

Research Article

A study to evaluate the effect of hydrocoele on testis and spermatogenesis: a cross-sectional study from Bhopal, India

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ABSTRACT

Background: Hydrocoele fluid closely surrounds testes and by virtue of this, it is liable to cause some change in the external environment of testes. This can be in the form of increased pressure, increased temperature. This can ultimately result in the morphological alteration of testes, which in turn can affect spermatogenesis and steroid genesis.

Methods: It was a cross-sectional study conducted in the department of surgery, Peoples college of Medical Sciences and hospital, Bhopal. A total of 92 cases of unilateral scrotal hydrocoele were studied. Bilateral cases were excluded from the study.

Results: In our study, we found the association between the duration of hydrocoele with histopathological changes and impaired spermatogenesis is highly significant and also the association between size of hydrocoele with histopathological changes and impaired spermatogenesis is significant.

Conclusions: There are few variables which did not show significant association with impaired spermatogenesis in presence of hydrocoele were pain, fever, family history of hydrocoele, cord thickening, amber colour of fluid and lymphadenopathy. To sum up it would seem that big hydrocoele of long duration impair spermatogenesis and may lead to sub-fertility or infertility.

Keywords: Filariasis, Hydrocoele, Spermatogenesis, Testis

INTRODUCTION

Hydrocoele is the result of lymphatic obstruction either due to low grade inflammation of epididymis or due to trauma to the scrotum. However, hydrocoele in tropics has often been connected with filarial infection.^{1,2}

Hydrocoele fluid closely surrounds testes and by virtue of this, it is liable to cause some change in the external environment of testes. This can be in the form of increased pressure, increased temperature. This can ultimately result in the morphological alteration of testes,

which in turn can affect spermatogenesis and steroid genesis. At the same time changes due to primary cause leading to hydrocoele are also expected.

Scrotal hydrocoele can lead to alteration in the functional status of the testes up to such an extent that sterility or sub-fertility may result.³⁻⁸

METHODS

It was a cross-sectional study conducted in the department of surgery, Peoples college of Medical

Sciences and hospital, Bhopal 1, Bhopal. A total of 92 cases of unilateral scrotal hydrocoele were studied. Bilateral cases were excluded from the study. The age of the patients ranged from 20 – 45 yrs with minimum 2 yrs duration.

Detailed clinical history of patients was taken with special emphasis on history of trauma, filariasis and mumps. History of pain, fever and family history was also noted. Before undergoing surgery patient was investigated including routine hemogram – Hb, TLC, DLC, random blood sugar, serum creatinine and semen examination.

Scrotal ultrasound is suggested only for patients whose hydrocoele is large enough to prevent adequate palpation of the testes. Besides general and systemic examination thorough local examination was done specially noting the size and shape of hydrocoele, condition of the cord, regional lymph nodes and condition of the opposite cord, epididymis and testes.

During the surgery (which was performed under local anaesthesia) volume and colour of hydrocoele fluid was noted and tunica vaginalis, epididymis and testes were examined for any gross changes. Tunica vaginalis was examined with special reference to its thickness. Similarly testes were examined for any flattening alteration in size, shape, color of the surface etc. Similarly epididymal thickening if present was also noted. After examination of hydrocoele fluid a testicular biopsy was taken from the medial or lateral surface of upper pole of the testes through a 4mm incision in tunica albuginea. The extruded testicular tissue and a small portion of tunica albuginea were excised with scissors. A small piece of sac tissue was also taken in cases of

thickened or abnormal sac. A similar biopsy was taken from the opposite i.e. normal side which served as a control.

Ethical clearance

Informed consent was taken from all the subjects and ethical clearance was taken from institutional ethical committee.

RESULTS

Duration of hydrocoele

The majority of the patients presented when the duration of their disease was of 3-4 years with an average duration being 3.6 years. The maximum was of 96 months (8 years).

Size of hydrocoele

We have divided our patients into three groups clinically:

- Mild* – Vertical length up to 7.5 cm.
- Moderate* – Vertical dimension more than 7.5 cm. and less than 12.5 cm.
- Severe* – Vertical dimension more than 12.5 cm.

Filariasis and trauma

History suggestive of Filariasis was given by 15 patients and that of trauma was given by 11 patients i.e. 16.30% and 11.96% respectively. Testes could be palpated in mild hydrocoele and moderate hydrocoele. Thickened cord was palpable in 18 cases i.e. 19.57%.

Table 1: Association of size of hydrocoele with pathological changes and impaired spermatogenesis.

Size of hydrocoele	No. of patients	Histopathological changes	Impaired spermatogenesis
Mild (<7.5 cm)	6	2	0
Moderate (≥ 7.5 – <12.5 cm)	64	59	34
Severe (>12.5 cm)	22	22	19
Total	92	83	53

Table 2: Association of duration of hydrocoele with pathological changes and impaired spermatogenesis.

Duration (month)	No. of patients	Histopathological changes	Impaired spermatogenesis
24-48	61	53	30
49-72	18	17	12
73-96	13	13	11
Total	92	83	53

$X^2 = 4.24$ and $P < 0.05$ (Significant)

$X^2 = 16.54$ and $P < 0.001$ (Highly significant)

Thus the association between size of hydrocoele with histopathological changes and impaired spermatogenesis is significant.

$X^2 = 35.09$ and $P < 0.001$ (Highly significant)

$X^2 = 12.94$ and $P < 0.001$ (Highly significant)

Thus the association between the duration of hydrocoele with histopathological changes and impaired spermatogenesis is highly significant.

Table 3: Association of hydrocoele with various pathological variables.

No.	Variables	Chi square	P value
1.	Gross sac thickening	71.39	<0.001
2.	Epididymal thickening (gross)	13.98	<0.05
3.	Testicular shape change (Gross)	5.70	>0.05
4.	Microscopic sac thickening	151.20	<0.001
5.	Tunica albuginea thickening (Micro)	136.98	<0.001
6.	Basement membrane thickening (micro)	72.48	<0.001
7.	Interstitial fibrosis	63.27	<0.001
8.	Disorganization of seminiferous tubules	70.50	<0.001
9.	Impaired spermatogenesis	74.44	<0.001

Association of different pathological variables with impaired spermatogenesis in the presence of hydrocoele like gross sac thickening, gross epididymal thickening, gross testicular flattening and decrease in size, microscopic sac thickening, thickened T. albuginea, basement membrane thickening, interstitial fibrosis, disorganization and sloughing were found significant

with impaired spermatogenesis in the presence of hydrocoele (Table 3).

Those variables that did not show significant association with impaired spermatogenesis in the presence of hydrocoele were pain, fever, family history of hydrocoele, Thickening of spermatic cord, lymph node enlargement and amber colour of hydrocoele fluid. The association of these variables in absence of hydrocoele could not be assessed as none of the controls were positive for any other variables. Hence these rows have been omitted in the table.

DISCUSSION

Duration of disease varied from 24 months to 96 months (8 years), though majority of our patients presented to us within 5 years of the onset. According to Dedhia et al minimum duration recorded was 1 month and maximum was of 12 years and in the study by Singh et al duration varied from 12 months to 15 Years.^{9,10}

In our society, due to ignorance and illiteracy, people don't give much importance to their problem till it becomes an obstacle in their routine. Same is with hydrocoele, patients don't reach to the surgeon till it creates physical, or sexual hindrance, which is why sometimes they present even after 7 or 8 years of its onset. In the present study 9.25% cases presented between 7 - 8 years after the onset of disease.

It has been mentioned earlier that we have divided the patients on the basis of size into mild, moderate and severe. Majority (69.56%) of them were falling in moderate group, so most of them present only when the disease was really obvious to them and affecting their activity. According to literature hydrocoele in tropics has often been connected with filarial infection.² In our patients history suggestive of filariasis was found only in 16.30% cases. Most of them denied association of any fever with chills and rigor with hydrocoele swelling may be due to the sub-clinical filarial infection leading to hydrocoele.

Table 4: Comparison of various parameters of present study with other studies.

No.	Parameters	Dandapat et al ¹¹	Bhatnagar et al ¹²	Present study
1.	Thickening of Tunica Vaginalis	85%	84%	90.21%
2.	Thickened Tunica Albuginea	85%	85%	88.04%
3.	Basement membrane thickening	78%	25%	56.52%
4.	Interstitial fibrosis	85%	49%	53.26%
5.	Disorganization and sloughing	42%	55	43%
6.	Partial arrest of spermatogenesis	10%	42	39%
7.	Total arrest of spermatogenesis	8%	15	21%

Definite history of significant trauma was found in 11.96% of our patients. In literature trauma has been associated with hydrocoele.¹ Palpation of testes was possible in 71.73% cases which included all the cases with mild hydrocoele and most moderately sized hydrocoele. Clinically thickening of scrotal skin was found in 21.73% cases while cord thickening and epididymal thickening was seen in 19.57% and 14.13% respectively. Dandapat et al proposed that there is a direct relationship between duration of the hydrocoele and the larger its size, the greater the pressure effect and pathological change. They just proposed the relationship as a hypothesis.¹¹

The following table compares the percentage of various parameters in present study and other studies:

CONCLUSION

The variations are seen in some of the parameters e.g. interstitial fibrosis is seen in only 53.26% in our study compared to 85% in Dandapat series.¹¹ Similarly the incidence of partial and complete arrest of spermatogenesis was different from previous study.

In the present study 92 cases of unilateral hydrocoele of the tunica vaginalis testis were studied clinically, histopathologically and data was statistically analysed to ascertain the effect of hydrocoele on structure and function of the testes, taking the normal side as control. The variables which did not show significant association with impaired spermatogenesis in presence of hydrocoele were pain, fever, family history of hydrocoele, cord thickening, amber colour of fluid and lymphadenopathy. To sum up it would seem that big hydrocoele of long duration impair spermatogenesis and may lead to sub-fertility or infertility.

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Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

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