

The value of radionuclide scintigraphy in the diagnosis of varicocele

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Varicocele is an important etiological factor of male infertility which is caused by retrograd venous flow through the internal spermatic vein. It is most common surgically correctable cause of male infertility. The term of "subclinical varicocele" is used when there is not any manifest clinical evidence of varicocele or if there is a suspicious varicocele diagnosis on clinical examination. Several methods are available to detect spermatic venous reflux. These methods include scrotal contact thermography, Doppler sonography, radionuclide scintigraphy and gonadal venography. Between January 1989-July 1990, 52 varicocele patients have been evaluated in our infertility polyclinics. Among the others, radionuclide angiography have been used as a diagnostic method. In this study, we concluded that radionuclide scintigraphy was not sensitive enough to detect subclinical varicocele [Turk J Med Res 1993; 11(6): 295-298]

Key Words: Varicocele, Radionuclide scintigraphy

Varicocele is one of the etiological factors of male infertility, rised by retrograd venous flow through the internal spermatic vein (1-5). It generally takes place on the left spermatic venous system (2,4-6). And only %40 of patients who applied to infertility clinics have varicocele. The incidence in the population is 8-20% and generally without any fertility problem (3).

This type of pathology can be corrected by operation while, 71% the seminal parameters are corrected and 37% pregnancies are observed (3,6).

Several parameters have been considered as the reason of the infertility introduced by varicocele. These parameters are as follow; the temperature increase in the scrotum, the retrograd flow through the internal spermatic vein from the adrenal and renal veins, hypoxia rised due to blood stasis in testis, tissue degeneration and dysfunctions in the testicular hormone synthesis (3).

Clinically varicoceles can be graded from I to III (7). The varicoceles which couldn't be detected but proved by diagnostic methods, are named as "Sub-

clinical varicocele" (6). Also it has been reported that the grade of varicocele doesn't have an effect on the spermatogenesis.

Scrotal contact thermography, Doppler sonography, radionuclide scintigraphy and gonadal venography are the diagnostic methods used in the detection of varicocele (1,2,4,7,8,9).

This study is devoted for the evaluation of the predictive value of radionuclide scintigraphy in the diagnosis of clinical and subclinical varicoceles.

MATERIALS AND METHODS

In this study the patients who applied to infertility polyclinic Medical School of Istanbul University were sampled. Radionuclide scintigraphy was used as a diagnostic method in 52 patients with varicocele. All varicoceles were divided into 3 groups according to the clinical examination; grade I was coined to the patients who could be palpated by Valsalva. The grade 2 group was consisted from the patients whose varicoceles could be palpated without Valsalva, and the 3rd grade was consisted from the varicoceles which could be detectable by eyes. The patients with suspicious varicoceles formed another group.

The control group was consisted of the healthy fertil volunteers having normal spermiogram results. In

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Table 1. Spermogram results of the groups.

	Normal (n:11)	Varicocele (n:34)	Suspicious (n:7)
Infertility period (Year)		6.15	4.64
Number of sperm (mil/CC)	54	20.2	25.8
Motility (%)	72.5	25	27.7
Morfoloji (%)	86	72.6	76.2

some cases one of the testis may have varicocele but not the second one. So this group of patients were classified as another group.

In the radionuclide screening 10-15 mCi 99 m Tc-RBC (labelled erythrocyte) technique was used. The patients were asked to discharge their bladders. 20 minutes after the application of the RBC kit, 10-15 m Ci Tc-99m was given. On fixing the penis in to the suprabupic region the patient was asked to stay in front of the camera. (Siemens Orbitec Gamma Camera and LEAP Collimator was used. With microdot imager for x-Ray images. 800.000 counts were recorded to the PC by Siemens Microdelta.)

The computer images were obtained from both hemiscrotums and 60 pixel simetric areas were used in counts. The datas were obtained by dividing the counts to the total count (800.000). For the statistical analysis students t-test was used, by the way the results of the study group could be compared with the control group.

104 scrotal compartments of 52 patients were investigated. 22 scrotums formed the control group, 34 contrilateral testis without varicocele, 9 suspicious varicoceles, 19 grade 1, 9 grade 2 and 11 grade 3 serotums formed the study group.

The average age of the control group was 32.5 while for study group 30.8 years.

RESULTS

The spermogram results of all the groups subjected in this study were given in Table 1. A significant decrease in the number and motility of sperms were observed in the subclinical and clinical varicoceles. We believe that these results are important for the illustration of the fertility status rather than the statistical results. By the way we tried to express not only the differences in the spermograms but in fertility status as well.

$\frac{\text{Counts in 60 pixel region}}{\text{Total Count}} \times 100.000$ was the

formula which used in the scintigraphic measurements and in Table 2 the distribution according to the groups were given. The values of subclinic varicocele group was insignificantly different than that of the control group ($p>0.3$) However, by the use of scintigraphy, clinical varicocele group could be completely differed from the control group ($p<0.05$).

DISCUSSION

Since late 1800, varicocele has been coined as one of the major male infertility problems. The patients who applied to the infertility clinics had varicocele in 40% and mostly located on the left side (3,6). In 1975 Dubin and Amelar reported that 86% of the patients had left sided varicoceles and only 14% had bilateral varicocele, but in 1981 the percentages were changed as 40% left, 4% right and 56% bilateral varicoceles have been reported (6). Clinical validations have been used for the first report however by the development of new methods in the diagnosis of varicocele the distribution of the percentage have been changed. Nowadays, Doppler ultrasonography, scrotal thermography, radionuclide screening, scrotal ultrasonography and gonadal venography techniques are available (1,2,4,6,7,8,10).

By the development of new varicocele diagnostic techniques, the incidence of the detected varicocele in infertile male has significantly increased (6). The same property was valid for the subclinic varicocele. (The incidence of the subclinic varicocele varied within 12-75% according to the diagnostic procedures (6)).

It has been previously reported that, the grade of varicocele hasn't any effect on fertility (11). Subclinic varicocele could disturb the seminal parameters, as the subjects in our subclinic varicocele group were comparable to the seminal parameters in the varicocele group (Table 1).

When the diagnostic methods were concerned gonadal venography was thought to be the most confident one. During the catheterisation false positive results might be obtained if the process started from 1 cm distal of spermatic vein drained to renal vein (1,2,6,9). However gonadal venography is an invasive method, but by combination with other methods this disadvantage may disappear. This method isn't applicable in our country.

Radionuclide scintigraphy is a noninvasive and reproducible method used in the diagnosis of varicocele. This study is devoted to determine the predictive value of this method in varicocele diagnosis. The average counts for the control group was 341.2. The counts obtained from the scrotal compartment in which the varicocele couldn't be detected by palpation was 342.4. These results were statistically insignificant ($p>0.05$). So the scintigraphic measurements were valuable for this group.

Tablo 2. Scintigraphic measurements of the groups.

Groups	n	Average of the counts	SD	p
Normal Control	22	341.2	180.0	—
No contrilateral varicocele	34	342.4	95.8	p>0.5
Suspicious varicocele	9	389	92.4	0.5>p>0.3
Grade-I varicocele	19	477.2	242.4	0.05>p>0.02
Grade-II varicocele	9	633.8	297.9	0.01>p>0.001
Grade-III varicocele	11	655.3	284.1	0.001>p

The difference in the scrotal compartment counts ratio for the suspicious (389) and subclinic varicocele (341.2) was statistically insignificant. ($p>0.3$). In the discernment of these two cases the scintigraphic method was vulnerable. The incidence of the subclinic varicocele was reported as 12-75% in the literature. If we thought that this ratio was reflected to the suspicious varicocele group in our study, a statistically significant difference should took place with the control group. By the development of diagnostic methods; we hope to detect varicoceles in the patients who had left varicoceles. By panpiniform vein scintigraphic examination the unpalpable varicoceles should be detected in 60%. However the difference between the control group and the study group was insignificant. Meantime; the high subclinic varicocele ratio was thought to reflect to the suspicious varicocele group. The subclinic varicocele is a pathology that could not be determined by physical examination and in this study the scintigraphic results of this group and grade 1 varicocele didn't show a significant difference in other words subclinic varicoceles couldn't be differed from normal and grade I varicoceles. Therefore it can be concluded that the sensitivity of radionuclide scintigraphy was insufficient. This finding was also supported by the results of Doppler ultrasonography however the number of our cases aren't adequet for statistical analysis. With color Doppler ultrasonography we have detected 6 varicoceles in 9 suspicious cases. All of the cases had; negative findings in their physical examination, compatible seminal parameters with infertile group and positive varicoceles were detected by Doppler ultrasonography. If these finding were concerned as "subclinic varicoceles" the scintigraphic methods were vulnerable.

When the graded varicoceles were compared with the control group significant differences were observed. These are; for grade I; 341.2-477.2 ($0.05>p>0.02$), grade 2: 341.2-633.8 ($0.01>p>0.01$) and grade 3 341.2-655.3 ($p<0.001$). As the grade of varicoceles increased, the difference between the normal group became more significant.

By using radionuclide scintigraphy, the varicoceles (which could be detected by physical examination) could be perfectly differed from the normal hemiscrotum but subclinic varicocele.

In a study directed by WHO the gonodal venography, Doppler ultrasonography, radionuclide scintigraphy and scrotal thermography methods were compared for the detection of subclinic varicocele. All methods were validated according to the comparison by the gonodal venography. The scrotal thermography and Doppler ultrasonography combination was the most sensitive one (9). [Scrotal thermography could be effected from the enviroment (9)].

Further studies are still going on for the detection of subclinic varicocele by using combined form of non-invasive methods. By this way the sensitivity may increase therefore; we are still working on the combined studies of radionuclide scintigraphy and Doppler ultrasonography.

Varikosel tanısında sintigrafinin yeri

Varikosel spermatik vene retrograd kan akımıyla oluşan, erkek infertilisinde önemli yer tutan, cerrahi tedaviyle büyük oranda düzeltilebilen bir patolojidir. Klinik muayene ile şüpheli bulunan veya şap-tanamayan, diğer tanı yöntemlerine ihtiyaç duyulan varikoseller için "subklinik varikosel" tanımı kabul edilmektedir. Varikosel tanısında çeşitli yöntemler kullanılmaktadır. Bunlar arasında skrotal termografi, Doppler ultrasonografi, radyonüklid anjiyografi (sintigrafi) ve gonadal venografi sayılabilir.

Bu çalışmada, Ocak 1989-Temmuz 1990 tarihleri arasında incelenen 52 varikosel vakası ele alınmış, radyonüklid sintigrafi ve klinik muayene bulguları, kontrol grubu ile karşılaştırılmıştır. Klinik de-recelendirme ve sintigrafi bulguları arasında tam bir korelasyon şap-tanmasına rağmen, subklinik varikosel şüphesi ile incelenen vakalar ve kontrol grubu arasında istatistiksel bir fark ortaya konulmamıştır. Radyonüklid sintigrafinin varikosel tanısında yeteri kadar sensitif bir yöntem olmadığı sonucuna varılmıştır. [Turk J Med Res 1993; 11(6): 295-298]

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