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AETIOLOGY, DIAGNOSIS AND MANAGEMENT OF HAEMOSPERMIA: A REVIEW
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AETIOLOGY, DIAGNOSIS AND MANAGEMENT OF HAEMOSPERMIA: A REVIEW

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ABSTRACT

Objective: **To provide an overview of the aetiology, investigations and the various treatment methods currently available in the management of haemospermia.**
***Data source*: Review of literature was effected through medline and index medicus search of major published indexed journals and books.**
Data selection: **Published data on haemospermia, hemospermia, haematospermia and semen over the last five decades (1967-2007) were utilised.**
Data extraction: **Abstracts of selected articles were read and analysed to determine their possible contribution and relevance to this article.**
***Data synthesis*: All relevant articles were reviewed in full and contribution extracted for this review as necessary.**
***Conclusion*: Haemospermia (haematospermia) is a relatively frequent, distressing and frightening symptom in sexually active men. It is usually a benign self-limiting condition resolving within several weeks except for the few with underlying aetiology including prostate malignancy and idiopathic. Patients presenting with haemospermia should have a detailed medical history, physical examillation including blood pressure measurement, genital and digital rectal examination. Persistent and recurrent haemospermia is best investigated by TRUS, CT, MRI, urethrocystoscopy, and biopsy and histological confirmation of malignancies. Specific treatment depends on the underlying pathological cause but often involves only minimal investigations and simple reassurance.**

INTRODUCTION

Haemospermia is defined as the macroscopic presence of blood in ejaculate (seminal fluid) and is not a very common urologic sysmptom representing only about 1% of urologic and andrologic symptoms (1,2). It is a very distressing and extremely alarming symptom in sexually active males. It is often perceived as a symptom of little significance by some but can cause great concern to men who experience it for the first time (3). Most patients with haemospermia therefore often need urgent medical advice early (4).

The cause of haemospermia is diverse and poorly understood but haemospermia commonly results from non-specific inflmmation of the urethra, prostate, seminal vesicles or bladder. Most men with haemospermia are young with a mean age of 37 years. Haemospermia almost always resolves spontaneously usually within several weeks and is only rarely associated with significant urological and andrological symptoms (5,6). Haemospermia arising from the prostate occurs in the initial portion of the ejaculate while that arising from seminal vesicles occurs in the later portion of the ejaculate. Patients with haemospermia that persist beyond several weeks should undergo further urologic evaluation to rule out specific underlying causes.

AETIOLOGY OF HAEMOSPERMIA

There are several unknown factors which cause haemospemia although the true prevalence remains unknown (7). Historically, haemospermia was linked to excessive sexual over indulgence, prolonged sexual abstinence or interrupted coitus (8). Classically haemospermia can be divided into two types: Those associated with genitourinary tract infection and those that are not associated with infection. In the later group however, the cause is often not found in most cases hence is usually considered idiopathic (4).

Aetiological factors in haemospermia are categorised into various pathophysiological mechanisms (9). Most causes of haemospermia are as a result of iatrogenic, inflamatory, infective, malignant and traumatic pathologies. Traumatic causes include calculi in the prostate and seminal vesicles (10). Specifically it may be commonly caused by none specific inflammation of the prostate gland, seminal vesicles and epididymis (11). Infectious and inflammatory lesions are known to account for most of the haemospermia in men under 30 years. Some of the infectious aetiologies of haemospermia include viruses such as herpes simplex virus (12), cytomegalovirus (13), bacterial, chlamydia trachomatis and ureaplasma (12) and parasitic (14).Urogenital infections and inflammatory disorders have been reported by others to account for 39-55% of the cases, urogenital malignancies and trauma accounts for just 4-13%. The remaining 11%, was caused by other pathological conditions. In 30-70%,of men with haemospermia there is no association with any significant pathology (8).

Haemospermia may be a manifestation of genitourinary malignancy and is common in older patients over 40 years of age (16,15). They form rare but significant cause of haemospermia and include cases of prostate, seminal vesicle, epididymal cancers and testicular (seminomas) (17-20). A literature review of aetiological studies on haemospermia reported a total of 33 tumours, 25 of them prostatic representing only 3.5% of all in one study by Ahmad and Krishna (20) and 0.5% in an earlier study involving a prostate cancer screening population (21). Haemospermia has also been reported to be associated with other malignancies such as lymphomas (22).

Haemospermia has also been reported to be associated with various systemic diseases. Some systemic diseases which have been associated with haemospermia include genitourinary tuberculosis (23,24), coagulation disorders (25,26), liver cirrhosis and haematological disorders and cytomegalovirus (8).

In genitourinary tuberculosis Yu *et al* (27) reported an 11% incidence after following up 65 patients for a period of ten years. Haemospermia has been reported in men with severe and uncontrolled hypertension (28-30), illustrating the urgent need to routinely measure blood pressure in all such patients during physical examination. Genitourinary schistosomiasis has also been significantly associated with haemospermia in young males (31-33). Heterotopic calcification as a cause of haemospermia was earlier reported by Sinokrot and Pryor in 1987 (34).

Haemospermia has been associated with vascular abnormalities which include venous varicosities of the seminal vesicles and prostatic urethra (35), congenital arterio venous malformations (3) and haemangiomas of the prostate, seminal vesicles, spermatic cord and urethra (36,37). Patients with intractable haemospermia and concomitant have presented with arterial bleeding as recently reported by Wang *et al* (38). Rodrigues *et al* (41) also recently reported monosymptomatic haemospermia associated with mullerian duct cyst.

Iatrogenic aetiologies generally without severity are due to recent developments of instrumental diagnosis and treatment (20). They form currently the most commonly seen causes of haemospermia and include transrectal ultrasound guided prostate biopsy for prostate cancer screening as the most common cause and transperineal prostate (39,40). Other causes include radiation therapy for prostate cancer, urethral instrumentation and urethra stent migration (20).

Haemospermia can also be caused by ductal obstruction and cyst formation. Reported cases include monosymptomatic cases associated with mullerian duct cyst (41), seminal vesicle cysts and utricular cysts (42,43). Other reported cases include ejaculatory duct obstruction and pseudocystic dilatation (44,45). Haemospermia has also been reported in patients with retrovesical hydatid disease (46).

DIAGNOSIS OF HAEMOSPERMIA

Haemospermia is rarely associated with significant pathology especially in younger men. Malignancy is generally rare but should be particularly considered in patients over 40 years of age. Recent advances in investigative modalities in the field of medical imaging particularly transrectal ultrasonography (TRUS), computer tomography (CT) and magnetic resonance imaging (MRI) have greatly contributed to the diagnostic approach to haemospermia and made it possible to confirm diagnosis in most cases

with underlying aetiology (47,48). Therefore with the current diagnostic modalities, the proportion of patients diagnosed with idiopathic haemospermia has decreased dramatically. The urologist's dilemma is now how far to investigate these patients since in the majority of them, haemospermia is a benign self-limiting symptom regressing spontaneously after the first episode (1,20).

The most significant factors for the correct diagnosis in haemospermia include a detailed medical history. The colour, quantity, frequency and the duration haemospermia is ascertained. It is also important to confirm whether the haemospermia is persistent and associated with other symptoms such as haematuria, weight loss, pain, lower urinary tract symptoms or sexual symptoms. A complete physical examination is mandatory to exclude pathological conditions that may cause the haemospermia. The examination should include taking the temperature and blood pressure, the abdomen for organomegally and the external genitalia. Digital rectal examination is performed to rule out rectal, prostatic and seminal vesicle pathology.

The initial investigations should include full screening for sexually transmitted infections (STI's). Other laboratory investigations should include full blood count, microscopic examination of white blood cells and count in semen, expressed prostatic secretions, urine after prostatic massage, and microscopy and culture of the first stream of urine, semen or expressed prostatic secretions (16, 48). Usually only a few patients will need further investigations which will depend on the nature of the findings in the patients medical history, physical examination as well as the nature of the haemospermia (47,49), although the most important factors that dictate the extent to which the evaluation can be carried are the patients age, the duration and recurrence of haemospermia and the presence of associated haematuria and other symptoms. It should therefore be possible to distinguish between idiopathic from secondary haemospermia in which the cause is known or suspected and therefore requires aetiologic treatment (1). The standard investigations of mid stream urine specimen microscopy culture, sensitivity and intravenous urography have been reported to be unhelpful by others (50).

When diagnosis remains unclear in persistent and recurrent causes of haemospermia, these are best further investigated by non-invasive imaging techniques such as transrectal ultrasonography of the prostate gland and seminal vesicles, computer tomography and magnetic resonance imaging which together or individually play a major role in detecting calculous, malignant or other diseases that cause haemospermia. Screening for genitourinary tuberculosis and schistosomiasis in patients should be carried out at this stage. Invasive urethrocystoscopy is recommended only if precise diagnosis has not been achieved (7,20,51). Prostate specific antigen (PSA) measurements should be undertaken in all patients over 40 years of age with persistent recurrent haemospermia after preliminary investigations (8).

Transrectal ultrasonography of the prostate gland and seminal vesicles (TRUS) is of particular value and should be performed mandatorily in all patients presenting with persistent or recurrent haemospermia. It is recommended as the first radiological investigation in these group of patients. The procedure can suggest and confirm causes of haemospermia without resorting to invasive investigations. It is a relatively inexpensive technique which shows real time coronal and saggital images with good resolution and without radiation exposure or prior preparation. It is specifically useful for the detection of calculi in the prostate, seminal vesicles and ejaculatory ducts. Transrectal ultrasonography is currently the most widely used worldwide with very accurate diagnostic rates of upto 95%. It should be considered as the definitive primary screening modality for patients with haemospermia. Soft tissue masses such as polyps and tumours may be actively delineated and measurements obtained accurately and can also exclude prostatic and seminal vesicle malignancy. However; where malignancy is suspected, confirmation must be effected through biopsy and subsequent histological examination (48,52-54). Transrectal ultrasonography of the prostate and seminal vesicles has also lead to confirmation of other causes of haemospermia such as the mullerian duct cyst (41). However transrectal and transperineal ultrasound guided biopsies of the prostate gland have been recently reported as a cause of haemospermia in some patients undergoing the procedures although the true incidence, duration and implications are not well established (39, 40).

Magnetic resonance imaging (MRI) can detect changes in anatomical structure to endocrine therapy, radiation, neoplastic and inflammatory disorders but its most significant advantage over transrectal ultrasonography is its ability to clearly reveal haemorrhages in the prostate or seminal vesicles. Magnetic resonance angiography may also produce additional information for localising bleeding in cases of persistent or recurrent haemospermia making it the current gold standard for imaging the accessory sex glands and their ducts

(55). Computer tomography (CT) has also been extremely useful and was recently reported to have confirmed the diagnosis of arteriovenous malformation with aneurysmal changes in the internal iliac vessels (3). Urethrocystoscopy is very useful in the diagnosis of urethral lesions such as polyps and haemangiomas (3).

Arterial bleeding in patients with intractable haemospermia and concomitant haematuria who were unresponsive to medical treatment was confirmed by pelvic angiography as a cause of haemospermia as recently reported by Wang *et al* (38).

TREATMENT OF HAEMOSPERMIA

The first step in the treatment of patients with haemospermia which does not resolve spontaneously within a few weeks involves careful talking to the patients. Such patients should be given a detailed explanation of their condition and the plan of management and follow up should be made very clear in order to avoid unnecessary anxiety. Treatment for haemospermia depends on the underlying pathological condition. In most cases however, the bleeding is only slight and self limiting and may be managed expectantly with minimal investigations and reassurance only (20,33). Patients with persistent or recurrent haemospermia, those with other associated symptoms such as haematuria, and patients who are above 40 years of age are usually referred to the urologist for further detailed investigations and treatment. Urologists in turn must make rational decisions based laboratory, imaging, endoscopy and histological evidence rather than defensive medicine. Understanding the pathophysiology and prevalence in populations of different ages helps to understand the problem and minimises problems associated with treatment (1).

Haemospermia resulting from infectious causes are usually treated with appropriate antibiotic, antiviral and antiparasitic agents indicated according to the sensitivity of the cultured organism. Only antibiotics that cross the prostate barrier by being secreted in prostatic fluid should be used. Full course tetracycline or metronidazole should be used in the treatment of chlamydia and bacteroides (51,54). In haemospermia from specific systemic aetiological causes, treatment is directed to the aetiological cause resulting in the cessation of haemospermia. Patients presenting with haemospermia alongside severe and uncontrolled hypertension undergo anti-hypertensive treatment resulting in the control of hypertension and resolution of haemospermia (28-30). In patients with confirmed genitourinary tuberculosis antituberculosis treatment is instituted with good results and cure from both TB and haemospermia (23,27). Genitourinary bilharziasis presenting with haemospermia is adequately treated with praziquatel resulting in resolution of haemospermia (31-33). Once haemospermia is confirmed to be due to prostatic cancer as evidenced by prostatic biopsy and histological examination, treatment should be directed towards prostate cancer resulting in the resolution of haemospermia (21,54).

Endoscopic marsupialisation of the mullerian duct cyst is indicated in symptomatic patients or those with complex cysts on transrectal ultrasonography resulting in very high improvement and cure rates in this group of patients without secondary effects (41). Endoscopic and laparoscopic excision of seminal vesicle cysts are effected successfully as well as the transurethral unroofing of cysts. Treatment for varicosities of the prostate, ectopic prostatic tissues, ejaculatory duct obstruction and intraurethral haemangiomas are effectively done by transurethral resection, diathermy fulguration, incision and dilatation. Cystic lesions of the prostate seminal vesicles, ejaculatory duct or embryological remnant may be treated with ultrasound or computer tomogram guided aspiration (4,56,57). Patients with haemospermia resulting from pelvic arteriovenous malformations with aneurysmal changes on pelvic computer tomography were treated with coil embolisation of the pelvic vessels with good results involving resolution of haemospermia (15). In intractable and recurrent haemospermia with concomitant haematuria resulting from arterial bleeding as detected on angiography, transcatheter arterial embolisation (TAE) has been successfully effected resulting in the cessation of bleeding, and resolution of haemospermia without complication of impotence (38). However, long term follow up is necessary because of possible reconstitution of blood flow from the opposite side. Routine treatment with massage by transrectal head rotating magnetic field have been reported to have remarkable therapeutic effects on obstinate (persistent and recurrent) haemospermia (58). Transurethral cautery (diathermy) has also been effected very successfully for haemospermia resulting from urethral haemangiomas diagnosed on cystourethroscopy (4).

CONCLUSION

Haemospermia (Haematospermia) is a relatively frequent, distressing and frightening symptom in sexually active men. It is usually a benign self-limiting

condition resolving within several weeks except for the few with underlying aetiology including genitourinary infections, prostate malignancy and idiopathic. Patients presenting with haemospermia should have a detailed medical history, physical examination including temperature and blood pressure measurement, genital and digital rectal examination. In younger men below 40 years of age, simple routine laboratory investigations should identify the pathology. Persistent and recurrent cases of haemospermia are best investigated by transrectal ultrasonography, computer tomography, urethrocystoscopy, magnetic resonance imaging and biopsy and histological confirmation of malignancies such as prostate.

Specific treatment depends on the underlying pathological cause but often involves only minimal investigations and simple reasurance in majority of patients. Haemospermia from genitourinary infection is effectively treated with antibiotics, antiviral and antiparasitic agents. Haemospermia secondary to genitourinary tuberculosis and severe and uncontrolled hypertension is treated satisfactorily with anti-TB and antihypertensive treatment respectively.

Haemospermia due to malignancies such as prostate, testicular and seminal vesicle cancers etc resolve through definitive treatment of the primary tumours.

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