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An investigation of the underlying causes and distribution of male infertility in South of Iran-Bandar Abbas: a cross-sectional study.

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Abstract

Background: Male infertility accounts for a main portion of mortalities among couples and not only has economic and social consequences but it also induces psychological and consequently social problems in families. Male infertility is on a rising trend as an idiopathic disorder. A number of relevant cofactors of life-style such as obesity, smoking, illegal drugs, temperature, etc. can affect the male reproductive system.

Materials and methods: A total number of 300 infertile patients participated in the present research. To describe the data, indices of central tendency and distribution were used and explore the correlation among the variables, the chi-squared test was run as well as Pearson's correlation coefficient and t-test. The significance level of the data was considered as $p<0.05$.

Results: The results revealed a statistically significant effect of smoking and varicocele on infertility ($p<0.05$). Among the occupations explored, holding an official post showed to be mostly associated with infertility and disorders in sperm parameters. However, the correlation between these variables was not statistically significant. The rate of infertility showed to be higher in men of higher BMI.

Conclusion and recommendations: The present research aimed to evaluate the effect of contextual factors on male infertility. The results confirmed that among infertile men, fertility can be tremendously affected by their life style.

Keywords: Male infertility, Factors, Life style.

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Introduction

As defined by the World Health Organization (WHO), infertility is defined as a state when a couple stands no chance of fertility after 12 months of unprotected intercourse [1]. Statistics show the rate of infertility in the USA to range from 12 to 15 percent on average [2,3]. However, in Iran, the same rate is 13.2; the total frequencies of primary and secondary infertility are respectively 5.2 and 3.2 percent [4]. It is estimated that about 72.4 million of couples worldwide experience either primary or secondary infertility [5]. A variety of factors can account for the occurrence of infertility. Among them are female age, increased rate of sexually transmitted infections, increased rate of exposure to environmental toxins and lifestyle factors such as obesity and smoking. In an overall evaluation of infertility, three factors are to be taken into account: oval factors, anatomic disorders and pelvic functioning, and finally malefactors [6]. Infertility afflicts 15% of the sexually active population and 50% of the cases with a malefactor [7]. There are many cases considered as the risk factors of male infertility including varicocele, male gland infection, systematic diseases such as diabetes, occupational as well as ecological factors [8,9]. Diagnosing the factors involved in sperm functioning truly affects male infertility. Nevertheless, some of these factors are included in a standardized sperm analysis. These all show that routine sperm analyses alone are incapable of providing the required information for a full diagnosis of the causes of infertility. Therefore, determining the different causes of infertility plays a key role in a better diagnosis and a more effective treatment [10-12]. Infertility patterns in countries developing with developed countries is completely different and incident preventive infertility in a developing country is very much, and this is largely due to a lack of proper definition of male infertility and awareness of the underlying causes in these geographic domains [13,14]. There is a need for a full evaluation of malefactors, the detailed family background of risk factors including fertility problems, physical tests and lab tests. This is largely due to the fact that most medications today negatively affect male infertility. Some evaluations need to be done in a patient analytic framework on several drugs and medications patients take but can adversely affect fertility [15].

Besides high costs, infertility can lead to confusion, disappointment, depression, anxiety, feeling of guilt and lacking values in life [16].

The present research sought to provide primary information on the underlying factors of infertility among the male visitors of infertility and IVF centers in Bandar Abbas. It aimed to see how infertility was related to a number of factors such as occupational background, contextual factors and the primary causes of infertility.

Materials and Methods

The present descriptive/analytical research was cross-sectional in type. Its population was comprised of all the men visiting the infertility/IVF centers in Bandar Abbas. The required information was derived from patients' medical records available in the medical centers (including Om-e-Leila IVF and infertility center). Those whose duration of infertility was less than a year were excluded from the study. The variables addressed in the present research were the cause of infertility, age, duration of infertility, type of infertility, smoking, alcohol consumption, varicocele and BMI. The cause of infertility in each case was diagnosed and declared by an urologist. The other relevant information was obtained from the patient's medical record.

Statistical analysis

Once the data were extracted and the relevant forms were filled out, the data were analysed statistically *via* SPSS. To describe the data, indices of central tendency and distribution were used. To explore the correlation between variables, chi-squared test, Pearson's correlation coefficient and t-test were run ($p<0.05$).

Results

The data belonged to 300 infertile men whose average age was 28.24 ± 4.74 years (min=18, max=45) (Table 1). The duration of infertility in month was 68.09 ± 57.51 on average (min=13, max=324). In this study, 124 subjects (41.3%) of infertile men suffered from the primary causes of infertility while 176 (58.7%) were diagnosed with the secondary causes. 151 (50.3%) had no varicocele; 83 subjects (27.6%) were diagnosed with the first grade varicococele; 29 subjects (9.7%) with the third-grade varicocele. In the seminal fluid analysis, 18 patients (6%) were diagnosed with azoosperima, 66 patients (22%) with oligozoospermia and 21 (7%) with asthenospermia. Overall, occupationally speaking, 92 subjects (30.7%) had official sedentary jobs; 51 patients (17%) were workers; 46 (15.3%) worked freelance; 30 (10%) were teachers; 26 (8.7%) were farmers and the rest held other occupations. Among these occupations, official workers and those working freelance suffered from the majority of sperm problems though not statistically significant (p=0.430). Asthenospermia and oligozoospermia were the most frequent among those holding official jobs. The difference was statistically significant (p=0.130). Those working freelance, workers, teachers and farmers respectively ranked next in terms of the frequency of asthenospermia (Table 2).

Table 1. *Relative frequency and percentage of infertile subjects' demographic information.*

Variable	f.	%
Age		
<25 years	101	33.7
26-30 years	111	37
31-40 years	85	28.3
>40 years	3	1
Infertility duration		
<2 years	55	18.3
2-5 years	205	68.3
6-10 years	36	12
>10 years	4	1.3
Infertility type		
Primary	124	41.3
secondary	176	58.7
BMI		
Slim	7	2.3
Average-weight	126	42
Overweight	118	39.3
obese	49	16.3

Significant correlations were found between the duration of infertility and smoking as well as the duration of infertility and varicocele ($p<0.916$).

In this research, from among 300 patients, only 29 consumed alcohol. No statistically significant correlation was found between alcohol consumption and parameters ($p<0.232$).

Table 2. *Significant correlation between sperm disorders and age, occupation, varicocele, smoking and alcohol.*

f.	216	18	66	300
%	72	6	22	100
Age				
<25 years	73	8	20	101 (33.3%)
26-30 years	82	3	25	110 (36.6%)
31-40 years	59	6	20	85 (28.3%)
>40 years	1	1	2	4 (1.8%)
p-value	1.01	0.845	0.496	--
Occupation				
Official job	67	4	20	91 (30.3%)

Freelance	32	1	13	46 (15.3%)
Military	16	1	8	25 (8.3%)
Teacher	22	4	4	30 (10%)
University student	8	1	3	12 (4%)
Ship building	11	1	3	15 (5%)
Worker	39	2	10	51 (17%)
Farmer	19	4	3	26 (8.8%)
Other	1	0	3	4 (1.3%)
p-value	0.43	0.755	0.13	--
Varicocele (n=149, 49.7%)				
Grade 1	61	5	17	83 (27.6%)
Grade 2	28	1	9	38 (12.6%)
Grade 3	13	7	8	28 (9.3%)
p-value	0.05	0.025	0.002	--
Smoking (n=81, 27%)				
Smoker	60	3	18	81 (27%)
p-value	0.05	1.02	0.685	--
Alcohol (n=29, 9.7%)				
consumer	19	2	8	29 (9.7%)
p-value	0.251	0.489	0.536	--

Discussion

Finding out the underlying causes of male infertility is challenging. This is due to the heterogeneity, complexity and defective knowledge of the causes. Moreover, it has been recently suggested by WHO that changes in semen analysed lower than the permitted limits can lead to infertility [17]. That is why exploring the cofactors of infertility is far from easy but necessary to control and prevent infertility. According to a body of related research, alcohol abuse can damage testosterone production and oval analysis. Besides alcohol, smoking can also affect sperm parameters and fertility [18,19]. Varicocele is diagnosable in about 43% of male adults and prevails among 35% of men with primary infertility and 80% of those with secondary infertility. Moreover, BMI and occurrence of varicocele showed to be negatively correlated [20].

The present research sought to explore the prevalence of male infertility among the male population in Hormozgan, the south of Iran. In this study, 300 men visiting infertility centers were evaluated. As the prevalence of infertility varies to a great extent worldwide, Iran is not an exception. As a body of related research shows, the overall rate of infertility has been 13.2% in Iran [21]. However, the prevalence varies across countries. In Yazd, Tehran and Isfahan (primary infertility), these rates are respectively 5.5%, 12% and 2.3% [22-24]. The prevalence of male infertility showed to be 23% in the present research (CI=95%). The related literature, in a similar fashion, evaluated the cofactors of male infertility from two aspects, contextual factors and genetic background. Nevertheless, a number of contextual and geographic conditions have attracted considerable attention recently. Temperature and exposure to contextual factors directly affect infertility. It is suggested that occupations severely exposed to direct heat might enjoy a better quality of sperm and overall fertility as compared to those in better occupational conditions. The role of BMI in relation to male infertility was also evaluated in the present research. Those with BMI>25 (the obese) showed to be significantly oligozospermic and asthenospermic ($p<0.01$). A body of the related literature showed that about 30% of infertile men in an extensive research had a BMI ranging from 26 to 28 [25]. On the other hand, it was shown in the present study that the obese suffered a higher risk of infertility.

Instructions can be provided for infertile patients to raise their awareness of the consequences of consuming certain drugs besides weight control can affect fertility at least partly.

The present study evaluated the effect of contextual factors on male infertility. Therefore, further research is required to help cut down on the contextual factors affecting sperm parameters. More illuminating results can be obtained from more extensive research.

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Availability of Data and Materials

Please contact author for data requests.

Authors' Contributions

In this study, MK has been involved in data collection and consultation with patients. Data analysis was performed by MK and SF. AZ and MJH contributed to the final design of the paper. The final version of the article after the writing was approved by all the authors.

Ethics Approval and Consent to Participate

This study was approved by the Ethical Committee of Hormozgan University of Medical Sciences.

Consent for Publication

Not applicable

Competing Interests

The authors declare that they have no competing interests.

References

1. Zegers-Hochschild F, Adamson GD, de Mouzon J, Ishihara O, Mansour R, Nygren K, Sullivan E, Van der Poel S. The international committee for monitoring assisted reproductive technology (ICMART) and the world health organization (WHO) revised glossary on ART terminology, 2009. Human Reprod 2009; 24: 2683-2687.
2. Louis JF, Thoma ME, Sørensen DN, McLain AC, King RB, Sundaram R. The prevalence of couple infertility in the United States from a male perspective: evidence from a nationally representative sample. Andrology 2013; 1: 741-748.
3. Thoma ME, McLain AC, Louis JF, King RB, Trumble AC, Sundaram R. Prevalence of infertility in the United States as estimated by the current duration approach and a traditional constructed approach. Fertil Steril 2013; 99: 1324-1331.
4. Direkvand Moghadam A, Delpisheh A, Sayehmiri K. The prevalence of infertility in Iran, a systematic review. Iran J Obstetr Gynecol Infertil 2013; 16: 1-7.
5. Boivin J, Bunting L, Collins JA, Nygren KG. International estimates of infertility prevalence and treatment-seeking: potential need and demand for infertility medical care. Hum Reprod 2007; 22: 1506-1512.
6. Speroff L, Fritz MA. Clinical gynecologic endocrinology and infertility. Lippincott Williams Wilkins 2005.
7. Pasqualotto FF, Lucon AM, Sobreiro BP, Pasqualotto EB, Arap S. Effects of medical therapy, alcohol, smoking, and endocrine disruptors on male infertility. Rev Hosp Clínicas 2004; 59: 375-382.
8. Irvine DS. Epidemiology and aetiology of male infertility. Hum Reprod 1998; 13: 33-44.
9. Muhammad H, Shah AA, Nabi G, Farooqi N. Male infertility: etiological factors-a review. Am-Eurasian J Toxicol Sci 2015; 7: 95-103.
10. Agarwal A, Mulgund A, Hamada A, Chyatte MR. A unique view on male infertility around the globe. Reprod Biol Endocrinol 2015; 13: 37.
11. Monoski M, Nudell DM, Lipshultz LI. Effects of medical therapy, alcohol, and smoking on male fertility.(CME Article). Contemp Urol 2002; 14: 57-64.
12. Nandi A, Homburg R. Unexplained subfertility: diagnosis and management. Obstet Gynaecol 2016; 18: 107-115.
13. Agarwal A, Mulgund A, Hamada A, Chyatte MR. A unique view on male infertility around the globe. Reprod Biol Endocrinol 2015; 13: 37.
14. Mohebbi SF, Ali Mohammadzadeh K. Systematic review of the etiology of the infertility on Iranian domestic published articles between 1999 and 2013. Med Sci J Islam Azad Univesity-Tehran Med Branch 2016; 26: 1-15.
15. Hasanpoor-Azghdy SB, Simbar M, Vedadhir A. The emotional-psychological consequences of infertility among infertile women seeking treatment: results of a qualitative study. Iran J Reprod Med 2014; 12: 131.
16. Nasseri M. Psychological and social aspects of infertility and infertility treatment: the Persian experience (Doctoral dissertation, Middlesex University). Middlesex University Research Repository 2000.
17. Telöken C, Juncal S, Graziottin TM. Environmental factors. Male infertility. Springer 2012; 283-295.
18. Gaur DS, Talekar MS, Pathak VP. Alcohol intake and cigarette smoking: impact of two major lifestyle factors on male fertility. Indian J Pathol Microbiol 2010; 53: 35.
19. Maneesh M, Dutta S, Chakrabarti A, Vasudevan DM. Alcohol abuse-duration dependent decrease in plasma testosterone and antioxidants in males. Ind J Physiol Pharmacol 2006; 50: 291.
20. Parekattil SJ, Agarwal A, editors. Male infertility: contemporary clinical approaches, andrology, ART and antioxidants. Springer Science Business Media 2012.
21. Direkvand Moghadam A, Delpisheh A, Sayehmiri K. The prevalence of infertility in Iran, a systematic review. Iran J Obstet Gynecol Infertil 2013; 16: 1-7.
22. Aflatoonian A, Seyedhassani SM, Tabibnejad N. The epidemiological and etiological aspects of infertility in Yazd province of Iran. Int J Reprod Biomed 2009; 7: 117-122.
23. Nojomi M, Ashrafi M, Koohpayehzadeh J. Study of couples infertility in the west of Tehran, in the year of 2000. Razi J Med Sci 2002; 8: 633-639.
24. Hosseini J, Emadedin M, Mokhtarpour H, Sorani M. Prevalence of primary and secondary infertility in four selected provinces in Iran, 2010-2011. Iran J Obstet Gynecol Infertil 2012; 15: 1-7.
25. Sallmén M, Sandler DP, Hoppin JA, Blair A, Baird DD. Reduced fertility among overweight and obese men. Epidemiology 2006; 17: 520-523.

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