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Original article

Scrotal abnormalities and infertility in west African men: A comparison of fertile and sub-fertile men using scrotal ultrasonography



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KEYWORDS

Male infertility;
West African;
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Abstract

Objective: To determine and compare the spectrum of scrotal abnormalities in fertile and sub-fertile west African men using scrotal US.

Subjects and methods: The study examined 249 subjects over a period of 13 months. The subjects comprised 149 patients with diagnosis of male infertility, as well as 100 healthy individuals for comparison. The relevant clinical history of each patient was extracted from their case notes. All the subjects had their testes examined using a high frequency (7.5 MHz) linear transducer of an ultrasound scanner. Images in B-mode ultrasound scan and color Doppler were acquired in the supine and upright position. The results were expressed as percentages and tests of significance were done using the chi-square and Fisher's *t*-test. A *P*-value < 0.05 was considered statistically significant.

Results: The prevalence of abnormal scrotal findings in the sub-fertile and fertile men was 65.1% and 23% respectively (*P* < 0.01). Varicocele was the commonest and was found in 55% and 12% of the fertile and sub-fertile men respectively (*P* < 0.01). Hydrocele and epididymal abnormalities were the next common with higher prevalence in the sub-fertile men (*P* > 0.05), while testicular tumor was confirmed in one sub-fertile patient. With the exclusion of varicocele, there was no statistically significant difference in the prevalence of the other abnormalities between the sub-fertile and fertile groups.

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Conclusion: Male sub-fertility was associated with a higher prevalence of scrotal abnormalities. Apart from the diagnoses of the possible causes of the sub-fertility, routine scrotal US was able to diagnose other abnormalities of clinical relevance in the sub-fertile male. Scrotal US is a valuable tool in the evaluation of the sub-fertile west African man and should be considered in the routine evaluation of the sub-fertile west African man.

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Introduction

The male factor plays a role in approximately 50% of infertility cases [1,2]. This is commonly due to abnormalities in testicular function.

The role of ultrasonography in the evaluation of male infertility has expanded with advancements in this technology with scrotal ultrasonography (scrotal US) serving multiple purposes in the sub-fertile man. Apart from diagnosing the cause of the sub-fertility like varicoceles, it can also readily diagnose many other scrotal abnormalities not directly related to sub-fertility but which may be associated with morbidity like in the screening for testicular tumor due its reported higher incidence in patients with sub-fertility. Indeed scrotal abnormalities have been found on ultrasonography (USS) in 38–72% of infertile men [3–5].

While racial and geographical differences in testicular diseases do exist and the association of testicular abnormalities with infertility on scrotal US are well established, to the best of our knowledge there is no published data on the possible association of abnormal scrotal US findings with male infertility in sub-Saharan Africa. This is a prospective study that evaluated the spectrum of scrotal abnormalities in sub-fertile black West African men using scrotal US.

The objective of this study was to determine the spectrum of scrotal abnormalities in fertile and sub-fertile west African men using scrotal US.

Subjects and methods

The study was conducted at our medical institutions located in South West Nigeria, also comprising the commercial capital and the most cosmopolitan state in West Africa.

The study was done over a period of 13 months (December 2009–December 2010) in which 149 patients diagnosed with male infertility were studied. Main inclusion criteria for the subjects were a history of infertility of at least 2 years duration and at least two consecutive semen fluid analysis (SFA) showing a sperm density less than 20 million/ml of semen.

One hundred subjects with apparently normal fertility were recruited from among the hospital patients with unrelated problems for comparison. The main inclusion criteria for the fertile subjects were the absence of any history of fertility challenge and history of impregnation of sexual partner (confirmed either by appropriate pregnancy tests or with pregnancy carried to term) within the last 2 years.

Approval for the study was granted by the hospital research and ethics board and informed consent taken from all patients.

Assessment of the scrotal contents

Aloka Prosound SDD-3500 Plus, Japan 2005 scan machine with high resolution (7.5 MHz) was used. Images with B mode USS and colored Doppler were acquired in both the supine and erect positions.

The criteria for the diagnosis of varicocele were: (1) The largest plexus pampiniformis vein measured more than 2 mm in diameter in supine position or >3 mm in the standing position. (2) More than 1 mm increase in size of the largest vein during Valsalva on gray-scale examination. (3) More than 2-s retrograde flow during Valsalva maneuver on color Doppler US. A combination of 1 and 2 above or 1 and 3 above was regarded as diagnostic of varicocele [6]. The criterion for a thickened epididymis was a mean diameter of more than 12 mm in cross-section at the level of the caput [7] while an epididymal cyst was diagnosed by the presence of cysts (on the epididymis) that were hypoechoic and circumscribed with good through transmission and posterior wall enhancement [7,8]. A suspicion of testicular tumor was defined as the presence of focal hypoechoic lesion within the normally homogenous testis [7,8]. The presence of multiple, diffuse, non-shadowing hyperechoic foci was diagnosed as microlithiasis [7,8]. The presence of echo-free (or faintly echoic) collection of fluid in the tunica vaginalis (or surrounding the testis) was diagnosed as hydrocele [7,8].

All the scans were performed by two radiologists (OBO and AOY).

Semen collection and assessment

The semen was collected after a 3–4 days abstinence by masturbation, processed and analyzed using the 1999 WHO criteria [9].

Data analysis

- The results were expressed as percentages and tests of significance were done using the chi-square and Fisher's exact *t*-test. The paired *t*-test was used for the comparisons of the mean age. For the association between each abnormality and fertility status the Fisher's exact test was used while the chi-square was used for the overall associations. The chi-square was used for the association between the frequency of abnormality per patient and fertility status.

A *P*-value of less than 0.05 was considered statistically significant.

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