

Original Research Article

Epidemiologic Evaluation on Infertility in the Isparta CitySelami Kara¹, Hilmi Baha Oral², Umut Gök Balcı³, Kurtuluş Öngel³¹Spec. Dr., TC. Ministry of Health Tuberculosis Dispensary, Isparta, Turkey²Prof. Dr., Süleyman Demirel University, Dep. of Obstetric and Gynecology, Isparta, Turkey³Spec. Dr., Tepecik Education and Research Hospital, Clinic of Family Medicine, Izmir, Turkey⁴Assoc. Prof. Dr., Izmir Katip Celebi University, Dep. of Family Medicine, Izmir, Turkey***Corresponding author**

Kurtuluş ÖNGEL

Email: kurtulusongel@gmail.com

Abstract: Infertility is inability to have a child without will, and with a broader definition, if a married couple, having sexual intercourse at least for a year without contraceptives, has not conceived it is considered to be a case of infertility. Aim of this study is to detect the frequency of infertility in the city of Isparta and to investigate general demographic and epidemiological properties of infertile individuals. Considering 15-49 aged population in Isparta city, a sample size of 3406 cases was calculated. Calculated sample size was distributed among districts of Isparta according to the age ratios of each district. Study included volunteers accepting to participate in study with signing informed consent form. Included cases were all from age of 15 to 49 and have been married for at least one year at the time they were included to the study. Participants completed a 28 questioned survey with face to face interviews to detect if they fit the primary or secondary infertility criteria. Cases, fitting the primary or secondary infertility criteria according to the first survey, completed another survey consists of 34 questions for women and 42 questions for men. Of 3406 cases included to the study, 1006 (29.7%) were male and 2400 (70.3%) were female. 7.7% of all 3406 cases (n=262) fit the infertility criteria. 170 of 262 infertile cases (64.9%) fit primary and 92 (35.1%) fit secondary infertility criteria. Sociodemographic features and information about pregnancy were taken into account in the manuscript.

Keywords: Epidemiology, infertility, prevalence.

INTRODUCTION

Infertility is in common inability to have a child without will. Infertility divides into two main groups; if a married couple, having sexual intercourse regularly at least for 12 months without contraceptives (2-3 times in a week) has not conceived it is considered as primary infertility; having a live born pregnancy history of the but later despite having sexual intercourse 12 months without contraceptives has not conceived it is named as secondary fertility [1].

Infertility is seen to 8-10% of couples in developed countries. While primary infertility proportions are low in developing countries where reproduction system infection is being diffuse, secondary fertility is much more [1]. Infertility takes more attention as a reproduction condition in 20 years. World Health Organization (WHO) estimates that there are 60-80 million infertile couples [2]. Male is responsible for 30-40% of couples, female is responsible for 40-50% of couples. In 10-15% of couples have infertility without explaining with present standard diagnostic tests nowadays. Acquired secondary infertility forms a major part of the frequency of infertility. The most common and important reason is pelvic

infections due to sexually transmitted diseases, unsafe abortion and puerperal infections. Controversies about ethical, moral and legal remain despite major advances in the treatment of infertility in recent years [3]. Although the causes of infertility are similar in many countries the frequency of infertility is different in many countries even among the regions of the same country; the incidence of infertility also varies depending on cultural and social differences of societies [3]. Research of infertility on man is relatively easy and based on the story, physical examination and semen analysis. Declining age of man and decreasing of fecundity associated with reduction in the frequency of sexual intercourse and cumulative accumulation in contact of peripheral toxins [4]. Story and physical examination are very important to the investigation of infertility in women. Tubo-peritoneal, ovulatory, uterine causes respectively take place among the reasons [5].

Identification of infertility at couples applying to therapy centers for having a child, determining the factors that cause infertility and planning of treatment about it is a whole. Today, many infertile couples previously incurable have the opportunity for having

children in parallel with the development of techniques for in vitro fertilization and embryo development [6].

It is aimed with this study, to determine the prevalence of infertility in the Isparta city and investigate the general demographic and epidemiological characteristics of definite infertile people.

MATERIAL AND METHODS

Research was made in Isparta city between October 2010-May 2011. There are 13 districts included central district in Isparta City. The study is prospective, cross-sectional, descriptive prevalence research carried out with face to face interview technique in these districts. Reproductive people aged 14-49 living in the Isparta city are formed the population of study.

Isparta province's population is stated as 420796 and 229956 people aged 15-49 according to the population registration system address based in 2009. However to reach this large population cannot be possible, a sample was selected as to represent and generalize the population of the study for the purposes of the study. Simple random sampling method was used for the sample selection process. Sub-group regions are formed for distributing the size of sample exact and proportional as Isparta city has a large geographic area. Sub-groups were selected as regions of family medicine in each district. Purpose of choosing the regions of family medicine as sub-group is populations of family medicine region in general are almost equal and has a proportional distribution as reflection of Isparta city. The size of sample is estimated at 3406 people with 95% confidence interval, 1% margin of error and with 10% incidence of infertility data considering 15-49 aged population in Isparta city (n:229956 people). The size of calculated sample were distributed according to the ratio 15-49 aged population in Isparta city. The number of people per capita region of family medicine was found by the calculated sizes of sample divided by the number of family medicine region arithmetically in the district concerned. The ratio of urban and rural population is looked over in each

region of family medicine. The number of people in that family medicine region was divided into the ratio of urban-rural population. A street or/and village was chosen by lot from urban and rural regions in related family medicine region. The households were determined by a simple random selection of sample according to the selected street or/and village households. The study was continued until calculated number of people were reached. If it can not be reached the specified number in selected street and/or village, study was maintained in a side street and/or village. Thus, the study provide information about all of Isparta city and represent different socio-economic levels.

People who lives households to be gone in related family medicine region during the period of study, who were volunteer to participate in research, who signed the informed consent form, who were remaining marriage at least one year and who were 15-49 aged in reproductive age were included in the study. Only one of the married couples was included in the study.

A questionnaire having 28 questions contained the sociodemographic characteristics of participants, whether kinship has between the couples, previous diseases and ongoing diseases, whether has allergy, whether had venereal disease, their information about pregnancy (to husbands information of their wives) and whether they are suitable for criteria of primary-secondary infertility is applied with face to face interview technique.

A new questionnaire consisting 34 questions to male, 42 questions to female is applied to people who are suitable for criteria of primary and secondary infertility in first questionnaire with face to face interview technique. The obtained data were evaluated.

RESULTS

1006 (29.7%) male, 2400 (70.3%) female of 3406 people are involved in the research. Gender distribution of participants according to their location are given below (table 1).

Table 1: Gender distribution of participants according to their location

		Location				Total
		Village	Town	District	City	
Gender	Male	36 (%1.1)	51 (%1.5)	428 (%12.6)	491 (%14.4)	1006 (%29.5)
	Female	212 (%6.2)	164 (%4.8)	783 (%23)	1241 (%36.5)	2400 (%70.5)
Total		248 (%7.3)	215 (%6.3)	1211 (%35.6)	1732 (%50.9)	3406 (%100)

95 people (2.8%) of 15-20 age group, 509 people (14.9%) of 21-25 age group, 568 people (16.7%) of 26-30 age group, 580 people (17%) of 31-35 age group, 553 people (16.2%) of 36-40 age group, 436 people (12.8%) of 41-45 age group and 665 people (19.5%) of

46-49 age group were determined according to age group of people in reproductive 15-49 age involved in the research.

The distribution of participants are given below according to their educational status (table 2) and

occupational group (table 3).

Table 2: The distribution of participants according to their educational

Educational status							
Illiterate	Literate	Elementry school graduate	Primary school graduate	High school graduate	Associate degree	Bachelor's degree and above graduate	Total
89	43	1576	393	721	167	417	3406
%2.6	%1.3	%46.3	%11.5	%21.2	%4.9	%12.2	%100

Table 3: The distribution of participants according to their occupational groups

Occupation							
Officer	Worker	Retired	Housewife	Freelancer	Farmer	Other	Total
360	327	103	1903	367	145	201	3406
%10.6	%9.6	%3	%55.9	%10.8	%4.3	%5.9	%100

While 29 people (0.9%) of included in the study had urologic surgery, 348 people (10.2%) had obstetrics and gynecological surgery. Pregnancy and birth information of participants or their spouses (table 4) are summarized below.

242 (7.1%) of participants had or was having actively venereal disease. 34 (1%) of 242 people had gonorrhea, 14 (0.4%) of them had syphilis, 160 (4.7%) of them had hepatitis B, 34 (1%) of them had other

diseases (hepatitis C, genital herpes, chlamydia, trichomonas vaginalis, fungus, etc).

The ratio of infertility who had venereal disease is 9.1% (n:22) [the ratio of primary infertility is 4.1% (n:10) and the ratio of secondary infertility is 5% (n:12)].

The ratio of secondary infertility who had venereal disease was significantly higher (p:0.025).

Table 4: Pregnancy and birth information of participants or their spouses

	The number of pregnant	The number of live birth		The number of stillborn	The number of involuntary abortus	The number of voluntary abortus	The number of cesarean section
1	740 %21.7	821 %24.1	1	198 %5.8	376 %11	232 %6.8	404 %11.9
2	996 %29.2	1214 %35.6	2	57 %1.7	98 %2.9	79 %2.3	215 %6.3
3	682 %20	633 %18.6	3	16 %0.5	29 %0.9	32 %0.9	27 %0.8
4	371 %10.9	187 %5.5	4 and ↑	11 %0.4	14 %0.4	15 %0.4	5 %0.1
5	170 %5	58 %1.7					
6 and ↑	146 %4.7	43 %1.2					
Total	3105 %91.2	2956 %86.8		282 %8.3	517 %15.2	358 %10.5	651 %19.1

7.7% (n:262) of 3406 participants met the criteria of infertility. 170 (64.9%) of these 262 people are suitable for criteria of primary infertility, 92 (35.1%) of them are suitable for criteria of secondary infertility.

It was found that 36 (3.6%) of the 1006 (29.5%) males are infertile [the ratio of primary infertility is 2.7% (n:27), the ratio of secondary infertility is 0.9% (n:9)] and 226 (9.4%) of 2400

females are infertile [the ratio of primary infertility is 6% (n:143), the ratio of secondary infertility is 3.4% (n:83)]. The ratio of females infertility is higher than the ratio of males infertility and was found statistically significant (p:0.000).

Infertility ratios of age groups in the study were found as 15-20 years 3.2% (n:3), 21-25 years 7.3% (n:37), 26-30 years 10.4% (n:59), 31-35 years %

10.9 (n:63), 36-40 years 6% (n:33), 41-45 years 6% (n:26) and 46-49 years 6.2% (n:41).

The ratio of infertility in 26-30 and 31-35 years' age group was statistically significant higher than other groups. (p:0.020, p:0.032, p:0.002, p:0.004, p:0.001).

The distribution of 262 infertile people according to their age groups is like this; 3 people (1.1%) in 15-20 age groups, 37 people (14.1%) in 21-25 age groups, 59 people (22.5%) in 26-30 age groups, 63 people (24%) in 31-35 age groups, 33 people (12.6%) in 36-40 age groups, 26 people (9.9%) in 41-45 age groups and 41 people (15.6%) in 46-49 age groups.

30.5% (n:80) of the infertile people in the study was smoking and 10.7% (n:28) of them was drinking. Secondary infertility was seen significantly more often among the people used alcohol than non-users. (p:0.001). Infertile people in the study declared that they wanted to have children average 7.2 ± 2.2 years (min:1-max:31) Infertile people included in the study had sexual intercourse monthly average of 8.3 ± 3.5 times (min:2-max: 30) according to their own statements.

9.9% (n:26) of infertile participants applied to nonmedical ways (going to hodja, etc.) for treatment, 7.6% (n:20) of them had used drugs except for their doctor's. Using drugs except for their doctor's was significantly higher in women (p:0.028).

The first menstrual age of the females in the study is average 13.5 ± 1.3 years (min:11-max:17), 70.1% (n:157) of them menstruate regularly average in 29.9 ± 11.2 days and menstrual bleeding continued average of 5.5 ± 1.9 days. 33 (14.7%) of 224 infertile women stated having less menstrual bleeding, 147 (65.6%) of them having normal menstrual bleeding and 44 (19.6%) of them having a large amount of menstrual bleeding, and 21 (9.4%) of them stated having metroraji.

The ratio of primary infertility was higher among the infertile women having normal amount of menstrual bleeding and the ratio of secondary infertility was significantly higher (p:0.029, p:0.008). The ratio of secondary infertility is higher the ones having metroraji (p:0.036). The higher the amount of menstrual bleeding, the higher metroraji among the women in the study (p:0.000).

135 (60.3%) of the infertile women stated having abdominal pain, 105 (46.9%) of them having changes in emotion, 116 (51.8%) of them having abdominal distention and 115 (51.3%) of them having breast tenderness in the premenstrual and menstrual period.

The ratio of primary infertility was significantly higher among the ones having abdominal pain and tenderness in the chest in the period of premenstrual and menstrual (p:0.005, p:0.039).

DISCUSSION

Having a child is important in all societies. Childlessness is traditionally a source of pain, worry and embarrassment for a couple. Today, the childless couples are considered as the family, but in most cultures, this concept haven't placed yet [1].

When the distribution of respondents by gender is examined, 29.7% of them is male, 70.3% of them is female. In the literature it is reported that despite the woman's fertility period is between the ages of 15-49, the most appropriate child-bearing age is 20-34 ages from biopsychosocial aspect [7]. 17.7% of the study group consist of 15-25 age group, 33.7% of them is 26-35 age group, 48.5% of them is over 35 years as with literature.

Level of education is important for reproduction and health behaviors, and it also affects the perception of infertility and having the problems due to the infertility [8]. In the literature, infertile couples were found mostly primary school graduates in both sexes in the study by Gurbuz similar with this study [9]. In another study by Taşçı and his colleagues, it is stated that 3% of infertile women are not literate, 4% of them are literate/elementary school level, 40% of them are in primary-high school level, 18% of them have college-faculty level education [10]. Study findings in terms of level of education are quite similar to the study findings of Gürbüz and Taşçı.

In our study it was stated that generally 94.2% of men and 14.8% of women were working. 8.3% of the men and 83.7% of the women were not working among infertile people. It was stated that 68% of the infertile women weren't working in the study by Tasci and colleagues [10]. It was stated that the vast majority of women are housewife in studies by Oguz, Kavlak, Saruhan and Terzioğlu in parallel with our results [11,12,13]. This condition is associated with the operational status of the general population.

Whether the participants have venereal disease is questioned with thinking of association with infertility. It was stated that the ratio of gonorrhoea is 1%, syphilis 0.4% in our study. The reason of low rates is stated that in most cases venereal diseases transmitted by asymptomatic, and in this respect the knowledge of our people have been low.

When pregnancy and birth information of the participants or their spouses is examined, it was stated that the average of the total number of pregnancies is 2.4, the average number of live births is 1.9. The average number of live births was 2.16 [14] according

to the results of Turkey Population Census Surveys (DHS) 2008. It was stated that the average total number of pregnancies was 2.33, while the average number of live births was 2 in the study of Albayrak in Kayseri [15]. As seen in all three studies, similar data were obtained. While the mean number of abortions were found 0.16 in the study of Albayrak [15], the average number of abortions was found 0.17 in our study.

Infertility is one of the most common problems encountered in the world. Infertility is a problem about 15% of men and women in reproductive age, varying the frequencies and causes of it from region to region [16]. The ratio of women having no children was found as 8.5% in 15-49 age group according to the result of 1990 census in our country [17]. According to DHS 2008, the ratio of women having no birth and stating their unable to birth has been identified as 9% [14].

Alternative medicine is one of the treatment methods interested in all over the world and preferred certain proportions for their disorders. Infertile people in research applied non-medical alternative methods at the rate of 9.9% and used non-medical drugs at the rate of 7.6% according to his own statements. It was stated that 57 (38.0%) of women and 32 (21.3%) of men used with traditional medicine in the study of Albayrak and his colleagues [14]. The effect of cultural structure and habits of society and status in differences of effective public health services is effective in choosing these methods.

9.4% of the infertile women in the study stated that they have metroraji in their menstrual period and the rate of secondary infertility was higher among these infertile women. In terms of literature, It was stated that that among the causes of female infertility, ovulation disorders are usually in the first place and a regular menstrual 21-35 days and the findings such as breast tenderness, pain of ovulation in the premenstrual period are considered as the sign of ovulation. At the same time, It was stated that some of gynecological disorders which can cause infertility such as polycystic ovary syndrome, endometriosis, fibroids may also cause pain [18].

Coitus at least 4 times a week was suggested to couples wishing to have child. The most common causes of infertility is having no often enough coitus [8]. In our study, infertile people have sexual intercourse at the average of 8.3 times in a month. Some lubricants have features of spermicides and when used as lubrication, this prevents pregnancy [1]. In our study, 15 (5.7%) of infertile individuals used a lubricant before sexual intercourse. For our population, the minority in frequency of sexual intercourse and having the use of lubricant were evaluated as effective factors in infertility.

It is known that mumps, orchitis, postpartum and postabortal infections can reduce fertility [1]. The ratio of infertility is higher among the people recovering from mumps and urinary tract infection in the study with similar results.

CONCLUSION

Infertility is a major problem involving a large part of society. In the study the efficient factors of the emergence of infertility are examined with the literature; it is concluded that several factors need to be the biopsychosocial approach prevail in this matter.

REFERENCES

1. TC; Sağlık Bakanlığı Ana Çocuk Sağlığı ve Aile Planlaması Genel Müdürlüğü; Ulusal Aile Planlaması Hizmet Rehberi. Sağlık Bakanlığı, Ankara, 2005; 205-206.
2. WHO; Infertility; A Tabulation of Available Data on Prevalence of Primary and Secondary Infertility. WHO, Geneva, 1991;7-19.
3. Domar AD, Clapp D, Slawsby EA, Kessel B, Orav J; Impact of group psychological interventions on pregnancy rates in infertile women. *Fertil Steril*, 2000; 86:805-811.
4. Yıkılkan H, Dilbaz B, Kestel Z; Aile Planlaması polikliniğine yasal tahliye istemiyle başvuran hastaların değerlendirilmesi. *Smyrna Tıp Dergisi*, 2012; 2(2):10-14.
5. Sushanek E, Simunic V, Juretic D, Grizelj V; Follicular fluid contents of hyaluronic acid, follicle stimulating hormone and steroids relative to the success of in vitro fertilization of human oocytes. *Fertil Steril.*, 1994; 62:347-352.
6. Healy DL, Trounson AO, Andersen AN; Female Infertility, Causes and Treatment. *Lancet*, 1994; 343(8912):1529-1544.
7. Ak G; İnfertil Çiftlerin Depresyon Durumları ve Başa Çıkma Yollarının İncelenmesi. Dokuz Eylül Üniversitesi, İzmir, 2001.
8. Taşkın L; Doğum ve Kadın Sağlığı Hemşireliği. Sistem Ofset Matbaacılık, Ankara, 2005.
9. Gürbüz ŞK; İnfertil Çiftlerde Evlilik Uyumu ve Depresif Durumun İn Vitro Fertilizasyon-Embriyo Transferi (IVF-ET) Sonuçlarına Etkisi. Marmara Üniversitesi Sağlık Bilimleri Enstitüsü, İstanbul, 2007.
10. Taşçı E, Bolsoy N, Kavlak O, Yücesoy F; İnfertil kadınlarda evlilik uyumu. *Türk Jinekoloji ve Obstetrik Derneği Dergisi*, 2008; 5(2):105-110.
11. Oğuz HD; İnfertilite Tedavisi Gören Kadınlarda infertilitenin Ruh Sağlığına, Evlilik ilişkileri ve Cinsel Yaşama Etkileri. TC Sağlık Bakanlığı Bakırköy Prof. Dr. Mahzar Osman Ruh Sağlığı ve Sinir Hastalıkları Eğitim ve Araştırma Hastanesi, İstanbul, 2004.
12. Terzioğlu F; Yardımcı Üreme Tekniklerine Başvuran Çiftlerin Danışmanlık Gereksinimlerinin Belirlenmesi ve Hemşirenin Danışmanlık

- Hizmetinin Etkinliđinin İncelenmesi. Hacettepe Üniversitesi, Ankara, 1998.
13. Kavlak O, Saruhan A; İnfertil Kadınlarda Yalnızlık Durumu ve Bunu Etkileyen Faktörlerin İncelenmesi. Ege Tıp Dergisi, 2002; 41(4):229-232.
 14. Hacettepe Üniversitesi Nüfus Etutleri Enstitüsü; Türkiye Nüfus ve Sağlık Araştırması 2008. Hacettepe Üniversitesi Hastaneleri Basımevi, Ankara, 2009.
 15. Albayrak E, Günay O; State and trait anxiety levels of childless women in Kayseri, Turkey. Eur J Contracept Reprod Health Care, 2007; 14:1-6.
 16. Aktürk FS; Türk Toplumunun Yardımcı Üreme Tekniklerine Bakışı. Afyon Kocatepe Üniversitesi, Afyon, 2006.
 17. Türkiye İstatistik Kurumu 2009 verileri. Available from www.tuik.gov.tr
 18. Yıldırım M; Klinik Jinekoloji. 2. edition, Eryılmaz Ofset, Ankara, 2002; 65-92.