ASSOCIATION OF VARICOCELE WITH OLIGOSPERMIA AND AZOSPERMIA

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ABSTRACT

OBJECTIVE: To determine the frequency of abnormal semen parameters among patients presenting with varicocele

METHODS: It was a descriptive cross-sectional study conducted at the Department of Urology Institute of kidney diseases Hayat Abad Medical Complex Peshawar and Cenna hospital Saidu Sharif Swat. The study was carried out on 139 human subjects with clinical evidence of varicocele between age range of 15-45 years.

The diagnosis of varicocele was based on palpable and/or visible scrotal lump of testicular veins (pampiniform plexus) and was diagnosed on the basis of clinical examination. Semen analysis was carried out in all these patients and information was collected on pre designed proforma.

RESULTS: The study included a total of 139 patients with varicocele. The mean age of patient was 30 years (15-45) among the patients having symptoms of varicocele. The Mean $\pm$ SD for duration of varicocele symptoms was 9.32 ± 9.70 months. 6.5% (n=9) patients were having azoospermia and 20.1% (n=28) patients had oligozoospermia.

CONCLUSION: Patients with varicocele have poor seminal parameters in terms of sperm count i.e. oligozoospermia and azoospermia responsible for male factor infertility in majority of cases.

KEY WORDS: varicocele; seminal parameters; sperm count, infertility

INTRODUCTION

Varicocele is a condition of varicosity & tortuosity of pampiniform plexus and internal spermatic vein¹. The history of varicocele in literature dates back to 2nd century A.D when Celsus a Roman encyclopedist described varicocele as "the veins are swollen & twisted over the testis which becomes smaller than its fellow"².

The association between varicocele and infertility was recognized by T.S. Tulloch in 1952. He reported the association of varicocele and sperm count².

Epidemiological studies show that about 15% of all men have a clinical varicocele in general population^{3,4}. However 19-41% of patients evaluated for infertility are found to have varicoceles². Approximately 78-93% of the varicoceles are left sided⁵.

Varicoceles exist in different sizes regarding grading based on physical examination findings

and ultrasonographic features^{5,6}. The diagnosis is based on the WHO grading diagnostic criteria. Grade I is distinct dilatation of the internal spermatic vein palpable on standing during a Valsalva manoeuvre. Grade II is palpable vein when upright without a Valsalva manoeuvre. Grade III is vein both visible & palpable through the scrotal skin on standing without a Valsalva manoeuvre⁵. Varicoceles are diagnosed on history and clinical examination; however, Doppler ultrasonography is an important diagnostic tool for subclinical varicoceles⁶.

Many researchers have reported that the treatment of varicocele significantly improves semen parameters, pregnancy & birth rates⁷. Pain and discrepancy in testicular size in adolescents & abnormal semen parameters in adults associated with infertility, are the most common reasons for recommending varicocele correction^{8,9}.

There is documented evidence that varicocele significantly affects sperm parameters⁵ like count

,motility and morphology. Azoospermia has been reported to be 10 to 15% and severe oligospermia in 13.3% in subfertile men with varicocele^{10,11,12}.

Several theories regarding the deleterious effects of varicocele on sperm parameters have been put forward, which include factors such as reflux of toxic adrenal & renal metabolites through the renal vein, high intrascrotal temperatures, increased spermatozoic reactive oxygen species, and seminiferous tubular hypoxia due to venous stasis etc have been blamed for causing infertility in patients having varicocele^{1,7,13}.

MATERIAL AND METHODS

It was a descriptive cross-sectional study conducted at the Department of Urology Institute of kidney diseases Hayat Abad Medical Complex Peshawar and Cenna Hospital Saidu Sharif Swat the study was carried out on 139 human subjects with clinical evidence of varicocele. All men between age range of 15-45 years were included in the study.

The diagnosis of varicocele was based on palpable and/ or visible scrotal lump of testicular veins (pampiniform plexus) and was diagnosed on clinical examination. From all patients a sample of semen was obtained and immediately sent to hospital laboratory for the detection of abnormal semen sperm count (Azoospermia and Oligospermia). All the above mentioned information including name, age was recorded in a pre-designed Proforma.

Patients with a history of Prostatectomy, pelvic radiotherapy, testicular tumor, recent chemotherapy, and patients on alpha-blocker medication were excluded from the study. The diagnosis of varicocele was based on palpable and/or visible scrotal lump of testicular veins (pampiniform plexus) and was diagnosed on the basis of clinical examination.

All subjects were subjected to detailed history and clinical examinations. This was done to rule out confounders and possible bias in the study results. Data was analyzed and descriptive statistics were used to calculate mean and standard deviation for

age of patients and duration of symptoms. Frequencies and percentages were calculated for abnormal semen parameters (Azoospermia and Oligospermia).

RESULTS

Baseline characteristics:

The study included a total of one hundred & thirty nine (n=139) human subjects with varicocele. The age range was from 15- 45 years. Minimum age of patient was 15 years and maximum was 45 years among the patients having varicocele symptoms. The Mean±SD for age of varicocele patients was 30 6.71 years. Minimum duration of occurrence of varicocele was 1 month and maximum duration was 60 months (5years). The Mean ± SD for duration of varicocele symptoms was 9.32 ± 9.70 months. All patients included in the study were having clinically detectable varicoceles as Shown in table 1.

Sperm count:

The sperm count was evaluated in semen examination. 6.5% (n=9) cases had azoospermia (no sperms) and the remaining 93.5 % (n=130) patients were having no evidence of azoospermia. There was however oligospermia (sperm count of 20 million) in 20.1% (n=28) patients out of the remaining 79.9% (n=111 patients), as shown in table 2 & 3.

The frequency of abnormal semen parameters in patients with varicocele by age:

Abnormal semen parameters (azoospermia & oligospermia) when stratified among age of the patients the following results were obtained.

Azoospermia and Age: Among patients <25 years of age there was no single patient having azoospermia in our data, however between 26-30 years age range of patients azoospermia was reported in 6.1% (n=2) out of 33 cases, in 31-35 years age range of patients 2.7% (n=1) having azoospermia out of 37 cases and >36 years age range (36-45) of patients 20.0% (n=6) out of 30 cases were having azoospermia. Shown in table 4

Oligospermia and Age: Among patients <25

years of age 20.5 % (n=8) out of 39 patients were having oligospermia, between age range of 26-30 patients 18.2% (n=6) out of 33 patients having oligospermia and patients in the age range of 31-35 reported 27.0% (n=10) out of 37 cases in our data. And above 36 years age range (36-45) of patients 13.3% (n=4) out of 30 cases were having oligospermia. Shown in figure 1.

The frequency of abnormal semen parameters by duration of symptoms:

In patients evaluated for frequency of abnormal semen parameters when stratified by duration of symptoms, we got the following results.

Azoospermia & Duration of symptoms:

In patients having symptoms of <20 months duration 4.9% (n=6) of patients out of 123 were having azoospermia, in the range of 20-35 months duration of symptoms 40% (n=20) of patients reported azoospermia and in above 50 months duration of symptoms 100% (n=1) patient out of 1 case reported azoospermia as Shown in figure 2.

Oligospermia & Duration of symptoms:

Similarly in patients having symptoms of <20 months duration 19.5% (n=24) of patients out of 123 reported oligozoospermia, and between 20-35 months duration range of symptoms in 30.0% (n=3) out of 10 patients were having oligozoospermia during their routine semen examination. In 35-50 months duration range of symptoms 20.0% (n=1) out of 5 patients reported oligospermia, however in above 50 months duration of symptoms 0.0% (n=1) out of 1 case showing no evidence of oligospermia as Shown in table 1.

Table 01: Mean age and of varicocele duration

	N	Minimum	Maximum	Mean	Std. Deviation
Age of the patient	139	18.00	45.00	30.0791	6.71367
Duration of varicocele in months	139	1.00	60.00	9.3209	9.70772

Table 02: Frequency of azoospermia

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	9	6.5	6.5	6.5
No	130	93.5	93.5	100.0
Total	139	100.0	100.0	

Table 03: Frequency of oligozoospermia

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	28	20.1	20.1	20.1
No	111	79.9	79.9	100.0
Total	139	100.0	100.0	

Table No: 04 Frequency of Azospermia by age of the patients (in years)

		Azospermia		Total
		Yes	No	
Age of the (in Years)	<=25.00 Count	0	39	39
	% within age of the (in years)	0%	100.0%	100.0%
	26.00-30.00 Count	2	31	33
	% within age of the (in years)	6.1%	93.9%	100.0%
	31.00-35.00 Count	1	36	37
	% within age of the (in years)	2.7%	97.3%	100.0%
	36.00- Count	6	24	30
	% within age of the (in years)	20.0%	80.0%	100.0%
Total	Count	9	130	139
	% within age of the (in years)	6.5%	93.5%	100.0%

Fig. 1

Fig No 02

DISCUSSION

The present study was planned to investigate the deleterious effects of varicocele and the frequency of abnormal seminal parameters in patients with varicocele. We determined the semen status in terms of count in patients with varicoceles regales of grade of varicocele. A few local studies have demonstrated a relation between varicocele and sperm count. Our study has certain limitations particularly that we did not assess the frequency of other abnormal semen parameters like motility, morphology of sperms and the incidence of infertility among our study population.

Our study revealed azoospermia in 6.5%(n=9) and oligospermia in 20.1%(n=28) out of 139 patients with varicocele, which is showing contrasting results to a local study in terms of azoospermia and oligospermia which are 19.1% & 23.2% respectively. However the number of varicocele patients in their study was only 35¹⁴.

Esteves SC and Gina S published study in 2005 showed the association of varicocele with azoospermia in 5% cases which supports results of our study¹⁵.

Altug has reported 13 infertile patients who had complete azoospermia and clinical varicocele¹⁶. Papadimas J et al conducted a study regarding the association of varicocele and abnormal semen parameters leading to male factor infertility showed that varicocele was the cause of azoospermia in only 1.6% out of the 187 azoospermic men examined, substantiating the notion that varicocele causes azoospermia in few cases along with its association with other abnormal semen parameters like oligozoospermia, asthenozoospermia, and teratozoospermia¹⁷.

Similarly Macomber and Sanders in 1929 found a similar association of varicocele in an oligozoospermic subfertile patient who underwent varicocelecomy and became normozoospermic & subsequently fertile¹⁸.

As the number of published papers on this topic increases so does the controversy around the notion that varicocele is the cause of abnormal

semen parameters and infertility. There is still an ongoing debate among different researchers and clinicians as to if and to what extent varicocele affects semen parameters, which usually vary from normal to mild or moderate oligozoospermia, asthenozoospermia, teratozoospermia and even azoospermia in very few cases. In our study of 139 patients with varicocele only 20.1 % (n=28) showed oligozoospermia and 6.5%(n=9) reported azoospermia and the rest didn't reveal any abnormality in sperm count.

However some investigators have found contrary results regarding the effects of varicocele on abnormal semen parameters¹⁰ but to their disfavour they also included patients with subclinical varicoceles in their study and all our patients included were only having clinical evidence of varicocele.

MacLeod in his study carried out on the effect of varicocele on seminal cytology has reported out that of the 200 men with varicoceles¹⁹, 65% had a sperm count below 20 million/ml showing a contrasting result to that of our results in terms of oligozoospermia which was present in 20.1% patients.

Only few local studies are available on the subject and they have shown that significant improvement is noted in semen analysis of infertile patients after varicocelectomy,²⁰ further strengthening the cause and effect relationship between varicocele and abnormal semen parameters. This study is implicated on urologists, andrologists, surgical specialists, gyneacologists and other health professionals who come across with varicocele associated infertile patients.

There are some unanswered questions regarding the deleterious effects of varicocele on abnormal semen parameters as that why out of 139 patients some cases with varicocele suffered oligozoospermia in some how larger number of patients (n=28) and azoospermia in a very few cases (n=9) while the remaining others didn't reveal any abnormal reports at all. So further research is required to have an answer to these queries.

CONCLUSION & RECOMMENDATIONS

From our study, we hereby conclude that varicocele exerts adverse effects on sperm count and other semen parameters resulting in male socially demoralizing male infertility.

Future varicocele research should focus mainly on well designed, controlled clinical trials in well-characterized infertile patients, randomized to achieve conception as the primary outcome. Further research in the form of well-designed RCTs is also recommended to elucidate the exact pathophysiology of varicocele and its associated causes of poor semen quality which will hopefully lead to better selection of patients for the management of varicocele in future.

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