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Screening for obstruction of the vas deferens in Nigerian men with azoospermia using the α -glucosidase reaction in semen

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Summary

Obstruction of the vas deferens has been screened for, using the α -glucosidase reaction in seminal plasma as previously described by Comhaire.

Eighteen patients with azoospermia were studied. The result showed positive reaction in 17 patients (95.0%) and only a weak yellow reaction in 1 patient. The results did not corroborate the working hypothesis that the azoospermia was due to obstruction of the vas deferens. The implications of this findings in the management of male infertility in Nigeria are discussed.

Résumé

L'obstruction du canal de jèrènt 'etact soumis pour utiliser la réaction de α -glucosidase dans le liquide sèrninal commes ètait de 'crive' précédènt par Comhaire.

Les malades dixhuite avec azoospermie ètaient ètuchier. Le resultat montre les reactions positifs dans les malades dix- sept (95.0%) et un seal malade avec une reaction faible jaune.

Les resultats n'aient pas supporte's l'hypothese que L'azoospermie resultes de l'obstruction du canal dèjèrént.

Les implications de cette condition le traitement de l'infèrtilitè (male) en Nigeria sont èlaboré.

Introduction

Infertility is a world wide problem of continuing interest with the ultimate hope of improving available treatment modalities [1, 2, 3, 4]. Recent studies have shown that azoospermia was present in 6.52% [5] of the males attending a general infertility clinic and 35% [6] in a male infertility clinic. Despite this high prevalence, the causes of azoospermia such as failure of spermatogenesis and obstruction of the ducts sys-

tem particularly the vas deferens have not been well investigated [7]. If there is bilateral obstruction of the vas deferens, there will be absence of one or more of the chemical components of the ejaculate in addition to azoospermia.

α -glucosidase is an enzyme produced by the epididymis and released into the semen. The presence of this enzyme in the semen has been used to exclude bilateral obstruction of the vas deferens [8]. In vasectomised patients and cases with bilateral obstruction distal to the epididymis, the semen has a negative reaction for α -glucosidase [8]. We believe that if bilateral obstruction of the vas deferens was the cause of azoospermia in our patients, the results will not be different. We therefore, estimate the level of α -glucosidase in 18 Nigerian men with azoospermia with a view of assessing the role of bilateral ductal obstruction and offering additional treatment modalities.

Patients and methods

At the University College Hospital Ibadan, seminal fluid analysis forms an integral part of the routine evaluation of the male partner of an infertile union. Two semen samples are examined at least two weeks apart. Each sample is collected after 3 - 5 days abstinence by masturbation or coitus interruptus (if masturbation is not possible) into clean plastic or glass universal bottle and examined within one hour of ejaculation. From the general pool of patients, eighteen men with azoospermia were recruited for this study. Each produced a third sample at least two weeks from the second screening sample by masturbation and into a clean glass universal container. The masturbation was performed in a convenient section of the building in which the test was to be performed. The sample was allowed to stand at room temperature for about 30 minutes to allow for seminal liquefaction. α -glucosidase estimation was performed on each semen sample as follows:

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1. The semen sample was mixed well and 0.5 ml of it is added to 0.5 ml of physiological saline in a test tube.
2. After mixing adequately, 0.25 ml of the mixture was added to one tablet of α -glucosidase in a clean test tube which was then covered with a stopper. This was then mixed vigorously, or on a vortex mixer.
3. The mixture was incubated at 37°C for 4 hours.
4. The colour of the mixture was then read after incubation.
 - (a) Frank yellow colour indicates that α -glucosidase is present in semen and, therefore, no ductal obstruction.
 - (b) Unstained or weakly yellow mixture is considered negative indicating no (or very little) α -glucosidase in semen which implies obstruction anywhere along the duct system.

Results

The results of the study are summarised in Tables 1 and 2. Table 1 shows that 13, (72%) of the 18 patients studied gave past history suggestive of gonococcal urethritis. Eleven of these patients further gave history of self medication or treatment by non-medical personnel while the remaining four were treated with traditional preparations.

Table 2, shows that 17 (95%) of the 18 patients had a positive result of presence of α -glucosidase in the semen samples tested. The remaining one patient gave a weak yellow reaction which could not be interpreted as positive for the presence of α -glucosidase. This suggested the presence of ductal obstruction proximal to the epididymis or failure of

the epididymis to produce and/or release α -glucosidase into the ejaculate.

Table 2: Result of α -glucosidase reaction in semen samples of men with azoospermia at University College Hospital Ibadan, Nigeria

Result of Reaction	No.	%
Positive Reaction	17	95.0
Negative Reaction	1*	5.0

* (The reaction showed a weak yellow colouration and was interpreted as negative).

Discussion

The biochemical evaluation of the ejaculate remains an essential part of the full assessment of the male in an infertile union. Several characteristic components of the semen have been estimated in the ejaculate as a test for assessing testicular function or ductal patency. For instance the presence of zinc or citric acid, and fructose in semen have been so utilised in literature[9]. Their routine use in infertility evaluation have been limited by cumbersome methodology and non-standardization of results which make interpretation subjective[10]. More recently qualitative estimation of α -glucosidase in semen has been used to confirm bilateral obstruction of the vas deferens in vasectomised patients [8].

The results from this present study confirm the presence of α -glucosidase in 95% of a group of patients with azoospermia. This suggests that there was adequate ductal patency. However, this does not pre-

Table 1: Clinical characteristics of the men with azoospermia at University College Hospital Ibadan, Nigeria

Characteristics	No. (n = 18)
Age (Years)	
< 20	1
20 — 29	5
30 — 39	8
> 40	4
Type of Infertility	
Primary	0
Secondary	18
Past history of STD:	
Yes	13
No	5

clude the presence of unilateral block of the vas deferens or bilateral stricture which allows enough secretions into the ejaculate for a positive detection of α -glucosidase. The remaining patient gave a negative reaction for α -glucosidase. This suggests either bilateral occlusion of the vas deferens proximal to the epididymis or failure of epididymis production or secretion of α -glucosidase. In such a case ductal patency may be further assessed by vasography.

Because the presence of α -glucosidase in the semen is a proof that there is no bilateral obstruction of the vas deferens, it can be said that, the result of this indicates that the prevalence of bilateral obstruction of the ducts is low in Nigerian men with azoospermia. The inference from this is that azoospermia in these patients may be due to failure of spermatogenesis. This is however surprising in view of the fact that 72% of the eighteen patients studied gave past history suggestive of gonococcal urethritis. Sexually transmitted diseases and other infectious conditions are known to damage the vas deferens and cause occlusion, or permanently damage the seminiferous tubules leading to azoospermia [7, 12]. Such cases will require estimation of the circulating levels of follicle stimulation hormone, luteinizing hormone and testosterone although these hormones have also been found to be normal even in infertile males [6].

Thus it can be concluded that detection of α -glucosidase (like zinc, citric and or fructose estimation) can only be used as a screening test for ductal blockage. It, however, has some advantages over other biochemical estimations and these include simplicity of estimation which make it more applicable in Nigeria and other developing countries and the absolute information it gives when detected in semen.

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