



Significance of subclinical varicocele in male infertility

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Abstract:

Background: Varicocele is the most common cause of male infertility. 20-30% of men with varicocele are infertile. The clinically obvious varicocele is identifiable and correctable cause of male infertility, but less is known about the subclinical varicocele and its relationship to infertility. However, subclinical varicocele seems to be an important causal factor in infertility and hence scrotal ultrasonography has led to its increased use in diagnosis of subclinical varicocele. The present study is undertaken to reveal incidence of subclinical varicocele in patients with severely impaired fertility potential. **Aim:** To find out prevalence of subclinical varicocele in subjects of severely impaired fertility potential. **Material and methods:** The semen samples were obtained from 31 male partner (age- 25-40 years) of infertile couples (sperm count less than 1million/ml) attending the infertility clinic of Physiology Department, MGIMS, Sevagram. They were analyzed for routine seminogram parameters. In this study we evaluated male subjects with severely impaired fertility potential by scrotal ultrasonography, Follicle Stimulating Hormone, Luteinizing hormone & free testosterone. **Results:** The subclinical varicocele was present in 12 subjects out of 31 infertile males evaluated. Percentage prevalence of subclinical varicocele was observed to be 39%. Hormonal levels of all the subjects studied were within normal limit. There was no significant difference in testicular volume of affected side & contra lateral side of infertile male subjects. **Conclusion:** Scrotal ultrasonography is an important investigation to reveal subclinical varicocele for early diagnosis and management of these infertile male subjects.

Key words: Male infertility; Scrotal Ultrasonography; Subclinical Varicocele; Varicocele

Introduction

A varicocele is a vascular abnormality of the scrotum that is defined as pathological dilations of venous pampiniform plexus [1,2] resulting from absence or incompetence of the valves of the internal spermatic vein [3-6].

Varicocele are currently the most common abnormality identified in male being evaluated for infertility [1, 7, 8]. The incidence of varicocele in the general population is approximately 15%, while 19-41% of male presenting for infertility investigation demonstrates varicocele [2,9,10]. Studies have shown that subclinical (non palpable) varicocele's are much more common, being present in 44 % fertile men and ~ 60 % of men attending infertility clinics [1,11,12].

The history of presence of varicocele can be traced back to 1st century A.C. when Greek physician Celsus noted that “The veins are swollen and twisted over the testicle, which becomes smaller than its fellow, in as much as its nutrition has become defective” [13]. The first notice that varicocele might be related to infertility was made between the end of the 19th and the beginning of the 20th century when surgical repair of varicocele was shown to improve the quality of sperm [13]. Tulloch in 1952 first reported that bilateral surgical repair of varicocele in a man with azoospermia resulted in an increase in sperm concentration and a spontaneous pregnancy [13,14].

Varicoceles are normally diagnosed by physical examination through palpation of spermatic cord [1]. The non-palpable enlargement of the venous plexus of the spermatic tone, which is diagnosed only by imaging techniques, is defined as subclinical varicocele [8, 13]. The subclinical varicocele can be detected by radiological imaging studies such as Scrotal Ultrasonography (USG). Scrotal USG is a noninvasive, inexpensive technique and is very sensitive in the diagnosis of subclinical varicocele. [3,15,16].

Infertile male without palpable scrotal lesion (subclinical) are generally not referred for sonographic studies [3]. Hence, we undertook this study in order to find out the significance of subclinical varicocele in male infertility.

Material and Methods

The present study was conducted to find out the prevalence of subclinical varicocele in subjects of severely impaired fertility potential. The semen samples were obtained from 31 male subjects (age group of 25-40 years) who were selected from among the male partners of the infertile couples (sperm count less than 1million/ml), who attended the Reproductive Biology Unit (Infertility Clinic) of the Department of Physiology, MGIMS, Sewagram.

The cases of primary as well as secondary infertility were included in the study and they were referred from the Department of Obstetrics and Gynaecology. The clinical examination of the external genitalia was done at the Surgery out patient department. The present study was approved by Institutional Ethics Committee of MGIMS, Sevagram, Wardha, India. After explaining the purpose of the study, the procedure which was involved and the confidentiality of the data, informed written consents were obtained from all the subjects. Subjects were asked to observe three days of sex abstinence and their semen samples were collected on the fourth day. The semen samples were collected by masturbation. After complete liquefaction of the semen samples at room temperature, each sample was tested for the physical seminogram parameters.

The routine semen analysis was done by using the SQA II C-P (Sperm Quality Analyzer) [Medical Electronic System Ltd. Israel] for the sperm concentration (millions/ml), the percent sperm motility and the percent normal sperm morphology according to the WHO guidelines (WHO, 1987). In this study we evaluated male subjects with severely impaired fertility potential by scrotal USG, Follicle

Stimulating Hormone (FSH), Luteinizing Hormone (LH) & free testosterone.

Statistical analysis: The statistical analysis of the data was done under the guidance of statistician. The data was reported as mean ± SD. P values of less than 0.05 were considered as statistically significant.

Results

Table no.1 shows the mean values of right testis volume (milliliter) in control group is 16.18 ± 9.46 and left testis volume is 15.98 ± 8.74 and in sub clinical varicocele group mean value of right testis is 15.29 ± 6.45 with left testis volume is 16.62 ± 7.02. There was no significant difference in testicular volume of affected side & contra lateral side of infertile male subjects.

Table 1: Testicular volume in Control group and sub clinical varicocele group

GROUP	CONTROL GROUP	SUB CLINICAL VARICOCELE GROUP
RIGHT TESTIS VOLUME(ml) (MEAN ± S.D)	16.18 ± 9.46	15.29 ± 6.45
LEFT TESTIS VOLUME(ml) (MEAN ± S.D)	15.98 ± 8.74	16.62 ± 7.02

Figure 1: Comparison of both testicular volumes in control and sub clinical varicocele group

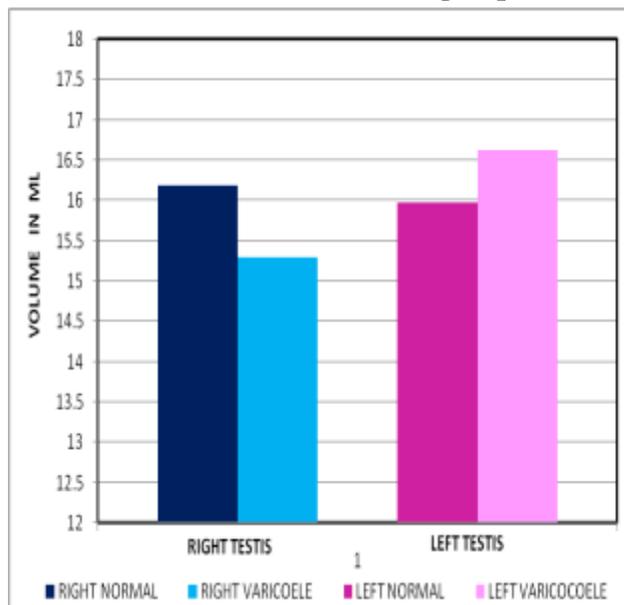
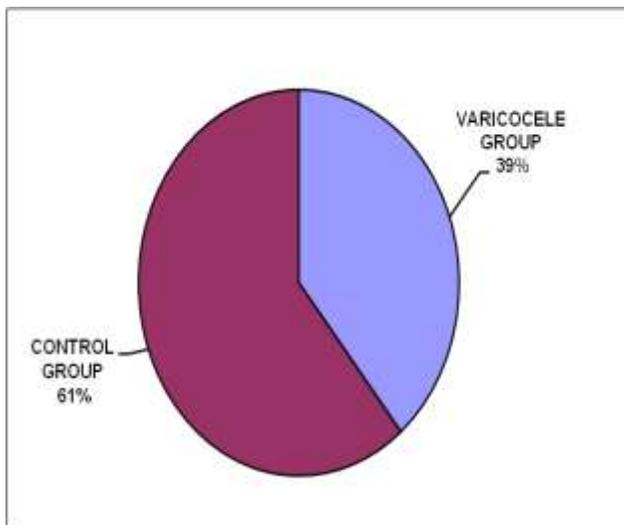


Table 2: Prevalence of subclinical varicocele in infertile males

Total no. of cases	Total no. of cases having subclinical varicocele	Prevalence of subclinical varicocele
31	12	39%

Figure 2: Prevalence of subclinical varicocele in infertile males



Discussion

In the present study we found that right and left testicular volumes are not significantly different in men with subclinical varicocele. Also testicular volume on affected side was not significantly less than contra lateral side. Testicular volume of subjects with subclinical varicocele was not significantly different from testicular volume of control subjects. Hence our study concluded that the prevalence of subclinical varicocele in the infertile male is almost equal to incidence of clinical varicocele in the patients with primary infertility. The prevalence of varicocele in adult male in general population is 15% and Prevalence of varicocele in primary infertility 30-40% [17] secondary infertility 50-80% [7,18]. Our study does not support the findings of Lipschultz et al and Zini et al who demonstrated testicular

volume in men with varicocele was significantly decreased compared to controls without varicocele. [19,20].

Varicocele has a detrimental effect on fertility was supported by existence of a relatively higher frequency of men with varicocele among infertile population (25.4 %) than men with normal sperm quality (11.7%) [21,22]. Macleod in 1965 described semen parameters abnormality in infertile male with varicocele [23]. Nagao et al (1986) also indicated that hormonal abnormalities can be observed in both fertile and infertile men with a varicocele, suggesting some degree of testicular dysfunction in all men with a varicocele [24]. The decrease in plasma testosterone concentrations (hypoandrogenic state) which affects spermatogenesis were found in patients with varicocele [2,7,25]. The pathophysiology of the varicocele effect on fertility remains unclear but it is suggested that it impairs normal testicular functions by elevating scrotal temperature via reflux of warm abdominal blood through incompetent valves of spermatic veins [1,26-28]. WHO presented similar results in multi-centric study which evaluated physical findings & semen characteristics of men presenting for infertility [29].

Various imaging studies employed for subclinical varicoceles are scrotal USG, venography, thermography and radionuclide scrotal scanning [1,3,30,31]. The study conducted by Gonda et al showed that sonography was positive for subclinical varicocele in 95% of patients, while nuclear scanning was considered positive in only 55% [3]. The availability, reproducibility, non invasiveness of scrotal USG has lead to its increased use in the diagnosis of varicocele. Detection of subclinical varicocele is important for the decision making process & further investigated by USG.

Treatment of cases with subclinical varicocele is controversial. Partial beneficial effect on sperm parameters was demonstrated in infertile patients with subclinical varicocele in randomized controlled study [32]. A significant increase in sperm density and total motile count was recorded 1 year after operation [21]. Some of the authors have suggested improvement in sperm parameters after varicocelectomy with men having subclinical Varicoceles [33-36]. Study conducted by Gonda et al proved that surgery showed improvement in the semen parameters (count and motility) in patients with subclinical varicocele and patients became fertile. The favourable pregnancy rates were achieved in those patients who were treated and this emphasizes the importance of making the diagnosis of subclinical patients [3].

Long term follow up of these subjects should be carried out to know the progress of this varicocele. Treating such subclinical varicocele will improve the seminogram parameters and fertility potential of these subjects needs to be investigated. Lack of standardized criteria for diagnosis and conflicting treatment outcome of subclinical varicocele raise questions about the existence & significance of this entity. The exact impact of subclinical varicocele on impairing infertility cannot be revealed due to small size of population in our study.

Conclusion

Scrotal USG is an important investigation to reveal subclinical varicocele for early diagnosis and management of these infertile male subjects. Because a gold standard that defines the presence of a subclinical varicocele has not yet been established, new criteria may be needed.

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