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VARICOCELE: PREVALENCE, INCIDENCE AND VARICOCELE RELATED TESTICULAR ATROPHY

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ABSTRACT

Varicocele is characterized by abnormal tortuosity and dialatation of the pampiniform plexus veins within the spermatic cord and it is one of the causes related to male infertility. The aim of our study was to determine the prevalence, site of varicocele, incidence of secondary infertility due to varicocele and varicocele related testicular atrophy in adults. The study was conducted on 175 patients presenting with infertility and other problems. Of 175 patients, 75 were diagnosed with varicocele. We found the prevalence of varicocele to be 22.85% and the incidence of varicocele 45.0% in adults. The complaint of infertility in the population with varicocele was 72.7%. Atrophy of testis was noticed in 22.5% cases and it was associated with severity of varicocele. We conclude that early diagnosis of varicocele is important to prevent future infertility.

KEYWORDS: Vericocele, Pampiniform, Prevalence, Atrophy.

1. INTRODUCTION

A Varicocele is an abnormal tortuosity and dialatation of the pampiniform plexus within the spermatic cord that results from valvular incompetence of the spermatic vein. The prevalence of varicocele is approximately 15-20% in the general population and 30-40% in infertile males and upto 80% in cases of secondary infertility.[1,2,3] It rarely appears before age of 10 years and it tends to persists throughout life, if left untreated. The definitive etiology of varicocele is not well known, but it's increased frequency of presentation on the left side has

led to the discussion of several theories. These include an increased length of left spermatic vein, it's right-angle entry into the higher pressure left renal vein, an increased absence of valves in the left spermatic vein compared with the right and the possibility of the "nutcracker" phenomenon with compression of left renal vein between the aorta and superior mesenteric artery.[4,5] Varicocele are almost always larger and more common on the left side, upto 50% of cases have bilateral varicoceles.[6] Varicocele are detected and graded by physical examination.[7,8,9] Early detection is important because varicocele occasionally may cause infertility and rarely it's a sign of intra-abdominal cancer.[1,9,10]

The aim of the present study was to determine the prevalence, site of varicocele, incidence of secondary infertility due to varicocele and varicocele related testicular atrophy in adults.

2. MATERIALS AND METHODS

Study was conducted on 175 patients presenting with infertility and other problems in Department of Jarahat (Surgery), Ajmal Khan Tibbya College & Hospital, AMU, Aligarh.

Patients of age group 15-40 years attending surgery OPD were screened and the patients with coexisting morbid conditions like diabetes, Heart Disease, Malignancy, Haematologic disorders, History of drug abuse or chronic debilitating diseases were excluded.

Patients recruited in the study were thoroughly examined. The volume, position and consistency of the testes and epididymis were examined and each spermatic cord was palpated in the standing position and during the Valsalva maneuver. Findings were graded according to the system of Dubin, 1970 and Amelar, 1987 as follows.

Grade I: Varicocele palpable only during Valsalva maneuver in upright position.
Grade II: Varicocele palpable in upright position without the aid of Valsalva maneuver.
Grade III: Varicocele is both palpable and visible through the skin of scrotum without the aid of Valsalva maneuver in the upright position.

Scrotal ultrasound was done to evaluate the testicular size and testicular atrophy was defined as any testis with a volume of <15 ml or a testis 25% or smaller than it's contralateral mate.

3. RESULTS AND DISCUSSION

Out of 175 patients with different problems, 75 patients were having genital problems or infertility. After investigations among these 75 patients 40 were diagnosed with Varicocele

and 35 patients were found to have diseases without varicocele. We found that the incidence of varicocele was 22.85%, among 40 patients 29 patients were unmarried and 11 were married. We found that the complaint of infertility in the population with varicocele was found to be 72.7%.

Maximum number of (45%) cases are in age group of 21-25. 27.5% cases are in age group of 15-20 years and 22.5% in age group of 26-30 years. The diagnosis in group 15-20 was accidental or they came with mild discomfort or pain and swelling (Table no.1). Table no. 1 also shows distribution of varicocele in married and unmarried population. In age group of 15-20 years 01 patient was married as well as infertile. In 21-25 years of age group 05 (29.41%) were married and of these 05, three were infertile. In 26-30 years of age group, 8 patients were married and of them 3 were infertile. In 31-35 years of age group, only one patient reported, who was married and infertile. In 36-40 years of age group, 01 patient reported and he was fertile. The earliest description of varicocele dates back to the first century AD, The famous Roman Physician Celsus (30 BC- 45or 50 AD) discussed testicular atrophy with swollen scrotal vein in his book La Medicina.[11] At present varicocele is recognized as the leading cause of male infertility. The prevalence of varicocele has been studied extensively and the results are complex. It is present in approximately 15% of all population. In contrast, 35% of men with primary infertility and 70% of men with secondary infertility present varicocele.[12] In a large study the prevalence was 11.7% in general population and 25.4% in infertile male population.[13,14] Akbay et al. in 2000[15] detected varicocele in 293 (7.2%) of 4052 patients. In 2006 Pfeiffer et al,[16] performed a doppler based study on the prevalence of varicocele in 2008 adolescents and detected varicocele in 42.7%. They concluded that this condition is common in adults. Mickenicius and Bosas, in 2002[17] studied one hundred patients and they found varicocele in 24% of all patients. In our study we found it to be 22.85% and it matches the prevalence of previous studies.

Little emphasis has been placed on the incidence of varicocele in adolescents. 10-15% varicocele incidence is reported in adolescents.[18] We have noted 45.0% incidence of varicocele in adolescents (Table-1). These patients require a close follow-up and treatment to prevent the future fertility problems. The peak age of diagnosis is 21-25 years, as observed in our study.

Table no. 2 shows the distribution of disease in patients without varicocele. Out of 75 patients, 35 patients were not suffering from varicocele. Primary infertility was noted in total

of 20% of patients, of them 06 (17.14%) reported with the complaint of having primary infertility, while 04 patients (11.42%) were having undescended testis. Atrophy of testis was reported in 04 (11.42%) patients, 10 (28.57%) were having hydrocele, 9 (25.71%) patients suffered from epididymorchitis. There was 01 case (2.85%) of Arteriovenous malformation, while there was 01 (2.85%) case of urinary tract infection, Hence there were 35 patients in total to whom we examined and found no case of varicocele. 07 (20.0%) patients among these 35 patients without varicocele were found infertile.

Infertility is one of the important issues of human societies. The average prevalence of infertility in different societies is 8-12%[19] and the reasons are innumerous. Many studies have been conducted dealing with male infertility and factors affecting it.[20] Varicocele and it's association with infertility has been recognized for many centuries and is found in 75%-81% of those with secondary infertility[21], in this study, 72.7% secondarily infertile participants were affected by varicocele.

Table no. 3 shows 70% cases are of unilateral and 30% cases are of bilateral varicocele and of unilateral cases 92.8% are left unilateral while only 7.2% are right unilateral. It is not clear why varicocele occur. There are many theories attributing them to the lack or incompetence of valves in the internal spermatic vein[22], the junction between the spermatic vein and left renal vein[23], regonadal bypass[23], decrease of the activity of the cremaster with the spermatic cord[24], compression of the left renal vein between the aorta and the inferior mesenteric artery[26], abdominal tumor[27] and renal tumor on either side.[28]

It is also not clear that why varicocele is more common on the left side, although this has been attributed to the pressure caused by descending or sigmoid colon.[24] Fifteen percent of males have varicocele, which is predominantly left sided (approximately 85-90%), although bilateral varicocele has been found in upto 30% of cases.[29] In our study the predominance of left sided varicocele was 92.8% with 30% bilateral cases of varcocele. The reason behind this phenomenon may be that the left testicular vein drains into the left renal vein and may suffer compression under the superior mesenteric artery and abdominal aorta. Moreover, the drainage of the left testicular vein the left renal vein, that too almost at right angle may predispose the condition.

Table no. 4 demonstrates that the atrophy is associated with severity of varicocele. In the patients with grade I of varicocele only 8.33% of the patients developed atrophy of the testis,

50% of the population with atrophy of the testis was found to have grade II varicocele, while atrophy was observed in 38.46% of the patients with grade III varicocele.

The importance of varicocele lies in its common presentation in general male population and in infertility clinics. Celsus in the first century AD noted testicular atrophy on the side of varicocele.[30] Various series of studies demonstrated the varicocele as a cause of male infertility and testicular atrophy and It is widely accepted that varicocele can cause progressive damage to the affected testis, leading to testicular atrophy and reduced fertility.[31, 32, 33, 34, 35] We also noted the atrophy of testis in our study in 22.5% of cases and it's association with severity of varicocele.

Table 1: Distribution of varicocele patients according to the age.

Age group in years	Patients		Marital Status		No. of Patients with infertility
	No. of Pts.	%	Married	Unmarried	
15-20	11	27.5	01	10	01
21-25	18	45.0	03	15	03
26-30	09	22.5	05	04	03
31-35	01	2.5	01	00	01
36-40	01	2.5	01	00	00
Total	40	100	11	29	08 (72.7%)

Table 2: Distribution of disease in patients without varicocele.

Diagnosis	No. of patients	No. of Patients with infertility
Primary Infertility	06	06
Undescended testis	04	-
Atrophy of testis	04	-
Hydrocele	10	-
Epididymorchitis	09	-
Arteriovenous Malformation	01	01
Urinary tract infection	01	-
Total	35	07 (20%)

Table 3: Distribution of the patients according to the side effected.

Patients with Unilateral varicocele		Patients with Bilateral varicocele
28 (70%)		12 (30)%
Right	**Left**	
02 (7.2%)	26 (92.8%)	

Table no. 4: Relation between grade of varicocele and atrophy of testis.

Grade	No Atrophy	Atrophy (Percentage)
I	12	01 (8.33%)
II	06	03 (50.00%)
III	13	05 (38.46%)
Total (40)	31	09 (22.5%)

CONCLUSION

We have noted the prevalence of varicocele in 22.85% population and the incidence of varicocele in 45.0% of adolescents (21-25 years of age group). Our findings supported the previous studies in respect to the predominance of left sided varicocele. In our study 72.7% secondarily infertile participants were affected by varicocele and 22.5% of cases with testicular atrophy. The atrophy of testis was found to be associated with severity of varicocele, Therefore it can be concluded that the peak age of diagnosis of varicocele is 21-25 Years and the patients with varicocele are at increased risk of arrested testicular growth, which results in testicular atrophy. Thus early diagnosis is important to prevent future infertility.

Conflict of interest: There is no conflict of interest.

REFERENCES

1. Clarke B G. (Incidence of varicocele in normal man and among men of different ages). JAMA, 1966; 198: 1121-2.
2. Johnson D E, Pohl D R, Rivera-Correa H. (Varicocele: an innocuous condition?). South Med J., 1970; 63: 34-6.
3. Jarow J P. (Effects of varicocele on male fertility). Hum Report update, 2001; 7: 59-64.
4. Saypol D C. (Varicocele). J. Androl., 1981; 2: 61-71.
5. Coolsaet B L. (The varicocele syndrome: Venography determining the optimal level for surgical management). J. Urol. 24: 833-9.
6. Abdulmaaboud M R, Shokeir A A, Farage Y, et. al. (Treatment of varicocele: a comparative study of conventional open surgery, percutaneous retrograde sclerotherapy). Urology, 1998; 52: 294-300.
7. Dubin L, Amelar, R D. (Varicocele size and results of varicocelectomy in selected subfertile men with varicocele). Fertil Steril. 1970; 21: 606-9.
8. Amelar R D and Dubin L. (Right Varicocelectomy in selected infertile patients who have failed to improve after previous left varicocelectomy). Fertil. Steril. 1987; 47: 833.

9. Dubin L, Amelar RD. (Etiologic factors in 1294 consecutive cases of male infertility). 1971. Fertil Steril. 22: 469-474.
10. Turner T T. (Varicocele: Still an enigma). J Urol. 1983; 129: 695-699.
11. Kaufman D G, Nagler H M. (Specific nonspecific nonsurgical therapy in male infertility). Urol Clin North Am. 1987; 14: 489-498.
12. Witt M A, Lipshultz L I. (Varicocele: A progressive or static lesion?). Urology. 1993; 42: 541-3.
13. Madgar I, Weissenberg R, Lunen feld, B, Karasik, A, Gold Wasser B. (Controlled trial of high spermatic vein ligation of varicocele in infertile men). Fertil Steril. 1995; 63: 120-4.
14. Nieschalg E, Hertle L, Fischedick A, Behre H M. (Treatment of Varicocele: Counselling as effective as occlusion of vena cava spermatica). Hum Repord. 1995; 10: 347-53.
15. Akbey E, Cayan S, Doruk E, Duce M N, Bozlu, M. (The prevalence of varicocele and varicocele related testicular atrophy in Turkish children and adolescents). BJU Int. 2000; 86: 490-3.
16. Pfeiffer D, Berger J, Schoop C, Tauber R. (A doppler based study on prevalence of varicocele in German Children.) Andrologia. 2006; 38(1): 13-19.
17. Mickenicius, R, Bosas, P. (Incidence of varicocele measured by ecoscopy.) Medicine (Kaunas). 2002; 38(Suppl 1): 66-8.
18. Ostler J. (Varicocele in children and adolescents: An invasive ligation of the incidence among Danish school children). Scand. J. urol. Nephrol. 1971; 5: 27.
19. WHO. Infertility: A tabulation of available data on the prevalence of primary and secondary infertility. Geneva: programme on maternal and child health and family planning. Division of family health. World Health Organization. (Accessed in May 2014, 5, at htt://apps. Who.int/iris/bitstream/10665/59769/I/WHO_MCH_91.9.pd?ua=1)
20. Sohrabvand F, Jafari M, Shariat M, Haghollahi F and Lotfi M. (Frequency and Epidemiologic Aspect of Male Infertility). Acta Medica Iranica, 2015; 53: 4.
21. Miyaoka R, Esteves, S C. (A Critical Appraisal on the role of Varicocele in Male Infertility). 2012; Adv Urol, 1(1): 1-9.
22. Brown J S. Varicocelectomy in subfertile men. In: Whitehead ED. Ed. Operative Urology, Philadelphia: Harper & Row. 1187-95.
23. Herzinger R. Physical examination in varicocele. In Jecht, E.W., Zeitler, E., eds. Varicocele and Male Infertility. Berlin: Springer Verlag: 1981.
24. Mali W P T H M, Oei H Y, Arndt J W, Kermer J, Coolsaet B L R A, Schur, K. Hemodynemics of varicocele. Part I. Correlation among the clinical, Phlebographic and

scintigraphic findings, Part II. Correlation among the renocaval pressure measurements, varicocelescintigraphy, and phlebography, J Urol., 1986; 135(3): 483-93.

25. Shafik A. (The cremasteric muscle. Role in varicocelogenesis and in thermoregulatory function of the testicle). Invest Urol., 1973; 11: 92-7.
26. El-Sadr A R, Mina E. (Anatomical and Surgical aspect in operative management of varicocele). Urol & Cutan Rev., 1950; 54: 257-62.
27. Anderson W. Male reproductive system. In: Anderson W, ed. Boyd's Pathology for the Surgeon. Philadelphia: Saunders: 1968; 442.
28. Weinerth J L. Varicocele. In: Sabiston DG, ed. Textbook of Surgery. Philadelphia: Saunders: 1986; 1680-1.
29. Comhaire, F., Zalata, A., Mahmoud, A., Depuydt, C. (1998): Pathophysiological effect of Varicocele treatment. *Urologe [A]*, 37: 251-253.
30. Sherins, R. J., Howards, S.S. (1986). Male infertility. In: Walsh PC, Gittes RF, Perlmutter AD, Stamey TA, eds. Campbell's Urology. Philadelphia: Saunders, 640-97.
31. Gorelick, J.I., Goldstein, M. (1993). Loss of fertility in men with varicocele, Fertil Steril. 59: 613-616.
32. Kass, E.J., Stork, B.R., Steinert, B.W. (2001): Varicocele in adolescence induces left and right testicular volume loss. BJU Int; 87: 499-501.
33. Greenspan, F.S., Gardner, D.G. (2004). Basic and clinical Endocrinology. Ed 7. New York, McGraw-Hill.
34. Daitch, J.A., Bedaiwy, M.A., Pasqualotto, E.B., Hendin, B.N., Hallak, J., Falcone, T., Thomas, A.J. Jr., Nelson, D.R., Agarwal, A. (2001). Varicocelectomy improves intrauterine insemination success rates in men with varicocele. *J Urol.* 165: 1510-1513.
35. World Health Organization. (1992). The influence of varicocele on parameters of fertility in a large group of men presenting to infertility clinics. Fertil Steril. 57: 1289-1293.