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A case report of haematospermia associated with severe semen hyperviscosity

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ABSTRACT

This is case report on a 47 year old man with episodes of haematospermia and semen hyperviscosity. He was sent to the Medical Laboratory Services Department in ESUT Teaching Hospital Parklane, Enugu State for Laboratory diagnosis following evidence of infertility for 8 years. Clinical evaluation showed no pain, fever, dysuria or haematuria but semen analysis revealed severe hyperviscosity with thread length above 8cm and normal sperm count with 70% relatively active but sluggish spermatozoa, while semen and urethral swab culture yielded a heavy growth of Staphylococcus aureus that was sensitive to ceftriaxone and erythromycin. The patient was placed on IM ceftriaxone injection (1g) morning and night for two weeks and then re-examined for haematospermia after 4 weeks. The re-examination results showed normal semen viscosity with no blood in semen; suggesting that semen hyperviscosity with co-microbial infection may be an important determinant for fertility/infertility status in males.

Key words: Semen-Hyperviscosity, Haematospermia, Infertility, Ceftriaxone And Staphlococcus.

INTRODUCTION

Haematospermia is the presence of blood in the ejaculate which is usually a painless, benign, isolated, self-limiting symptom [1]. It is often a frightening finding for patients and the incidence of hematospermia is difficult to quantify because most men do not observe their semen [2,3]. Until recent decades, hematospermia was not considered clinically significant, and it was mostly attributed to prolonged sexual abstinence or intense sexual experiences because a precise aetiology could not be determined in as many as 70 percent of patients who presented with it [4,5,6]. Although prolonged sexual abstinence, excessive masturbation, and rigorous sexual intercourse are still considered causes of hematospermia [3]. However, of specific aetiologies, infectious conditions are the most common, accounting for approximately 40 percent of hematospermia cases[4,5]. Other aetiologies include inflammatory, neoplastic iatrogenic, structural, systemic, and vascular causes [7-9].

On the other hand semen hyperviscosity (SHV) is a condition that can seriously impair the physical and chemical characteristics of seminal fluid which has a serious impact on sperm function. SHV is associated with reduced sperm motility, possibly due to a 'trapping effect' that prevents normal sperm progression through the female genital tract [10,11]. Seminal hyperviscosity occurs in 12%– 29% of ejaculates [12] and it has been shown to have a negative impact of sperm motility and semen quality [13,11] as well as poor outcome with *in vitro* fertilization[14], leading to infertility in males.

The fluid secreted by the seminal vesicles make up the majority of the seminal plasma and is high in fructose [15], which provides the necessary energy for normal sperm function. Secretions from the prostate contain lipids, citric acid, proteolytic enzymes, zinc, and acid phosphatase, while the fluid secreted by the bulbourethral glands functions

as a lubricant for the urethra [16]. The testes contribute to the composition of semen by producing millions of spermatozoa, while the Sertoli cells secrete a quantity of fluid to act as a suspension medium and assist in the transport of sperm from the seminiferous tubules, after spermiation, through the different genital ducts [16]. Sometime after ejaculation, semen coagulates as a result of vesicular and epididymal proteins present in the seminal plasma [17,18].

Sperm gain motility, after being freed from the seminal clot by the action of proteolytic enzymes secreted by the seminal vesicles following liquefaction of the coagulum, approximately 20-30 minutes after ejaculation [19]. Semen that retains some of its viscous properties post-ejaculation, which does not change over time, can be regarded as hyperviscous [17]. In contrast to a partially liquefied sample, a viscous semen specimen exhibits homogeneous stickiness and its consistency will not change with time [16]. SHV can be recognized by the elastic properties of the sample, which adheres strongly to itself when attempts are made to pipette it [20]. The thread lengths of the semen drops can be measured on a centimeter scale in order to determine the grade of viscosity [21]. Men whose semen has a thread length between 2cm and 4cm are diagnosed with mild SHV; a thread length between 4cm and 6cm is labelled as moderate SHV; and a thread length greater than 6cm is diagnosed as severe SHV [21]. In a study performed by Elia and co-workers, it was shown that the prevalence of SHV was as high as 26.6% in males from infertile couples [21]. It was found that 13.1% of the men had mild SHV, while 6.6% of men had moderate SHV, with 6.4% of men diagnosed with severe SHV [21].

Case Presentation

A 47 year old man with haematospermia who observed the episodes of haematospermia in his ejaculation since two months was sent to Medical Laboratory Services Department in ESUT Teaching Hospital Parklane, Enugu State for Laboratory diagnosis. He had two children but for over 8 years after the last child the wife has not been able to conceive. He did not have penile pain, fever, dysuria or haematuria and abdominal pain but experiences libido, itching in the genital tract and urinary urgency. Semen analysis, semen culture, urine analysis, urine culture, urethral swab culture, prostate specific antigen (PSA), and serum electrolyte urea creatinine (serum e/u/c) were conducted to rule out possible causes of the haematospermia. Semen analysis revealed severe hyperviscosity with thread length above 8cm, 70% relatively active but sluggish spermatozoa, while semen and urethral swab culture yielded a heavy growth of Staphylococcus aureus that was sensitive to ceftriaxone and erythromycin. The urine analysis, urine culture, serum e/u/c and prostate specific antigen (PSA) test were normal. Base on these findings, the patient was placed IM ceftriaxone 1g injection morning and night for two weeks and then re-examination for haematospermia after 4 weeks. Re-examination result showed normal semen viscosity with no blood in semen.

DISCUSSION

The aetiology of hemospermia largely considered as idiopathic, has been reported in as many as 70% of all presenting cases with a variety of other less common causes [22]. Haematospermia may affect men of any age after puberty with its peak incidence in men aged 30 to 40 years old. The age ranges from 14 to 74 years, with an average age of late 30s which is in line with this case report [8]. Meanwhile in 30-70% of the cases, there is no association with any significant pathology [23].

Most of the semen comes from the seminal vesicles and prostate and infections or inflammation of these organs account for up to 50% of cases [8]. Malignancies and trauma account 4-13% of cases while prostate cancer account for 13.7% [8]. In 1991 D. J. Jones [24] did a prospective study of 74 men ranging in age from 20 to 73 presenting with hematospermia. In the group of patients less than 40- years-old (n = 65), no abnormalities were found in 31 (46%). Prostatitis was the most common cause and was found in 21 patients, followed by urethritis. Only one patient was found to have a serious problem of prostate cancer. Even among patients over 40-years-old (n=9) only one had prostate cancer.

Furthermore, hyperviscous semen produces impaired sperm motility as it affect kinetics parameters such as velocity, and the linear direction of sperm [25]. It creates a trapping effect due to the visco-elasticity of the seminal plasma that inhibits normal sperm motility [11, 10] especially in the female reproductive tract [13]. Studies have shown that the viscosity of seminal fluid affects the energy required by sperm to reach translational velocity [26]. In fact, literatures have revealed that impairment of semen constituent affects its morphology, viability, motility and fertility function of the spermatozoa. In the study by [14] sperm concentration, motility [13], vitality, and fructose concentrations were decreased in samples with high viscosity while [11] reported that seminal fructose levels were the only parameter to significantly predict hyperviscosity in semen samples [12]. As increased ATP content per sperm has been found in semen samples with higher viscosity when compared to samples with normal viscosity [27,28] it can point to the fact that normal sperm movement is impaired and ATP is not being consumed in hyperviscous semen [25,27].

SHV has been associated with poor semen quality, changes in chromatin stability, and decreased sperm count [13,28] which partially disagrees with our case report whereby the semen analysed present a normal sperm count. [28] Found that in semen samples with abnormal viscosity, sperm chromatin integrity was significantly lower when compared to controls with normal semen viscosity. The results from another study showed that semen with hyperviscosity exhibited high sperm chromatin stability, which is attributed to the presence of zinc-chelating agents [29]. These characteristics in SHV may be due to the fact that sperm chromatin stability depends on secretions of the prostate and seminal vesicles [30], including zinc chelators that reduce the zinc content in sperm chromatin [31]. A significant decrease in sperm count in men with SHV has been found which disagrees with this case report [28], while [32] reported a statistically significant positive correlation between zinc concentrations and sperm count.

Indeed SHV can lead to infertility in males through impairment of normal sperm movement and this finding is in line with this case report as the wife of the patient has not conceived [16]. SHV is caused by multiple contributing factors, such as infection, inflammation, leukocytospermia, hypofunction of the male sex accessory glands, oxidative stress (OS), and genetic factors [16]. It has been reported that bacteria culture-positive semen samples were more likely to be hyperviscous than non-positive samples [28]. This finding is in agreement with our case in question.

Of greater interest, is the fact that though many case reports of heamatospermia associated with malignant hypertension, Prostatic ductal adenocarcinoma and metastatic melanoma of the right seminal vesicle [33,34,35], there is dearth of information on case reports of haematospermia associated with severe hyperviscosity and co-staphlococcus aureus infection.

CONCLUSION

Overall, our findings suggest that semen hyperviscosity with co-microbial infection may be an important indicator for infertility status in males. Thus, Staphlococcus aureus infection should be considered as a differential diagnosis of hemospermia and semen hyperviscosity after common causes have been ruled out.

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