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The prevalence of primary and secondary infertility of Iraqi men and women in different governorates, during 2014-2018

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Abstract
Background: The subject of infertility has taken its place in the health sector at the top level. Since primary health services are insufficient, most people, especially women, keep on suffering from it all over the world, namely in underdeveloped or developing countries.
Objective: The purpose of this study was to find the prevalence of primary and secondary infertility among the attendants of Iraqi out patients clinics of infertility according to their gender.
Materials and Methods: A retrospective study was done in Iraq. Data of infertile patients were collected from prepared patients' files after using Anthropometrics measures, Hormonal, Ultra sound, assessments and Seminal fluid exam for men.
The annual data collection via the Iraqi Ministry of Health of different Iraqi Governorates during the years from 2014 -2018 were used.
Results: The prevalence of primary infertility among Women and Men during 2014 was78.2%,21.8%, respectively in 2015 was 98.1%,1.9%, in 2016:75.4%,24.6%.in 2017:in women 77.0%, in men 23.0% and in 2018, was 79,1% in women,20.9% in men. While the prevalence of secondary infertility during 2014: in women,62.7%, men,37.3%, in 2015:in women,95.6%, in men 4.4%, in 2016:it was 80.3% in women and 19.7% in men. Also, in 2017:in women,79.9%,20.1 in men, and the year 2018 had prevalence of secondary infertility among women,78.0% and 21.1% among men.
Conclusion: The prevalence of female infertility was significantly higher than that of male during the last five years. The prevalence of primary infertility is higher than secondary infertility among both genders included in this study.

Keywords: secondary, primary, included, Organization

Introduction

According to the World Health Organization [WHO], about 60 to 80 million couples in the world have difficulties in getting pregnant and suffer from infertility as a universally common pr oblem [1].

In the second decade of the new millennium, infertility remains a highly prevalent global condition. Infertility is estimated to affect between 8 and 12% of reproductive-aged couples worldwide [2] the rates of infertility are much higher, reaching-30% in some populations [3]. in developing countries. The prevalence of current infertility in developed and less developed countries, based on systematic review, was between 3.5-16.7%and 6.9-9.3% respectively. Also, it is 9% in China, in America10-15% in Siberia about 16% and in Australia19%. with increasing rate about 32% in some region affected within Africa [4]. 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 [5]. A rule of third can be applied, one third of infertile couple can be attributed to male reproductive cause alone, one third can be attributed to female causes alone and one third can be attributed to male and female causes [6]. Male infertility alone accounts for up to half of all cases of infertility and affects one man in 20 in the general population of which 10% is due to azoospermia [7].

Infertility is defined as no pregnancy after one-year unprotected coitus [8] Potential infertility is considered as a serious health problem worldwide. I nfertility affects the individual, family and community through, psychological, social and economic consequences. Social consequances include couples argument, violence, stigma, isolation and divorce [9]. An ESHRE workgroup estimated that 1500 couples per million population required ART treatment annually [ESHRE Cpri Workshop Group, 2001].Today, The Middle East boasts of one of the strongest ART industries in the world, with more than 110 IVF clinics in Turkey more than 70 in Iran more than 50 in Egypt and more than dozen clinics in many smaller countries, such as Lebanon and the UAE [10].

Materials and Methods

A retrospective study applied during 2019 in Iraq to assess the infertility prevalence for men and women visited public outpatient clinics of infertility according to the type of their infertility [primary and secondary] in different governorates except Kurdistan during the years 2014,2015,2016,2017 and 2018.The total sample size was[568469],including the five years visitors [males and females],divided to 182837 during 2014,126486 in 2015,93013 in 2016,73631in 2017 and 92502 during 2018.The data collected from different infertility public outpatients clinics distributed around Iraqi governorates for visitors in their reproductive age [15, 49] years, prepared by specialist doctors and nurses, including the classification into primary and secondary, where primary infertility describes men or women who have never been able to conceive with unprotected intercourse for one year. While Secondary infertility was applied for those who had get pregnancy at least once, but have not been able to have it

again.

Full medical and socio-demographic history taken for both men and women followed by complete diagnostic infertility investigations as hormonal assays for women consisted of FSH, LH, PRL, estradiol [E2], Progesterone[P4] and thyroid stimulating hormone [TSH] in addition to the physical exam and Ultra sound assessment. For men serum LH,FSH, and testosterone also detection of HIV, HCVand HBs Ag. The semen was analyzed onto asthenozoospermia[ie, progressive motility of spermatozoa below 32%], oligozoospermia [i.e.spermatozoa concentration below150000/ ml], teratozoospermia [i.e. morphologically normal spermatozoa below 4%],asthenoteratozoospermia, cryptozoospermia, haemospermia, leukospermia, necrozoospermia, ejaculate. Statistical analyses were performed using SPSS statistical package for Social Sciences [version 21.0 for windows, SPSS, Chicago. IL USA]. P value of below0.05 was considered statistically significant.

The prevalence 0f infertility was done based on WHO formula of Reproductive Health Indicators as shown

Prevalence [P]

P=Total. No of patients in their reproductive age[15-49]yrs., at risk of conceiving but unable to conceive for at least 1 year multiplied by 100 devided by total No. of patients in their reproductive age who reported to the hospital within the study period, aged [15-49] yrs., at risk of becoming pregnant.

Results

The sample size of this study was 568469 represented the total number of visitors to Iraqi outpatient clinics of infertility covering the whole governorates except Kurdistan during, last five years [2014-2018], according to their type of infertility [primary and secondary] with their gender. The number of visitors differs in each year according to the registered patients of men and women.

In 2014 the total number of visitors was 182837 the females were 133775 [p=73.2%] while the males were 4906[26.8%].

Tables 1: distribution of primary and secondary infertility in different governorates according to gender in 2014.

2014	Primary infertility			Secondary infertility			Grand total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Baghdad	19027	60255	79282	14041	24233	38274	33068	84488	117556
Basrah	1142	11472	12614	3841	1855	5696	4983	13327	18310
Ninevah									
Maysan	16	2669	2685	4	1018	1022	20	3687	3707
Al Dewaniya	500	360	860	170	407	577	670	767	1437
Diala	152	1929	2081	101	724	825	253	2653	2906
Al Anbar									
Babylon	528	1383	1911	208	883	1091	736	2266	3002
Kerbela	460	3509	3969	351	1135	1486	811	4644	5455
Kirkuk	118	1670	1788	9	1006	1015	127	2676	2803
Wasit	609	2723	3332	2192	857	3049	2801	3580	6381
Thi Qar	1601	4481	6082	815	2552	3367	2416	7033	9449
Al Muthanna	133	417	550	34	248	282	167	665	832
Salah Al Deen									
Al Najaf	2771	5986	8757	239	2003	2242	3010	7989	10999
Grand total	27057	96854	123911	22005	36921	58926	49062	133775	182837

The prevalence of primary and secondary infertility in each governorate for both gender (%) during 2014.

2014	Primary infertility			Secondary infertility			Grand total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Baghdad	15.4%	48.6%	64.0%	23.8%	41.1%	65.0%	18.1%	46.2%	64.3%
Basrah	0.9%	9.3%	10.2%	6.5%	3.1%	9.7%	2.7%	7.3%	10.0%
Ninevah									
Maysan	0.0%	2.2%	2.2%	0.0%	1.7%	1.7%	0.0%	2.0%	2.0%
Al Dewaniya	0.4%	0.3%	0.7%	0.3%	0.7%	1.0%	0.4%	0.4%	0.8%
Diala	0.1%	1.6%	1.7%	0.2%	1.2%	1.4%	0.1%	1.5%	1.6%
Al Anbar									
Babylon	0.4%	1.1%	1.5%	0.4%	1.5%	1.9%	0.4%	1.2%	1.6%
Kerbela	0.4%	2.8%	3.2%	0.6%	1.9%	2.5%	0.4%	2.5%	3.0%
Kirkuk	0.1%	1.3%	1.4%	0.0%	1.7%	1.7%	0.1%	1.5%	1.5%
Wasit	0.5%	2.2%	2.7%	3.7%	1.5%	5.2%	1.5%	2.0%	3.5%
Thi Qar	1.3%	3.6%	4.9%	1.4%	4.3%	5.7%	1.3%	3.8%	5.2%
Al Muthanna	0.1%	0.3%	0.4%	0.1%	0.4%	0.5%	0.1%	0.4%	0.5%
Salah Al Deen									

Al Najaf	2.2%	4.8%	7.1%	0.4%	3.4%	3.8%	1.6%	4.4%	6.0%
Grand total	21.8%	78.2%	100.0%	37.3%	62.7%	100.0%	26.8%	73.2%	100.0%

In 2015 the total visitors number was 126486.females were123246[p=97.4%] and males were 3240[p=2.6%]. During 2016 the whole visitors were 93013, the women were71395[p=76.8%] while the males were 21618[p=23.9%].

Tables 2: distribution of primary and secondary infertility in different governorates according to gender in 2015.

2015	Primary infertility			Secondary infertility			Grand total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Baghdad	1765	59067	60832	1009	20765	21774	2774	79832	82606
Basrah	10	10457	10467	8	780	788	18	11237	11255
Ninevah									
Maysan	0	1234	1234	0	1601	1601	0	2835	2835
Al Dewaniya	0	554	554	0	363	363	0	917	917
Diala	10	2384	2394	0	1081	1081	10	3465	3475
Al Anbar									
Babylon	0	2155	2155	36	1344	1380	36	3499	3535
Kerbela	0	2647	2647	21	960	981	21	3607	3628
Kirkuk	1	1193	1194	265	313	578	266	1506	1772
Wasit	0	1086	1086	33	408	441	33	1494	1527
Thi Qar	0	1905	1905	0	584	584	0	2489	2489
Al Muthanna	0	1517	1517	3	419	422	3	1936	1939
Salah Al Deen									
Al Najaf	0	7697	7697	79	2732	2811	79	10429	10508
Grand total	1786	91896	93682	1454	31350	32804	3240	123246	126486

The prevalence of primary and secondary infertility in each governorate for both gender (%) during 2015.

2015	Primary infertility			Secondary infertility			Grand total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Baghdad	1.9%	63.1%	64.9%	3.1%	63.3%	66.4%	2.2%	63.1%	65.3%
Basrah	0.0%	11.2%	11.2%	0.0%	2.4%	2.4%	0.0%	8.9%	8.9%
Ninevah									
Maysan	0.0%	1.3%	1.3%	0.0%	4.9%	4.9%	0.0%	2.2%	2.2%
Al Dewaniya	0.0%	0.6%	0.6%	0.0%	1.1%	1.1%	0.0%	0.7%	0.7%
Diala	0.0%	2.5%	2.6%	0.0%	3.3%	3.3%	0.0%	2.7%	2.7%
Al Anbar									
Babylon	0.0%	2.3%	2.3%	0.1%	4.1%	4.2%	0.0%	2.8%	2.8%
Kerbela	0.0%	2.8%	2.8%	0.1%	2.9%	3.0%	0.0%	2.9%	2.9%
Kirkuk	0.0%	1.3%	1.3%	0.8%	1.0%	1.8%	0.2%	1.2%	1.4%
Wasit	0.0%	1.2%	1.2%	0.1%	1.2%	1.3%	0.0%	1.2%	1.2%
Thi Qar	0.0%	2.0%	2.0%	0.0%	1.8%	1.8%	0.0%	2.0%	2.0%
Al Muthanna	0.0%	1.6%	1.6%	0.0%	1.3%	1.3%	0.0%	1.5%	1.5%
Salah Al Deen									
Al Najaf	0.0%	8.2%	8.2%	0.2%	8.3%	8.6%	0.1%	8.2%	8.3%
Grand total	1.9%	98.1%	100.0%	4.4%	95.6%	100.0%	2.6%	97.4%	100.0%

Table 3: distribution of primary and secondary infertility in different governorates according to gender in 2016.

2016	Primary infertility			Secondary infertility			Grand total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Baghdad	10613	27396	38009	3626	12905	16531	14239	40301	54540
Basrah	864	6819	7683	44	836	880	908	7655	8563
Ninevah									
Maysan	33	1288	1321	0	1814	1814	33	3102	3135
Al Dewaniya	80	94	174	66	91	157	146	185	331
Diala	228	2001	2229	75	581	656	303	2582	2885
Al Anbar									
Babylon	464	1461	1925	187	1193	1380	651	2654	3305
Kerbela	1246	2577	3823	543	682	1225	1789	3259	5048
Kirkuk	468	1225	1693	189	313	502	657	1538	2195
Wasit	394	430	824	136	167	303	530	597	1127
Thi Qar	3	895	898	0	130	130	3	1025	1028
Al Muthanna	76	1896	1972	0	2	2	76	1898	1974
Salah Al Deen									
Al Najaf	2119	4817	6936	164	1782	1946	2283	6599	8882
Grand total	16588	50899	67487	5030	20496	25526	21618	71395	93013

The prevalence of primary and secondary infertility in each governorate for both gender (%) during 2016.

2016	Primary infertility			Secondary infertility			Grand total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Baghdad	15.7%	40.6%	56.3%	14.2%	50.6%	64.8%	15.3%	43.3%	58.6%
Basrah	1.3%	10.1%	11.4%	0.2%	3.3%	3.4%	1.0%	8.2%	9.2%
Ninevah	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Maysan	0.0%	1.9%	2.0%	0.0%	7.1%	7.1%	0.0%	3.3%	3.4%
Al Dewaniya	0.1%	0.1%	0.3%	0.3%	0.4%	0.6%	0.2%	0.2%	0.4%
Diala	0.3%	3.0%	3.3%	0.3%	2.3%	2.6%	0.3%	2.8%	3.1%
Al Anbar	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Babylon	0.7%	2.2%	2.9%	0.7%	4.7%	5.4%	0.7%	2.9%	3.6%
Kerbela	1.8%	3.8%	5.7%	2.1%	2.7%	4.8%	1.9%	3.5%	5.4%
Kirkuk	0.7%	1.8%	2.5%	0.7%	1.2%	2.0%	0.7%	1.7%	2.4%
Wasit	0.6%	0.6%	1.2%	0.5%	0.7%	1.2%	0.6%	0.6%	1.2%
Thi Qar	0.0%	1.3%	1.3%	0.0%	0.5%	0.5%	0.0%	1.1%	1.1%
Al Muthanna	0.1%	2.8%	2.9%	0.0%	0.0%	0.0%	0.1%	2.0%	2.1%
Salah Al Deen	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Al Najaf	3.1%	7.1%	10.3%	0.6%	7.0%	7.6%	2.5%	7.1%	9.5%
Grand total	24.6%	75.4%	100.0%	19.7%	80.3%	100.0%	23.2%	76.8%	100.0%

In 2017 the total sample size was 73631, the "infertile women were 57440[p=78.0%].and the infertile men were 16191[p=22.0%].Also in 2018 the total number was 92502,the females were 73095[p=79.0%] and the males were 19407[p=21.0%].

Table 4: distribution of primary and secondary infertility in different governorates according to gender in 2017.

2017	Primary infertility			Secondary infertility			Grand total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Baghdad	7533	24079	31612	3772	16242	20014	11305	40321	51626
Basrah	94	3002	3096	1	492	493	95	3494	3589
Ninevah			0			0	0	0	0
Maysan	1	54	55	0	21	21	1	75	76
Al Dewaniya	3	11	14	0	8	8	3	19	22
Diala	126	940	1066	51	358	409	177	1298	1475
Al Anbar	301	102	403	214	167	381	515	269	784
Babylon	223	602	825	110	570	680	333	1172	1505
Kerbela	541	1628	2169	410	573	983	951	2201	3152
Kirkuk	287	894	1181	154	276	430	441	1170	1611
Wasit	433	463	896	180	170	350	613	633	1246
Thi Qar	5	123	128	0	0	0	5	123	128
Al Muthanna	43	1293	1336	4	0	4	47	1293	1340
Salah Al Deen	243	253	496	200	229	429	443	482	925
Al Najaf	1115	3155	4270	147	1735	1882	1262	4890	6152
Grand total	10948	36599	47547	5243	20841	26084	16191	57440	73631

The prevalence of primary and secondary infertility in each governorate for both gender (%) during 2017.

2017	Primary infertility			Secondary infertility			Grand total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Baghdad	15.8%	50.6%	66.5%	14.5%	62.3%	76.7%	15.4%	54.8%	70.1%
Basrah	0.2%	6.3%	6.5%	0.0%	1.9%	1.9%	0.1%	4.7%	4.9%
Ninevah									
Maysan	0.0%	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%	0.1%
Al Dewaniya	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Diala	0.3%	2.0%	2.2%	0.2%	1.4%	1.6%	0.2%	1.8%	2.0%
Al Anbar	0.6%	0.2%	0.8%	0.8%	0.6%	1.5%	0.7%	0.4%	1.1%
Babylon	0.5%	1.3%	1.7%	0.4%	2.2%	2.6%	0.5%	1.6%	2.0%
Kerbela	1.1%	3.4%	4.6%	1.6%	2.2%	3.8%	1.3%	3.0%	4.3%
Kirkuk	0.6%	1.9%	2.5%	0.6%	1.1%	1.6%	0.6%	1.6%	2.2%
Wasit	0.9%	1.0%	1.9%	0.7%	0.7%	1.3%	0.8%	0.9%	1.7%
Thi Qar	0.0%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	0.2%	0.2%
Al Muthanna	0.1%	2.7%	2.8%	0.0%	0.0%	0.0%	0.1%	1.8%	1.8%
Salah Al Deen	0.5%	0.5%	1.0%	0.8%	0.9%	1.6%	0.6%	0.7%	1.3%
Al Najaf	2.3%	6.6%	9.0%	0.6%	6.7%	7.2%	1.7%	6.6%	8.4%
Grand total	23.0%	77.0%	100.0%	20.1%	79.9%	100.0%	22.0%	78.0%	100.0%

The infertile females with primary infertility were96854[p=78.2%] in 2014,91896[p=98.1%]

in2015,50899[p=75.4%] in 2016,36599[p=77.0%] in 2017 and 49101[p=79.1%] during 2018.
While the primary infertile males were 2705[p=21.8%] in 2014,1786[p=2.6%] in 2015,16588 p=24.6] in 2016,10948[p=23.0%] in2017 and 12995[p=20.9%] in2018.

Table 5: distribution of primary and secondary infertility in different governorates according to gender in 2018.

2018	Primary infertility			Secondary infertility			Grand total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Baghdad	7981	24989	32970	4890	17529	22419	12871	42518	55389
Basrah	1169	4084	5253	75	432	507	1244	4516	5760
Ninevah	407	1084	1491	403	383	786	810	1467	2277
Maysan	255	432	687	246	517	763	501	949	1450
Al Dewaniya	177	57	234	79	44	123	256	101	357
Diala	89	873	962	74	562	636	163	1435	1598
Al Anbar	0	9525	9525	6	84	90	6	9609	9615
Babylon	82	289	371	30	343	373	112	632	744
Kerbela	138	953	1091	72	310	382	210	1263	1473
Kirkuk	229	1391	1620	64	317	381	293	1708	2001
Wasit	689	770	1459	254	332	586	943	1102	2045
Thi Qar	29	178	207	31	48	79	60	226	286
Al Muthanna	34	504	538	0	768	768	34	1272	1306
Salah Al Deen	300	835	1135	188	518	706	488	1353	1841
Al Najaf	1416	3137	4553	0	1807	1807	1416	4944	6360
Grand total	12995	49101	62096	6412	23994	30406	19407	73095	92502

The prevalence of primary and secondary infertility in each governorate for both gender (%) during 2018.

2018	Primary infertility			Secondary infertility			Grand total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Baghdad	12.9%	40.2%	53.1%	16.1%	57.6%	73.7%	13.9%	46.0%	59.9%
Basrah	1.9%	6.6%	8.5%	0.2%	1.4%	1.7%	1.3%	4.9%	6.2%
Ninevah	0.7%	1.7%	2.4%	1.3%	1.3%	2.6%	0.9%	1.6%	2.5%
Maysan	0.4%	0.7%	1.1%	0.8%	1.7%	2.5%	0.5%	1.0%	1.6%
Al Dewaniya	0.3%	0.1%	0.4%	0.3%	0.1%	0.4%	0.3%	0.1%	0.4%
Diala	0.1%	1.4%	1.5%	0.2%	1.8%	2.1%	0.2%	1.6%	1.7%
Al Anbar	0.0%	15.3%	15.3%	0.0%	0.3%	0.3%	0.0%	10.4%	10.4%
Babylon	0.1%	0.5%	0.6%	0.1%	1.1%	1.2%	0.1%	0.7%	0.8%
Kerbela	0.2%	1.5%	1.8%	0.2%	1.0%	1.3%	0.2%	1.4%	1.6%
Kirkuk	0.4%	2.2%	2.6%	0.2%	1.0%	1.3%	0.3%	1.8%	2.2%
Wasit	1.1%	1.2%	2.3%	0.8%	1.1%	1.9%	1.0%	1.2%	2.2%
Thi Qar	0.0%	0.3%	0.3%	0.1%	0.2%	0.3%	0.1%	0.2%	0.3%
Al Muthanna	0.1%	0.8%	0.9%	0.0%	2.5%	2.5%	0.0%	1.4%	1.4%
Salah Al Deen	0.5%	1.3%	1.8%	0.6%	1.7%	2.3%	0.5%	1.5%	2.0%
Al Najaf	2.3%	5.1%	7.3%	0.0%	5.9%	5.9%	1.5%	5.3%	6.9%
Grand total	20.9%	79.1%	100.0%	21.1%	78.9%	100.0%	21.0%	79.0%	100.0%

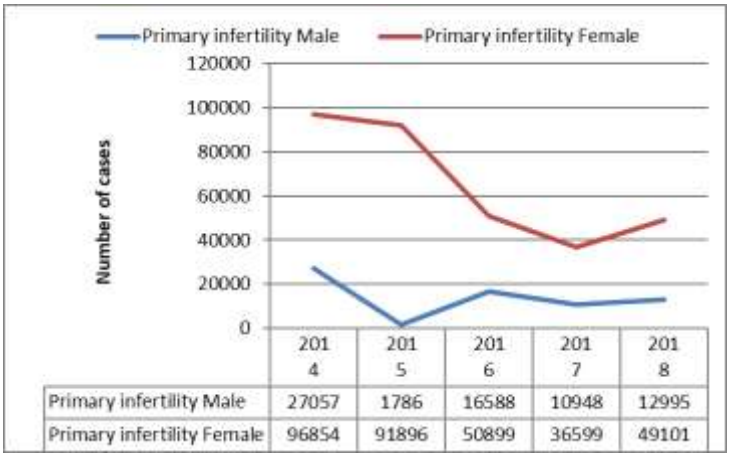
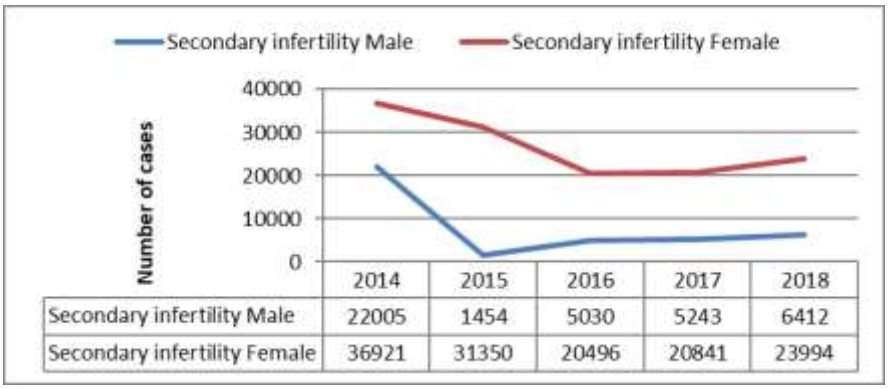


Fig 1: Prevalence of primary infertility in Iraqi governorates (except Kurdistan) according to gender for the years 2014-2018.

The female visitors with secondary infertility were36921[p=62.7%] in 2014,31350[p=95.6%] in 2015,20496[p=80.3%]in2016,20841[p=79.9%] in 2017 and 23994[p=78.9%] during 2018.
The secondary infertile men visitors were 22005[p=37.35]IN 2014,1454[P=4.4%] in 2015,21618[p=19. 7%] in

2016,5243[p=20.1%]in 2017 and 6412[p=21.1%] in2018.



	2014	2015	2016	2017	2018
Secondary infertility Male	22005	1454	5030	5243	6412
Secondary infertility Female	36921	31350	20496	20841	23994

Fig 2: Prevalence of secondary infertility in Iraqi governorates (except Kurdistan) according to gender for the years 2014-2018.

Baghdad as a capital of Iraq had highest prevalence of both males and females infertility types during the last five years,in 2014,primary infertile females prevalence was48.6%,andmales,15.4%.While the secondary infertility prevalence was41.1% for females and23.8% for males.in 2015 the prevalence of female and male primary infertility was 63.1% and1.9% respectively,while those for secondary infertility females and males were 63.3%,3.1%,respectively.In2016 the female and male primary infertility prevalence were 40.6%,15.7% respectively, while the secondary infertility prevalence for females was50.6% and males was14.2%.The prevalence of female primary infertility during 2017 was50.6% and that of males 15.8%,but the secondary infertile females prevalence was62.3% and that for males was14.5%.

Baghdad in2018 had prevalence of females and male's primary infertility,40.2% and 12.9% respectively, while those with secondary infertility had 57.6% for females and 16.1% for males.

Other governorates showed less prevalence of infertility of both types for both genders if compared with Baghdad although Kurdistan was not included in this study, in addition to the absence of data from Ninevah,Al Anbar and Salah Aldeen during the years from 2014 till 2016.

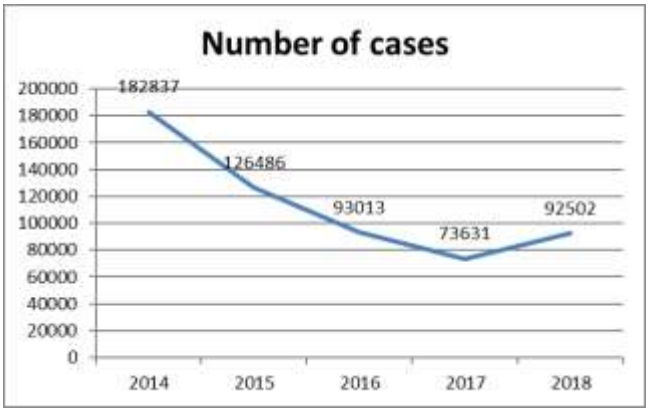


Fig 3: Total number of cases (both genders and all infertility cases) in Iraq governorates (except Kurdistan) according to year.

Discussion

Although good documentation of the prevalence of infertility is lacking, it is generally believed that more than 70 million couples suffers from infertility worldwide, the majority being residents of developing countries [5].

Health care providers should be aware of the prevalence of infertility to estimate the liklehood of seeking and undergoing infertility evaluation and treatments [1].

In our study the visitors of Iraqi outpatient clinics of infertility were divided into five groups included according to time of visits to2014[182837],2015[126486],2016[93013],2017[73631] and in 2018[92502]. Covering all the governorates except Kurdistan, the data of Ninevah,Slah ALDEEN and AL Anbar during 2014 to 2017 were not available because of the Civil war in Iraq affected those governorates.

The prevalence of total female infertility found to be higher than total male infertility [73.2%][133775] in 2014,in 2015 [97.4%][123246],in 2016 [76.8%] [71395],in 2017[78.0%] [57440]and in2018 was [79.0%] [73095].while the prevalence of infertile males was [26.8%][49062] in 2014,[2.6%] [3240] in 2015,in 2016[23.2%] [21618],in 2017[22.0%] [16191]and during 2018 [21.0%]

The same result found in United States by Anjani *et al* during 2010 were men reported as impaired fecundity aged [25_44] were 12% and those [15_44] were 9.4% while the women aged [15_44] had 11% and older women [25_44] had 12%.[11].

Also female infertility found to be higher [35.68%] than male infertility [19.73%] among infertile couples in Erbil during 2012.[5].That was because male infertility remains a hidden reproductive health condition even though it contributes to more than half of all cases of childlessness worldwide[12],so infertility remains a women s social burden [13], as a result women with infertile husbands are often mistakenly blamed for the childlessness, sometimes they also protect their infertile husbands by claiming the infertility problem as their own[14].also in Iran Yazd female infertility was 44.3% more than male factor infertility 40%.Opposed by the results of Royan Institute were the most common causes of infertility among couples was male infertility [50.5%],in Turkey male factor found to be more [32.8%] than female cause [30.5%] in 2010 while in Douhok Iraq the male infertility was found in 36.8% couples [15]. However these figures do not accurately represents all regions of the world. The study of Agarwal *et al*, showed that male ifertility rates were highest in Africa and Central Eastern Europe, whereas corresponding rates for North America, Australia and Central and Eastern Europe varied from 4.5 _6%,9% and 8_12%, respectively [16]. May be because of high social and educational states of these countries normalizing of both male and female infertility problems as medical conditions that can be overcome, in addition to decreased stigma, blame and social suffering for

both men and women [10]. But the Iraqi Civil war probably had the main cause of decreased rate of male visitors during last five years especially in the affected governorates.

In this study the primary infertility prevalence found to be significantly higher than secondary causes among females attending infertility outpatient clinics during the last five years for the patients included,in 2014 Iraqi women with primary infertility prevalence was [78.2%][96854], in 2015 [98.1%] [91896], in2016[75.4%][50899],in 2017[77.0%] [36500]and during 2018 it was [79,1%] [49101]. While the prevalence of female visitors with secondary infertility in 2014 was[62.7%] [36921],in 2015[95.6%][31350], in 2016[80.3%][20496],in 2017[79.9%][20841]and in 2018[78.9%][2394].The prevalence of primary infertility based on the WHO s clinical, epidemiological and demographic definitions were 20.2,12.8 and9.2%, respectively. In addition, secondary infertility rate was 4.9%.[1].

The nearest study with similar results found in Al Najaf during 2016 that confirmed that women with primary infertility had most common type of infertility especially among urban residents.[prevalence 60% while secondary infertility 40%[4].also in Morocco study during 2015 conducted for infertile women who were referred to public and private centers revieled that rates of primary and secondary infertility were 67.37% and 32.63% respectively[17],the same was found in Yazd among 135 women participating the infertility prevalence estimation were 2.6% of them had primary infertility and 2.1% had secondary infertility during 2013_2014[8].the same was found in Duhok Iraq among 250 infertile couples primary infertility was 72.2%and 22.8% had secondary infertility, in Turkey 73.1% of women had primary infertility, it seems that it is more common in Iraq,Iran and Turkey.Also in Sudan 80%of infertile couples suffered from primary infertility[5]. Also, between 2010_2011 the prevalence of infertility among women who could become pregnant in China was 15.5% [n =17275], with the prevalence of primary infertility and secondary infertility being 9.5%[n=1644] and 6.0%[n=1036], respectively. [24l].

Those similar results in confirming increased prevalence of primary infertility than secondary infertility among females visitors could be because the couples with primary infertility have never achieved a live birth during the course of their union and hence more likely to be stigmatized[18] On the other hand in Arabic culture, motherhood perceived as the core of womanhood and infertile women are left and may exposed to violence by their husbands and community the same found in Africa andTurkey.[19].Also in primary infertility, the majority of women with relatively high to moderate socio-economic status are able to resolve their infertility problems.[17], and in general primary infertility had higher treatment success rates compared with secondary infertility,[18].

However another studies showed significant increase in female secondary infertility prevalence like in Africa were secondary infertility was significantly higher[66.10 vs44.20][20] in Ghana the secondary infertility was higher among females from 2011 to 2015[18]The same results found in sub-Saharan African countries surveyed in 2002,the secondary infertile percentage of women was more than 25%reaching to 30% indeed in Zimbabwe alone the rate of female secondary infertility estimated as62% also other regions include South Asia, East Asia and the Pacific,Central andEastern Europe and Central Asia and Post-Soviet regions the rates range between 16 and 25% [21].

Probably because of high rate of unsafe abortions in addition to reproductive tract infections and HIV infections [10].

Our Iraqi male visitors with primary infertility showed higher prevalence than those with secondary infertility included in our study in all the governorates.In 2014 the prevalence of primary infertility [21.8%] [27057] in 2015 [1.9%] [1786],2016 [24.6%][16588],2017[23.0%][10948]and during 2018 [20.9%] [12995].

While the prevalence of male secondary infertility was in 2014[37.3%] [22005],2015[4.4%] [1454], in 2016[19.7%] [5030],2017[20.1%] [5243] and in 2018 [21.1%] [6418].

That coincide with a result of similar studies done for evaluation of primary and secondary prevalence among infertile couples visited infertility centers of Morocco that found that sperm abnormality was the major cause of male primary infertility [45.1%] compared to secondary infertility [20.3%] [17].

In Erbil Iraq also an estimation of prevalence of different types of infertility confirmed that primary infertility among men was [61.35%] whereas that of secondary infertility was [38.75%] [[5]. Also a study done in Ghana to assess the prevalence of infertility and the effectiveness and success of pharmacotherapy among men enrolled only [13.6%]had Sperm anomalies [n=112] from them oligozoospermia were [58%] [n=65] and 30% of men were Oligoasthenospermia and one in every six had Azoospermia.[18]. Primary infertility was common health problems in couples suffer from infertility worldwide especially those of developing countries residents [5], despite the differing estimates of global infertility prevalence and the complete absence of information on the total number of infertile men, who contribute to more than half of all cases of childlessness [,22],moreover, some research based on psychological distress instruments has shown that both men and women suffer from high levels of psychological distress related to their infertility especially primary type[23.],that make primary infertile male and females to attend the infertility outpatients clinics as soon as conception delayed.

In comparison of the prevalence of infertility for the Iraqi visitors among the governorates Baghdad had the highest prevalence of primary and secondary infertility for both men and women. Of course, Baghdad as a Capital of Iraq has the highest residents of population, more outpatient's infertility clinics and best drainage goal for almost all governorates.

As a result of our research to find the total number of infertility visitors during the last five years there Was a well observed decrease of total number of annual visitors from 2014 [182837],2015[126486],2016[93013],2017[73631] to 2018[92502].Probably that coincide with the global information that indicate a decrease of infertility rates significantly over the past two decades[21]This is partly because global fertility rates have dropped significantly ie fewer people are trying to have children as population growth has slowed[ESHRE Task Force 2009,21].

In addition to the increased number of IVF and infertility private centers in Iraq that solved most of infertility problems and attract many infertile men and women decreasing total number of visitors to the public outpatient clinics of infertility, moreover to the increased facilitated journies of IVF and ICSI treatments abroad.

Conclusion

As shown by this study there was a significant increase in the prevalence of female infertility of primary and secondary types than that of males. Females with primary infertility had higher prevalence than secondary infertility, that was similarly found among infertile male visitors.The results were different between Iraqi governorates however Baghdad had the highest levels. There was a significant decrease in total number of visitors to the public outpatient clinics of infertility in our country dropping gradually through the years 2014 till 2018.

Recommendations

According to these findings, more efforts are essentials to encourage the young couples to Visit the infertility clinics for any delay of conception after one year of unprotected intercourse, with increasing health education programs that removed the social stigma around the infertile couples both males and females, in addition to further studies have to be done involving the private clinics visitors and during present years, with different living circumstances to have more accurate results.

References

1. Mohammad M, Fahime R, Mahdi SH, Zuhre B, Koorosh K, Kazem M. Practical Diffculties in Estimating The Prevalence of Primary Infertility in Iran.International Journal of Fertility and Sterility. 2019; 13(2):113-117.
2. Omblet W, Cooke I, Dyer S, Serour G, Devroey P. Infertility and the provision of infertility medical services in developing countries. Hum Reprod. Update. 2008; 14(6):605-621.
3. Rutstein SO, Shah IH. Infecundity, infertility, and childlessness in developing countries. DHS Comparative Reports No. 9. World Health Organization. Geneva. Swizerland, 2004.
4. Abeer M, Shukriyia Sh. Risk Factors of Infertility Among Young Women at Al-Najaf December, 2016.
5. Azah B, Khanzad H. Etiology of infertility in couples attending maternity hospital in Erbil. Zanco 3.Med. Sci, 2013, 17(1).
6. Meacham RB, Joyce GF, Wise M, Kparkar A, Niederberger C. Male infertility. J Urol. 2007; 177:2058-66.
7. Johanson MH, Cohen J, Grudzinskas G. Accessable and affordable IVF:is Bob Edwards dream about to become reality! Reprod Biomed Online. 2014; 28:265-266.
8. Masoud M, Nasim N, Razich D, Somaye Gh. The prevalence of infertility in 20-49 years w0men in Yazd, 2014-2015: A cross-sectional study. Int. J Reprod BioMed Vol.16. No.11.pp:683-688, November 2018.
9. Vayena E, Rowe PJ, Peterson HB. Assisted reproductive technologies in developing countries: are we caring yet! Fertil Steril. 2009; 92:413-416.
10. Marcia C. and Pasquale P. Infertility around the globe:new thinking on gender, reproductive technologies and global movements in the 21st century. Human Reproduction Update. 2015; 21(4):411-426.
11. Anjani CH, Casey E, Elizabeth H. Infertility and impaired Fecundity in the United States,1982-2010: Data From the National Survey of Family Growth. National Health Statistics Reports Number 67: August 14, 2013.
12. Irvin DS, Epidemiology and aetiology of male infertility. Human Reprod. 1998: 13(Suppl,1):33-44.
13. Inhorn MC. Cosmopoliton Conception: IVF Sojourns in Global Dubai. Durham NC: Duke University Press,2015.
14. Inhorn MC, Tremayne S(eds). Islam and Assisted Reproductive Technologies: Sunni. 15. Razzak AH, Wais SA. The infertile couple: A cohort study in Duhok, Iraq, Est Mediterr Health J. 2002; 8(2-3):234-238. and Shia Perspectives. New York and Oxford: Berghahn, 2012.
15. Melodie V, Christine W. Fertility and infertility: Definition and epidemiology. Clinical Biochemistry (2018),https:|| dot. Org|j.clinbiochem, 2018, 03:012.
16. Abdelhafid B, Noureddine EL, Rachid A, Abdelllatif B, Mohamed Ch. Difference between Primary and Secondary Infertility in Morocco: Frequencies and Associated Factors.International Journal of Fertility and Sterility. 2018; 12(2):141-146.
17. Stephen M, Kwesi B, Evans Ag, Vitus S, Charles A. Pharmacotherapy of infertility in Ghana: retrospective study at cape coast teaching hospital. Journal of Pharmceutical Policy and Practice https |dol.org|10.1186|s40545-019-0191-0.
18. Emine Y, Funda K. The effect of stigma on depression levels of Turkish women with infertility. Wiley Periodicals Inc. :23 June, 2018.Dol:10.1111 |ppc.12319
19. Ugwuja El, Ugwu, NC, Ejikeme BN. Prevalence of Low sperm Count and Abnormal Semen Parameters in Male Partners of Women Consulting at infertility Clinic in Abakaliki, Nigeria. Rev Afr Sante Reprod. 2008; 12(1):67-73.
20. Mascarenhas MN, Flaxman SR,Boema T,Vanderpoel S, Steven GA. National regional and global trends in infertility prevalence since1990 a systematic analysis of 277 health surveys. Plos Med. 2012; 9(12):e1001356.
21. World Health Organization WHO Laboratory Manual for the Examination and Processing of Human Semen. WHO Geneva. Switzerland, Sexual and Reproductive health, infertility is a global public health issue. http|www.who.int|reproductive health| topics| infertility| perspective|en|. (23 October 2014,date.last accessed).
22. Fledderjohann JJ. Zero is not good for me: implications of infertility in Ghana.Human Reproduction. 2012; 27(5):1383-1390.
23. Zhou Z, Zheng D, Wu H, *et al*. Epidemiology of infertility in China: a population-based study. BJOG An International Journal of Obstetrics and Gynecology Dol:10.1111|1471-0528.14966 www.bjog.org.