ROLE OF SCROTAL DUPLEX ULTRASONOGRAPHY VS PHYSICAL EXAMINATION IN THE SCREENING FOR VARICOCELE IN ADOLESCENTS

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Abstract

Introduction: Varicocele is an abnormal dilatation and torticulation in pampiniform plexus of veins within the spermatic cord. It involves about 15% of young males. It is considered the most common urologic problem in whole adolescence. Physical examination considered the important examination in screening for varicocele in adolescence.

Patients and methods: Three hundred boys with age range from 12 – 15 years old were chosen for this study. Physical and general examination was done in the outpatient clinics. Color duplex ultrasonography was done for all boys with standard protocol in erect and supine positions with and without valsalva maneuver. Varicocelectomy was done in 5 boys after acceptance of their parents.

Results: On physical examination 13.6% had unilateral varicocele while on color duplex examination 15.3% of the examined boys had unilateral varicocele that classified into grade I (8%), grade II (5.6%), grade III (1.3%) and grade IV (0.3%) 8% represent grade I.

Conclusion: Our conclusion: by one non invasive screening examination with color duplex ultrasonography we can increase the accuracy of detecting varicocele in adolescence with subsequent prevention of their damage effect on testis.

INTRODUCTION

Varicocele is an abnormal dilatation and torticulation in pampiniform plexus of veins within the spermatic cord. It involves about 15% of young males\(^{(1)}\). It is considered the most common urologic problem in whole adolescence\(^{(2)}\).
There is a good evidence that if left untreated with time, the varicocele will continue to affect testicular growth with loss of volume and progressive deterioration in semen analysis\(^{(3)}\).

Repair of varicocele not only reversed growth arrest but also improved semen analysis in adolescents and young male\(^{(4, 5 & 6)}\).

Although a physical examination is currently the standard diagnostic method for the diagnosis of varicocele, it is subjective and may have significant inter-physician variability. It is also limited in its capacity to detect blood flow change\(^{(7)}\).

Color duplex ultrasonography is a useful tool for accurate diagnosis and grading of varicocele and for predicting the outcome of varicocelectomy\(^{(8)}\).

The aim of our study is to evaluate the role of duplex ultrasonography as a screening tool in detection of the varicocele in adolescents.

**MATERIALS AND METHODS**

Three hundred boys with age range from 12 – 15 years old were chosen for this study. They were referred from urology, surgery, internal medicine and dermatology outpatient clinics in Benha University hospital.

They were not complaining from any scrotal, testicular or urological problems.

The study was started a April 2007 and continued for two years.

Informed consent was taken from parents.

Physical and general examination was done in the outpatient clinics.

Examination protocol including inspection, palpation and transillumination technique at rest and with valsalva while the boy in standing position.
Varicocele score based on three grades (according to Dubin – Amelar classification)⁹).

**Grade I:** palpable varicocele with vasalva.

**Grade II:** invisible but palpable at rest without vasalva.

**Grade III :** Visible varicocele.

Color duplex ultrasonography was done for all boys with standard protocol in erect and supine positions with and without Valsalva maneuver.

Duplex ultrasound protocol:
1- Boys standing 5 minutes before the examination in a warm room.
2- They examined by the use of Toshiba (Xario) ultrasound machine by a linear high frequency (5 – 7.5 mHz) probe.
3- They first examined in standing position and then in supine position.
4- Pampiniform veins studied in a gray scale and then with color and pulsed Doppler.
5- Power Doppler was used for detection of slow flow.
6- Testicular volume was assessed in both sides.
7- Reflux was recorded and classified into prolonged and intermittent.

Varicocele was graded (according to ligout 2004):
Grade I: prolonged reflux in inguinal channel during vasalva.
Grade II: Reflux in the supratesticular region with vasalva.
Grade III: Reflux in the infratesticular region with vasalva.
Grade IV: Reflux in the infratesticular region in the basal condition that increase with vasalva.

Varicocelectomy was done in 5 boys after acceptance of their parents and follow up was done after 6 months by clinical and Doppler examination.

**RESULTS**

Clinical findings: (Table 1)
Out of 300 boys examined 41 (13.6%) had unilateral left varicocele while bilateral varicocele not detected in any boy. They were classified according to Dubin – amelar classification (9) into three grades. Twenty four subject represented by grade I varicocele (8%) while fifteen boy presented by grade II varicocele (5%). Only two boys showed grade III varicocele by percentage 1% from the total number of examined boys.

Doppler findings (Table 1 & 2)

Out of 300 boys examined 46 (15.3%) has unilateral left varicocele (diagnostic criteria : veins caliber more than 2 mm and prolonged reflux more than 1 second) (fig 1) which categorized as follows:

**Table (1):** Number of the examined boys and frequency of detected varicocele by clinical and Doppler examination.

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Unilateral</th>
<th>Bilateral</th>
<th>Volume reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical varicocele</strong></td>
<td>300</td>
<td>41</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td><strong>Doppler varicocele</strong></td>
<td>300</td>
<td>46</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

**Table(2):** Frequency of varicocele grades by clinical and Doppler examination in the all examined boys.

<table>
<thead>
<tr>
<th></th>
<th>No.</th>
<th>Positive</th>
<th>GI</th>
<th>GII</th>
<th>GIII</th>
<th>GIV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical</strong></td>
<td>300</td>
<td>41</td>
<td>22</td>
<td>16</td>
<td>3</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13.6%</td>
<td>7.3%</td>
<td>5.3%</td>
<td>1%</td>
<td>--</td>
</tr>
<tr>
<td><strong>Doppler</strong></td>
<td>300</td>
<td>46</td>
<td>24</td>
<td>17</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15.3%</td>
<td>8%</td>
<td>5.65</td>
<td>1.3%</td>
<td>0.3%</td>
</tr>
</tbody>
</table>
Fig.(1) : Reflux on valsalva moe than 1 sec

Fig.(2): Prolonged reflux in inguinal channel during valsalva.

Fig.(3) Reflux in the supratesticular region with valsalva.

Fig.(4) : Reflux in the infratesticular region with valsalva

Fig.(5): Reflux around testicle increased with valsalva

Fig.(6): Reduction in prostate volume with grade IV varicocele.
DISCUSSION

Varicocele is the term used to describe varicose testicular veins in scrotum. It is the most common urologic problem in male adolescent. It is associated with decreased sperm count and motility and testicular volume loss\(^{(2)}\).

Although varicocele is common in adolescence, it is rarely causes symptoms and is often diagnosed on the routine physical examination\(^{(10)}\).

As the fact that varicocele is curable, thus early prevention and treatment of varicocele may have important consequences on individuals fertility and social benefits\(^{(11)}\).

The presence of varicocele is associated with elevated scrotal and testicular temperature and altered spermatogenesis and is also associated with testicular growth arrest which is time dependent\(^{(12-13)}\).

Lyon and associated found no correlation of varicoceles grade and testicular size in adolescents while in contrast Skoog and Steeno independently noticed that boys with severe varicocele have a smaller ipsilateral testicle\(^{(14-17)}\).

It was also noticed that the smaller the testis, the worse the semen analysis\(^{(18)}\).

Boys with varicocele are at significant risk for testicular growth arrest irrespective of varicocele size and those with grade III have a higher risk of testicular growth arrest than those with a grade II and grade I varicocele\(^{(19)}\).

The testicular function most affected by varicocele is spermatogenesis, however testicular growth arrest may be considered the hallmark of testicular damage in adolescence varicocele\(^{(20)}\).
Many radiologists have advocated ligation of varicocele (repair) early during adolescence at the time of diagnosis in order to prevent testicular damage and future infertility\(^{(2)}\).

Kin et al., 1998 suggest that scrotal Doppler ultrasonography is a reliable means of confirming the clinical varicocele and screening the subclinical varicocele\(^{(21)}\).

Reggiani 1990\(^{(22)}\) state that Color Duplex ultrasonography CDUS can objectively rule out 26% of cases with clinical obvious varicocele. It helps to avoid unnecessary varicocelectomy in cases as judged by physical examination alone.

Sonographic and Doppler examination can also classify varicocele into grades more accurately than physical examination.

So, the aim of our work is the early diagnosis of asymptomatic varicocele in adolescence in order to prevent subsequent testicular damage and bad semenogram using both physical and CDU as a screening tool.

The result of this study revealed that 41 out of 300 boys examined (13.6%) between the ages of 12-15 years had varicocele by physical examination, however 46 boy (15.3%) had positive sonographic and Doppler findings of varicocele. Marked improvement after varicocelectomy in the operated cases.

We are agree in our results with Gurrero et al., 2004 which stated that ultrasonound screening allow diagnosis of more pathologic conditions than physical examination\(^{(23)}\).

**Our conclusion:** by one non invasive screening examination with color duplex ultrasonography we can increase the accuracy of detecting varicocele in adolescence with subsequent prevention of their damage affect on tests.
REFERENCES


13- Ozbek, E; Turkoz, Y; Gokdeniz, R; Davarci, M; Ozugurlu, F. Increased nitric oxide production in the spermatic vein of patients with varicocele. Eur Urol. 2000; 37 : 172 – 175.


