

Original Article

Comparison of Somatometric Indices in Patients with Grade III Varicocele with Non-Varicocele Patients

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HIGHLIGHTS

- Patients with grade III varicocele have a significantly longer penis length.
- Patients with grade III varicocele have a higher incidence of gynecomastia than those without this disease.
- Patients with grade III varicocele are significantly taller than people not suffering from this disease.

ARTICLE INFO

Receive Date: 01 April 2023

Accept Date: 20 June 2023

Available online: 22 June 2023

DOI: [10.22034/TRU.2023.402743.1148](https://doi.org/10.22034/TRU.2023.402743.1148)

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ABSTRACT

Introduction

Varicocele is defined as dilated and tortuous veins in the pampiniform network. This study aims to compare somatometric indices in patients with grade III varicocele with non-varicocele patients.

Methods

This case-control study was conducted on patients referred to the Urology Department and Clinic of Razi Medical Education Center in Rasht. The subjects of the case group were patients with grade III varicocele. The control group was other patients referred to the clinic and urology department, in whom varicocele was not diagnosed. All subjects were evaluated in terms of gynecomastia, BMI, height, weight, penis length, waist circumference (WC), waist-to-hip ratio (WHR), as well as varicose leg disease and inguinal hernia and its relationship with grade III varicocele.

Results

In this study, 192 patients were compared in two groups of patients with grade III varicocele (n=96) and non-varicocele patients (n=96). There was a significant difference in the mean height between the two groups (P-value=0.001). But there was no statistically significant difference in the BMI (P-value=0.856), waist-to-hip circumference (P-value=0.117), and waist circumference (P-value=0.363) in the two studied groups. On the other hand, the average length of the penis in afflicted subjects was significantly upper (P-value=0.041) and gynecomastia was more prevalent in this group (P-value=0.008)

Conclusions

The results of the present study showed that patients with grade III varicocele are significantly taller and have significantly longer penis lengths and a higher incidence of gynecomastia than those without this disease.

Keywords: Varicocele; Penis; Gynecomastia

Introduction

Varicocele is defined as dilated and twisted veins in the pampiniform plexus and is the most common cause of infertility in men that can be corrected by surgery. In puberty, it is seen in 15% of healthy people and it is seen in up to 40% of infertile patients. The bilateral type is seen in less than 10% of healthy people, but up to 20% in infertile people (1).

Diagnosis of varicocele is based on clinical examination. In most cases, it is seen on the left side, and its cause is the longness of the left spermatic vein.

Varicocele causes atrophy of the testicle, and the atrophy is improved by correcting the varicocele (1).

The pathogenesis of varicose veins is related to factors that increase the pressure in the veins of the pampiniform network and their venous drainage. Recently, it has been suggested that one of the factors that may play a role in the pathogenesis of varicocele is obesity and BMI (2, 3), so studies have been conducted on the relationship between factors and somatometric indices with varicocele (3-6).

In previous studies, it has been concluded that obesity and increasing BMI can have a significantly reduced effect

on the prevalence of varicocele, but its relationship with grade 3 has not been investigated. Therefore, the present study aims to investigate its possible impact (2, 6). In the studies that have been conducted so far, the relevant variables have been evaluated only cross-sectionally in the community of varicocele patients. In this research, we intend to evaluate some clinical indicators such as BMI, gynecomastia, and other somatometric indicators such as height, weight, penis length, waist circumference indicators, the waist-to-hip ratio in patients with varicocele III and people not affected by varicocele are evaluated and compared, and also, as a secondary objective, the possible relationship between leg varicose and inguinal hernia and varicocele is investigated.

Methods

The present study is a case-control study that was conducted on patients referred to the Urology Department and Clinic of Razi Medical Training Center in Rasht. This study was approved by the Rasht University of Medical Sciences ethics committee (IR.GUMS. REC.1396.236). In the standing state, varicocele is divided into three grades: Grade 1: palpable with Valsalva maneuver. Grade 2: Visible with Valsalva maneuver. Grade 3: Without the Valsalva maneuver, it can be felt and seen, and the diagnosis of varicocele has been confirmed for them by a urologist.

The case group were patients with grade III varicocele, which were diagnosed based on clinical findings and examinations and the control group were other patients referred to the clinic and the urology department, in whom varicocele was not diagnosed after

the necessary examinations. Exclusion criteria included the absence of secondary sexual characteristics, history of non-descension of the testicles, history of testicular tumor, history of varicocele surgery (varicocelectomy), symptoms of genetic clinical syndromes (Kleinfeltromarfan, etc.), impotence, morbid obesity (BMI>35), short stature (height<140cm), and history of skeletal surgery or congenital skeletal abnormality.

The age of the two groups was matched by frequency matching and the control group was also selected in the same age range and the same number. All subjects were evaluated in terms of characteristics such as gynecomastia, BMI, and other somatometric indices such as height, weight, penis length, waist circumference (WC), and waist-to-hip ratio (WHR).

BMI was measured based on the ratio of weight to height using a standard scale. Varicose veins and hernias were also diagnosed based on defined clinical criteria. Gynecomastia is a benign proliferation of breast glandular tissue in men, which leads to the enlargement of one or two breasts. This is a complex process that is caused by hormonal changes in the body. Other demographic information related to patients was also entered in the data collection form.

Data Analysis

After collecting the data, the information was entered into SPSS 21 software to compare qualitative variables such as varicose veins, hernia, and gynecomastia in the two study groups using the Chi-square test, and Fisher's exact test was used if Chi-square was not valid.

To compare quantitative variables such as waist

Table 1. Comparison of the frequency of history of diseases in the two study groups

Diseases	Groups Number (Percent)		
	Grade 3 varicocele	Not suffering from varicocele	P-value
History of leg varicose veins	18(18.8)	29(30.2)	0.065
History of Inguinal hernia	27(28.1)	30(31.3)	0.636
Gynecomastia	32(33.3)	16(16.7)	0.008

Table 2. Comparison of the variables in the two studied groups

Diseases	Groups Mean \pm SD		
	Grade III varicocele	Not suffering from varicocele	P-value
Height (m)	1.8 \pm 0.08	1.75 \pm 0.1	0.001
Penis length	6.81 \pm 1.78	6.2 \pm 1.77	0.041
BMI	24.1 \pm 4.21	24.8 \pm 3.03	0.856
Waist-to-hip ratio (cm)	1.0 \pm 0.11	0.99 \pm 0.10	0.117
waist circumference (cm)	96.55 \pm 14.25	96.81 \pm 11.14	0.363

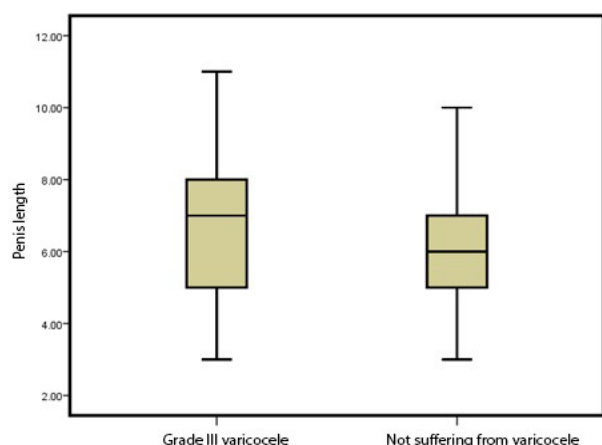


Figure 1. The average length of the penis in the two studied groups

circumference, WHR, BMI, weight, height, and penis length in two groups, the parametric Mann-Whitney test was used.

Results

In this study, 192 patients were compared in terms of somatometric variables in two groups of patients with grade III varicocele (n=96) and patients not affected by varicocele (n=96). The mean age of the participants was 28.4 ± 6.6 years.

The history of varicose veins in the group of grade III varicocele patients was 18.8% and in non-varicocele patients to 30.2%, this difference is not statistically significant (P-value=0.065). The percentage of history of inguinal hernia in the group with varicocele was 28.1% and in the group without varicocele, it was 31.3%, and this difference is not statistically significant (P-value=0.636). Also, the percentage of gynecomastia in the varicocele grade III group was 33.3%, which was about 2 times that of the non-infected group (16.7%) this difference is significant (P-value=0.008) (Table 1).

Based on Table 2, the height mean of grade III varicocele patients is 1.80 ± 0.1 , and this figure in the group not suffering from varicocele was 1.75 ± 0.1 . There are significant differences between the two groups (P-value=0.001). In terms of penis length, the mean of the varicocele grade III group is 6.81 ± 1.78 , and the control group is 6.2 ± 1.77 cm. This difference is statistically significant. (P-value=0.04, Figure 1). The BMI of the two study groups (P-value=0.856), waist-to-hip circumference (P-value=0.117), and waist circumference (P-value=0.363) were not statistically significantly different.

Discussion

The exact mechanisms of abnormal testicular function in varicocele patients are not fully understood. However, studies have shown that the prevalence of this disease is

78-93% on the left side of the testicle and 15% on the right side of the testicle (2). In the present study, some clinical indices such as BMI, gynecomastia, and other somatometric indices such as height, weight, penis length, waist circumference indices, and waist-to-hip ratio in patients with grade 3 varicocele and non-sufferers. Varicocele has been evaluated and compared, and as a secondary objective, the possible relationship between leg varicose and inguinal hernia and varicocele has been investigated.

In our research, the average height of patients with grade III varicocele was 1.80 ± 0.1 and in the group without varicocele, it was 1.75 ± 0.1 . This difference was statistically significant (P-value=0.001). The average length of the penis in the grade III varicocele group was 6.81 ± 1.78 and in the opposite group, it was 6.2 ± 1.77 , which was statistically significant (P-value=0.041). In the study of Bae and his colleagues, the average height of the group of varicocele patients was 168.53 ± 9.97 and in the non-varicocele group it was 30.83 ± 17.31 (7), which, unlike our study, this difference was not significant (P-value=0.227). On the other hand, in the study of Prabakaran and his colleagues (5), based on the results of logistic regression analysis, it was reported that penis length is one of the important factors related to varicocele (OR=1.37, P-value=0.01); This finding is also consistent with the result of the present study.

Developmental changes as a result of puberty are mentioned as important causes related to varicocele. In the study of Prabakaran and colleagues (5), the height of people had a positive correlation with the occurrence of varicocele. On the other hand, in the study of Prabakaran and his colleagues (5), it was observed that patients with varicocele have a longer penis length. Penis length is an indicator of maturity and is correlated with different stages of maturity. The authors of this study stated that the results of this study probably indicate that adolescents who go through the puberty process quickly have a higher incidence of varicocele. However, the different results reported regarding the relationship between the height of people and the size of their penis with the occurrence of varicocele in our study and other studies mentioned above reveal the need to conduct more studies in this field to obtain more accurate results.

In the present study, BMI (P-value=0.856), waist-to-hip circumference (P-value=0.117), and waist circumference (P-value=0.363) did not have statistically significant differences in the two studied groups. In the study of Bae and his colleagues (7), unlike the present study, the average BMI between the two groups of varicocele sufferers (21.66 ± 3.21 kg/m²) and non-varicocele sufferers (24.04 ± 3.64 kg/m²) had The difference was statistically significant (P-value=0.000). In the study of Doğanekin and his colleagues (8), the mean BMI between the two groups of varicocele sufferers (24.7 ± 2.5 kg/m²) and those

without varicocele ($30.5 \pm 6.4 \text{ kg/m}^2$) has a statistically significant difference. ($P\text{-value} > 0.001$) Also, in previous research (13), BMI was mentioned as one of the important factors related to varicocele ($\text{OR} = 0.87$, $P\text{-value} = 0.008$) (9). On the other hand, in the other study, the average waist circumference between patients with and without varicocele (was 81.19 ± 9.01 against $86.40 \pm 9.97 \text{ cm}$) and the average waist to hip circumference in two groups (10). The study item (0.82 ± 0.05 vs. 0.89 ± 0.05) had a statistically significant difference, and these findings were also in conflict with the findings of the present study.

Conclusions

The results of the present study showed that patients with grade III varicocele have significantly longer penis lengths and higher incidence of gynecomastia compared to people not suffering from this disease, and they are also significantly taller than people not suffering from this disease.

Authors' contributions

HN is the principal investigator and edits the manuscript, run the search and methodology and provide data, EK wrote review and editing.

Acknowledgments

Special thanks to Razi Hospital, School of Medicine, Guilan University of Medical Sciences, Guilan, Iran.

Conflict of interest

All authors declare that there is no conflict of interest.

Funding

There was no funding.

Ethics statement

This study was approved by the Rasht University of Medical Sciences ethics committee (IR. GUMS. REC.1396.236).

Data availability

Data will be provided on request.

Abbreviations

BMI Body Mass Index
WC Waist circumference
WHR Waist-to-hip ratio

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How to cite this article

Ghanizadeh A, Nasseh H, Kazemnezhad E. Comparison of Somatometric Indices in Patients with Grade III Varicocele with Non-Varicocele Patients. Transl. res. urol., 2023 June;5(2):84-88.

DOI: [10.22034/TRU.2023.402743.1148](https://doi.org/10.22034/TRU.2023.402743.1148)

URL: https://www.transresurology.com/article_173111.html

