

Evaluation of Varicocele Frequency in Adolescents in the City of Isfahan

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Abstract

Background: Although varicocele can be treated, it is considered as one of the most common causes of infertility. This study was performed in order to estimate prevalence of varicocele in adolescents aging 12-14 years in the city of Isfahan.

Materials and Methods: During this descriptive analytic research, 800 secondary school students who were 12 to 14 years old were randomly chosen from all the five areas of the city. Physical examination results were considered absolutely private. Examinations could screen grades I, II, III, unilateral and bilateral varicocele. Finally, recorded data was analyzed.

Results: From 800 students examined, 133 individuals had varicocele. 74 students out of 133 individuals with varicocele, had grade I (55.6%) in the left side, 44 students had grade II (33.1%) in the left side, 4 students had grade III (3%) in the left side, and 11 students had bilateral varicocele (8.3%).

Conclusion: Considering the significant frequency of varicocele among adolescents more attention must be paid to early treatment of varicocele in order to restore the testicular function and therefore, future fertility. However late treatment may lead to testicular atrophy and irreversible consequences. Thus examination, diagnosis and treatment of possible varicocele in individuals at this range of age is highly recommended. In addition, the results of this study highlight the importance of parents' education about the consequences of varicocele on the future fertility of their children.

Keywords: Varicocele, Private, Adolescent, Infertility

Introduction

Infertility affects an estimated 60 to 80 million women and men worldwide. These accounts for between 8 to 12 percent of couples around the world who have difficulty conceiving a child at some points in their lives, and in some areas this figure reaches one-third or more of couples. In developing countries, high levels of infertility may drain limited resources off the health care systems as infertile couples repeatedly seek help for their problems. The social stigma of infertility weighs especially heavily on women, who bear the sole blame for barren marriages in many developing countries and may face divorce as a result. Although much effort has been put into treatment of infertility especially in development and improvement

of assisted reproductive techniques, however, less emphasis has been put into prevention of infertility.

A third to one half of infertility has been related to male infertility. A major cause of infertility in men is varicocele (1) which is abnormal dilation and torticulation in pampiniform venous plexus within the spermatic cord and involves 15% of young male (2, 3). 30-40% infertile males have varicocele and there is no racial distinction in the disease (1). It is rare among the male younger than 9 years old (1). Symptoms are some kind of discomfort in scrotum (1). Sometimes, it is described as a painful mass in scrotum or undergrowth testis in one side. However, it can also be symptom

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free (1).

In a study on young soldiers aging 17 to 20 years old in Isfahan in 1999 by Dr. Ghaiur, it was proved that there is a direct relation between testis atrophy and disease duration (4). Varicocele is thought to raise the temperature of the testicles or cause blood to flow back up in the veins supplying the testicles. Although the mechanism by which varicocele affects fertility is poorly understood, it seems to help damage or disrupt the sperms' form and function (5, 6). Varicocele repair is typically performed to improve the fertility of men who have both varicocele and defective sperm (6, 7). According to American Urological Association and American Society of Reproductive Medicine, infertile men with varicocele were found to have an increased number of abnormal forms, decreased motility and lower mean sperm counts. Most of these patients have demonstrated an improvement in sperm density with or without a concomitant increase in sperm motility and morphology after treatment (8, 9). A multi-center WHO study on the influence of varicocele on fertility parameters demonstrated that the mean testosterone concentration of men older than 30 years of age with varicocele was significantly lower than that of younger patients with varicoceles, whereas this trend was not observed in men without varicoceles. (3, 10, 11) Repairing varicoceles appears to improve serum Testosterone levels (12-15).

The majority of men with varicoceles remain fertile and asymptomatic. Therefore, treatment of all varicoceles is clearly unnecessary. The need for diagnosing and treating sub clinical varicoceles is also controversial (16). The authors advocate surgical correction of clinically detectable varicoceles associated with abnormal semen parameters in an infertile couple following appropriate evaluation of the female partner. This includes men with azoospermia and very severe oligospermia. Palpable varicoceles should be corrected in adolescent boys when accompanied by ipsilateral testicular atrophy or if the varicocele is very large. It has been suggested that adolescents with varicocele and an abnormal gonadotropin response to LHRH may also

benefit from repair. (8, 11) Finally, varicoceles associated with debilitating testicular pain may be considered as candidates for repair (11).

A variety of surgical approaches have been advocated for varicocele repair (varicocelectomy), including open surgery, laparoscopic, and percutaneous techniques (interventional radiology). Ideally, the perfect procedure would ligate both the veins contributing to the varix at the time of repair and those that could cause a recurrence in the future. However, some veins clearly must be preserved so as to allow drainage of blood from the testis and prevent vascular engorgement. Therefore, the ideal procedure should leave the testicular arteries, lymphatics, and vas deferens intact. A minimally invasive procedure which reduces morbidity, pain and recovery time is also desirable. (11, 17)

It must be noted that the aim of this study was only to estimate prevalence of varicocele in adolescence between 12-14 years old in order to give a more comprehensive understanding of its prevalence and the importance of screening and prevention in these ages in our society.

Materials and Methods

This is a descriptive research in which 800 subjects (12-14 years old) were randomly selected from the student population of secondary school from five locations of Isfahan. This study started from the beginning of October 2006 and lasted for 6 months.

Number of subjects:

N was calculated based on the following formula:

$$n = (z - \alpha / 2)^2 pq/d^2 = (1.96)^2 (0.17) (0.83) / (0.05)^2 = 216$$

And 216 refers to the number of students that should be studied in each level. That is, 216 students in the first year, 216 students in the second year, and 216 students in the third year of secondary school or on the whole at least 648 students should be investigated. Thus 800 students were chosen randomly based on the number of their row and table of identification numbers.

This study was initially approved by the ethical committee of Royan institute. Following

consultation of the parents and students, consent forms were signed by the parents. Physical exams were carried out by an expert trained general practitioner in an absolutely private environment. A questioner was filled by the parents of the students with varicocele one month after examination.

Before examination, students were asked to stay still on feet for at least 10 minutes, and finally they were examined in a warm room, in order to promote relaxation of the scrotal dartos muscle and facilitate accurate evaluation for varicocele. The spermatic cord was palpated between thumb and forefingers for palpable vein. Both sides of spermatic cords were palpated while patient performing a Valsalva maneuver. First, pampiniform plexus of the right testicle and then pampiniform plexus of the left testicle were tested exactly after a Valsalva maneuver. The suspected individuals with varicocele were referred to specialist for further confirmation.

Varicocele was scored based on three grades (I, II, III) and two kinds (unilateral or bilateral). Varicocele grade I is palpable with valsalva maneuver only, grade II is invisible but palpable at rest without valsalva maneuver. Varicocele grade III is visible.

The data from examinations were recorded in relevant checklists and analyzed by determining chi square. Finally, the acquired

results were presented within tables and data was recorded in relevant checklists and analyzed by performing chi-square tests.

Results

In this research 800 students in three age groups (12, 13, 14 years old) were selected and examined. Table 1 represents number and relative frequency of the students under investigation due to age. From 800 examined adolescents, 133 students (16.63%) had varicocele depicting a relative frequency of 166.3 in every 1000 students between 12 and 14 years old. This distribution was significant at $p < 0.001$. Out of 133 students, 46, 44 and 43 individuals were at the age of 14, 13 and 12, respectively (Table 1). Statistical analysis revealed no significant differences in relative distribution of varicocele among the latter three age groups ($p = 0.22$).

Out of 800 subjects examined, 74 individuals presented grade (I) varicocele in the left side. Resulting in a relative frequency of 9.25% for grade I varicocele detected. Thus, accounts for 56.6% of the total cases who had varicocele.

While from 74 cases, 28, 26 and 20 cases were at the age of 12, 13 and 14, respectively. Thus, the distribution of grade I varicocele in students of age of 12, 13, 14 were 37.8%, 35.2%, and 27% respectively. This distribution was not significantly different.

Table 1: Number and relative frequency of varicocele (grade I, II, III, and bilateral) among students due to age

Age (years)	Subjects		Subjects with varicocele								Subjects with no varicocele	
	Number	Percentage	Grade I		Grade II		Grade III		Bilateral		Number	Percentage
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage		
12	310	38.8	28	37.8	12	27.3	0	0	3	27.3	267	40
13	228	28.5	26	35.2	15	34.1	0	0	3	27.3	184	27.6
14	262	32.7	20	27.0	17	38.6	4	.5	5	45.4	216	32.4
Individuals with varicocele	133	100	74	55.6	44	33.1	4	3	11	8.3	0	0
Total No. individuals	800	100	74	9.3	44	5.5	4	0.5	11	1.37	667	100

Table 2: Number and relative frequency of individuals according to parents' educational states and referring to specialist

Refer to specialist	Yes		No	
	Percent	Number	Percent	Number
Parents' education				
Not educated	39.4	13	60.6	20
Low education	57.5	46	42.5	34
Highly educated	65	13	35	7
Total	54.1	72	45.9	61

Out of 800 subjects examined, 44 individuals presented grade (II) varicocele in the left side. Resulting in a relative frequency of 27.3% for grade II varicocele detected. Thus, accounts for 33.1% of the total cases who had varicocele. While from 44 individuals, 12, 15 and 17 individuals were at the age of 12, 13 and 14, respectively. Thus, the distribution of grade II varicocele in students of age of 12, 13, and 14 were 27.3%, 34.1%, and 38.6% respectively. This distribution was not significantly different.

Only 4 out of 800 students presented grade (III) varicocele in the left side. Resulting in a relative frequency of 0.5% for grade III varicocele and includes 3% of the total individuals who had varicocele. Type III varicocele was only found among adolescents who were 14 years old.

There were 11 students (1.37%) with bilateral varicocele. Among them, 3, 3 and 5 students were 12, 13 and 14 years old respectively, resulting in 27.3%, 27.3% and 44.4% distribution respectively. This distribution was not significantly different. Also in this study, out of 133 individual with varicocele, 122 students or 91.7% of adolescents had unilateral varicocele, and 11 students or 8.3% had bilateral varicocele. This distribution was significantly different ($p < 0.001$).

The aforementioned results have been summarized in the table 1.

Although the parents of all the students with varicocele were informed to refer to specialist (urologist), only 72 students (54.1%) out of 133 students who had varicocele referred to the specialist. Among 72 students, 35, 25 and 3 individuals had grade I, II and III varicocele respectively.

Following up 61 individuals who did not refer to specialist revealed that 14 individuals (23%) posed a problem of shyness for not referring to the specialist. 32 individuals thought that varicocele may be insignificant to their future

infertility. 15 individuals mentioned other reasons.

Table 2 shows number and relative frequency of individuals referring to doctor with respect to parents' education .The results of the table also reveal that among parents of individuals who did not refer to the specialist uneducated ones had a higher proportion.

Discussion

Infertility is a multifactorial phenomenon and the varicocele is one of the major causes of male infertility. In addition, a direct relation between the atrophy of testes and varicocele has been reported.

Considering the great social and economical burden imposed by infertility on individuals and society and the fact that varicocele is curable, thus early prevention of varicocele may have important consequences on individuals fertility and social benefits.

Epidemiological surveys may help in early diagnosis and prevention of varicocele. The results of this study reveal that 133 out of 800 students examined between the ages of 12-14 had varicocele. Resulting in a relative frequency of 166.3 in 1000 individuals which is very close to the relative frequency reported in the urology references (15%) (2, 18-20) and in the other literatures (3, 21-25).

The distribution of grade I, II and III varicocele were 9.25, 5.5 and 0.5% among the total number of examined students which accounts for 55.6, 33.1 and 3% of individuals, respectively. 1.4% of the students had bilateral varicocele, accounting for 8.3% of individuals with varicocele. Statistical analysis of results revealed that distribution or the relative frequency of various grades of varicocele at different ages was not significant ($p > 0.001$) and the results were within the range reported in the reference books (19, 20) or in the literature (24-26). Furthermore, results of this

study reveal a direct relation between the level of parents' education and their insistence to refer to specialist.

Considering the fact that varicocele may be symptom free and its consequences might be irreversible if treatment is delayed. Thus early evaluation and treatment is highly recommended.

The results of this study also reveal that majority of individuals who had varicocele (61 out of 133) did not refer to specialist for further follow up. The main reasons for this ignorance were: 1. considering varicocele as unrelated to the future infertility, 2. Shyness during referral to specialist, and 3. uneducated parents.

Conclusion

Considering the significant frequency of varicocele among adolescents and the fact that early treatment of varicocele restore the testicular function and therefore future fertility and late treatment may lead to testicular atrophy and irreversible consequences, thus examination, diagnosis and treatment of varicocele of individuals at this range of age is highly recommended. In addition during parents' education, the consequences of varicocele on fertility should be emphasized.

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