.00	5.00
	Azoospermia	10	3.15±1.758	0.05	6.30
	Asthenozoospermia	2	7.60±7.920	2.00	13.20
	Cryptozoospermia	1	0.70	0.70	0.70
	Leukospermia	1	1.08	1.08	1.08
	Asthenoteratozoospermia	1	3.60	3.60	3.60
	Total	21	3.56±3.140	0.05	13.20

## Discussion

Infertility has remained a public health challenge and developed a psychiatric disorder with most of the burden in developing countries<sup>24, 25</sup>. Infertility is associated with social stigmatism and an underlying long-term risk for separation of the couple. The current study clarified that primary infertility was more common than secondary infertility which was similar to others studies. Among 250 infertile couples studied in Duhok, Iraq, 77.2% had primary infertility and 22.8% had secondary infertility<sup>26</sup>. In Turkey, 73.1% of women had primary infertility<sup>(27)</sup>. Primary infertility was more common (61.37%)<sup>28</sup>, approximately 81% of couples had primary infertility and 19% had secondary infertility in Iran<sup>29</sup>. It seem that the primary infertility was more common in Iraq, Iran and Turkey. Also, In Sudan, around 80% of infertile couples suffered from primary infertility<sup>30</sup>. However, primary infertility was found in 90.1% of couples at Royan institute, Iran<sup>31</sup>. The largest component for the primary evaluation of the infertile couple remains focused on the woman. In part, the woman typically pursues this issue on her own, with her gynecologist. If a couple does present for evaluation the female factor still dominates evaluation, as infertility has historically been considered principally a female problem<sup>7</sup>. The most common causes of infertility were female factor and this result is in accordance with those reported by other studies<sup>28, 30</sup>. While, in Royan institute the most common causes of infertility was male factor (50.5%)<sup>31</sup>. In Iraq, Duhok, male infertility was found in 36.8% couples<sup>26</sup>. In Turkey, the most common causes of infertility were male factor 32.8%, while female factor was 30.5%<sup>27</sup>. In Iran, Yazd, among 300 consecutive infertile couple, the major causes of infertility was 40% male factor while female factor was 44.3%<sup>29</sup>. The most common cause of women infertility was hormonal disorders (37.30%) and irregular menstrual cycle (34.05%), while, In Duhok most common cause of women infertility was ovulation

disorders (41%), however, tubal obstruction contributed to only 5% of women that result is in harmony with this study<sup>26</sup>. In our study, sperm disorder were azoospermia (11.62%), asthenozoospermia (10.81%), asthenoteratozoospermia (7.03%) and 2.43% had teratozoospermia. Sperm disturbance were most common etiologic factors responsible for male infertility. In Nigeria, 26% of males were normozoospermic and 70% had oligozoospermic, while 4% were azoospermic<sup>32</sup>.

## Conclusion

The present study shows that primary infertility was common condition among infertile couples. In women the causes of infertility were more than men. Sexually transmitted diseases were not causative as infertility etiological factors.

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