

Prevalence of Varicocele among Primary and Secondary Infertile Men: Association with Occupation, Smoking and Drinking Alcohol

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Abstract

Background: Existing data suggests that varicocele plays a central role in progressive infertility. **Aims:** This study was designed to assess the occupational and lifestyle factors of development of varicocele among male infertile, for a better prevention and management of the varicocele. **Materials and Methods:** All males with infertility, who presented at Fatemehzahra Infertility and Reproductive Health Research Center between April 2010 and February 2011, were examined. Their occupations, smoking, and drinking alcohol, presence or absence of varicocele were evaluated. The lifestyle factors associated with varicocele were analyzed. **Results:** The data of 816 men, aged 21-71 years, were included in the study. Two hundred and sixty-one men (32%) with varicocele and 555 (68%) without varicocele were found. Percentage of varicocele was significantly higher in smokers compared with non-smokers ($P = 0.035$). The adjusted OR for varicocele in smokers was significantly higher than that in non-smoker (OR = 2.420; 95% CI = 1.04, 5.61). No significant differences were seen between varicocele and occupation or alcohol drinking for the prevalence of varicocele. **Conclusions:** The findings of the present study indicated that a high frequency of varicocele was identified among male infertile. Therefore, it is necessary for those male cigarette-smokers to evaluate their possibilities of infertility and varicocele.

Keywords: Alcohol drinking, Infertility, Male, Occupations, Smoking, Varicocele

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Introduction

Varicocele is a condition involving spermatogenesis and a major cause of male infertility.^[1] Prevalence of varicocele is varied considerably between general population and infertile men.^[2,3] It is important to note that not all men who have varicocele are infertile, but varicocele is more common in the men attending the infertility clinics.^[4,5] In addition, varicocele is more frequent in man with primary infertile than with secondary infertility.^[6] The pathogenesis and etiology of varicocele is multifactorial.^[7]

A number of studies discussed the relationships between anthropometric parameters and varicocele.^[7-9] Some literatures have emphasized that occupational exposure, cigarette smoking and drinking are associated with infertility,^[10-16] while other studies have excluded these associations with infertility.^[17,18] Some of lifestyle factors may be linked to varicocele in infertile men, such as smoking, alcohol consumption, and occupational exposure, these are associated with varicocele and increase the risk of infertility.^[19] Therefore, further research is needed in order to elucidate the associations of smoking, occupation, and drinking with development of varicocele in male infertile.

Materials and Methods

The research design of this study was a retrospective cross-section. The study was based on secondary data from the Infertility and Reproductive Health Center. Inclusion criteria for the study were men

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with infertility who presented to our center between April 2010 and February 2011. A total of 816 patients were selected and reviewed based on inclusion criteria. Demographic data, including age, education level, residence, occupation, type of infertility, age at marriage, duration of infertility and data about smoking habits and alcohol consumption was summarized in Table 1.

All subjects were classified as presence or absence of varicocele. Varicocele was diagnosed in the center during physical examination in the upright position, and confirmed using the scrotal ultrasonography.

The Ethical Committee of Medical Faculty of Babol University of Medical Sciences approved the study. Informed consent was obtained from all subjects.

Statistical analysis

SPSS software version 16.0 (SPSS Inc, Chicago, USA) was used for statistical analyses. Descriptive statistics were used to describe baseline demographic. The final multivariate model that included varicocele as dependent variables were related to the outcome ($P = 0.2$ in bivariate analyses). Adjusted regression analysis was used to test associations between categorical occupations, smoking, and drinking with varicocele. All independent variables that met the above criteria were included in the

multiple logistic regression. A P -value less than 0.05 was significantly considered.

Results

A total of 816 infertile men were referred to the center. 74.6% of the patients had primary infertility and 25.4% secondary infertility. The overall prevalence of varicocele accounted for 32.0% (CI 95%; 28.1, 36.0) among the infertile men. Moreover, varicocele accounted for 32.2% (CI 95%, 29.3, 37.1) of patients with primary infertile, and 28.5% (CI 95%; 26.5; 30.5) with secondary infertile. No significant differences were seen between the type of infertility and varicocele.

The mean age was 31.6 ± 6.4 years old (21-71 years). The mean age in the group with varicocele (30.9-years old) was significantly younger than that without varicocele (31.9-years old) ($P = 0.019$). The mean age at current marriage was 25.6 ± 4.9 for varicocele and 26.4 ± 5.7 for non-varicocele, there was a significant difference between them ($P = 0.02$). The mean body mass index (BMI) and infertility duration had no significant difference in those with or without varicocele. 61.3% of male infertile was urban residence. There was no significant relations between varicocele prevalence and resident location. Overall, male with varicocele was more frequently current smokers than

Table 1: Characteristics of male infertile in groups with and without varicocele

Variables	Total ($n = 816$) mean \pm SD	Varicocele ($n = 555$) mean \pm SD	non-varicocele ($n = 261$) mean \pm SD	P-value
Age (years)	31.6 \pm 6.4	31.9 \pm 6.7	30.9 \pm 5.6	0.019
Age at current marriage (years)	26.2 \pm 5.2	26.4 \pm 5.7	25.6 \pm 4.0	0.020
BMI (kg/m)	28.0 \pm 4.8	28.3 \pm 4.8	27.4 \pm 4.8	0.110
Infertility duration	4.0 \pm 3.7	4.0 \pm 3.8	4.0 \pm 3.5	0.920
Infertility Type	N (%)	N (%)	N (%)	0.214
Primary	609 (74.6)	407 (73.3)	202 (77.4)	
Secondary	207 (25.4)	148 (26.7)	59 (22.6)	
Education (years)				0.124
<6	108 (13.2)	82 (14.8)	26 (10.0)	
6-12	560 (68.6)	378 (68.1)	182 (69.7)	
>12	148 (18.1)	95 (17.1)	53 (20.3)	
Residency				0.886
Urban	500 (61.3)	341 (61.4)	159 (60.9)	
Rural	316 (38.7)	102 (39.1)	214 (38.6)	
Occupations				
Office employees	148 (18.1)	98 (17.7)	50 (19.2)	
Industrial/construction workers	303 (37.1)	290 (36.0)	103 (39.5)	
Drivers	107 (13.1)	78 (14.1)	29 (11.1)	
Farmers	52 (6.4)	33 (5.9)	19 (7.3)	
Business	206 (25.2)	146 (26.3)	60 (23.0)	
Cigarette smoking	23 (2.8)	11 (2.0)	12 (4.6)	0.035
Alcohol consumption	57 (7.0)	39 (7.0)	18 (6.9)	0.946

BMI = Body mass index

those without varicocele. Chi-square test showed no significant difference between the alcohol drinking and varicocele. More than 68% of male infertile had an elementary educational level. Chi-square test showed no significant relation between the varicocele group and education level.

Table 2 presents the estimated adjusted odds ratio (with 95% CI) for varicocele in relation of occupation, smoking habits, and drinking alcohol in male infertile. The adjusted OR in smokers was higher than those in the non-cigarette-smoking individuals (OR = 2.42, 95% CI = 1.04, 5.61). In No significant association was seen between the occupation and drinking alcohol in those with varicocele and without varicocele.

Discussion

Most of the studies have showed a higher prevalence of primary infertility compared with secondary infertility.^[6,20] However, men with the secondary infertile have an opportunity for future fertility, because varicocele is more frequently common in secondary infertile men.^[21,22] In this study, approximately 75% of infertile men had primary infertility and over 25% had secondary infertility; around 32% of infertile men had varicocele. However, Nielson reported 15%-20% of men with infertility had varicocele.^[8] A possible explanation for relatively higher prevalence of varicocele in infertile men in our study may be due to the various somatometrics parametric and environmental factors.^[23] In addition, those individuals with mild varicocele should not be missed in physical examination.

Table 2: Adjusted ratio (OR) for varicocele according to occupation, smoking habits, and drinking of the subject (n = 816)

Variables	Adjusted OR*	95% Confidence interval	P
Occupation			
Office employees	0.602	0.29, 1.25	0.172
Industrial/ construction workers	0.609	0.33, 1.14	0.119
Drivers	0.470	0.22,1.02	0.056
Farmers	0.491	0.19, 1.30	0.153
Business	1.00		
Cigarette smoking			
Yes	2.420	1 ,043, 5.613	0.040
Never	1.00		
Alcohol drinking			
Yes	1.003	0.56, 1.80	0.991
Never	1.00		

*Adjusted for confounder were for age, occupation, drinking, smoking and residency

Despite a large number of researches regarding the effect of smoking on male infertility, the relationship between varicocele and smoking is still in debate.^[19,24-26] It is suggested that smoking may have a greater adverse influence on the varicocele.^[27] In the present study, we also found that smoking increased the risk of varicocele. Cigarette smoking increase an accumulation of cadmium in testes, and may cause testicular damage in men with varicocele.^[28,29] Men with varicocele seem more frequently to suffer from infertility than the men without varicocele. A large size of prospective study is, therefore, needed in order to clarify the importance of smoking in relation to varicocele risk factors among infertile men.

Some recent studies, which focused on the impact of occupation and alcohol on infertility, showed that alcohol intake and occupational factors influenced the reproductive system.^[30,31] A number of findings have demonstrated the relationship between occupation and risk of infertility.^[10] Industrial and construction workers or agriculture worker may have an increased prevalent of infertility.^[32,33] Although the role of alcohol intake and occupation on varicocele is unclear, our results do not support the hypothesis that the alcohol intake and occupational factors such as industrial and agriculture workers is closely related to varicocele in infertile men. Therefore, a further prospective study is proposed to elucidate the association of alcohol and occupation with varicocele risk factor in male infertile.

Limitations

The present study examined a convenience sample, the studies in the future should use population-based random sample, which may provide stronger evidence with the associations between varicocele and infertility. In addition, the unavailability of some information, such as exact nature of men occupation, and amount of drinking and smoking caused an decrease in the number of variables in our present study. Finally, this study did not assess the causality, whereas a case-control study could represent more appropriate in assessing the causes or risk factor associated with varicocele.

Conclusions

Varicocele alone constituted for 32.0% of infertile men, and was associated with smoking. This percentage was nearly comparable with the findings from other studies. Despite the limitation, the prospective study demonstrated a strong association between infertile and varicocele. Therefore, further studies are needed to make a recommendation or guideline for a better prevention and management of varicocele.

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