

Penile Vibratory Stimulation for Semen Collection in Patients with Ejaculatory Disorders

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ABSTRACT

Background: Ejaculation is a complex physiological process that is mediated by interwoven neurological and hormonal pathways. Any interference with those pathways may cause a wide range of ejaculatory disorders including delayed ejaculation (DE) anejaculation or premature ejaculation. The aim of this study is to assess the efficacy of penile vibratory stimulation using a vibrator for semen collection in patients with DE or anejaculation for seminal fluid analysis or assisted reproductive technique. **Materials and Method:** The study was a combined retrospective and prospective study on which demographic information, risk factors for DE/anejaculation, history of prior ejaculation and outcome of vibration were all retrieved from the clinic register for the retrospective component; these were combined with those documented from the prospective component. All the Patients were trained on how to place and maintain the erect penis on the vibrator and stimulated for initially less than 30mins which may be extended to 60mins. The findings were recorded. **Results:** The age of the patients ranged between 23 to 89 years with a mean age of 39 ± 9.7 years. The risk factors for the DE among our patients were diabetes mellitus (28.1%), prolong penile stimulation requirement (24.5%) and spinal cord injury (19.3%) among others. Patients with lifelong (primary) DE accounted for 19.3% and acquired (Secondary) DE accounted for 80.7%. Following the procedure, the semen yield based on the duration of the vibratory stimulation (<30mins vs 30-60mins) was statistically significant ($P=0.0022$). **Conclusion:** The success of semen yield with PVS improves with increasing duration of vibratory stimulation and the procedure is largely safe in majority of the patients **Recommendation:** Penile Vibratory stimulation can be recommended for patients unable to produce semen for the purpose of conducting seminal fluid analysis (SFA) or use in assisted reproductive technique (ART).

KEYWORDS: Anejaculation, Delayed Ejaculation, Penile Vibratory Stimulation.

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INTRODUCTION

Ejaculation is a complex physiological process that is mediated by interwoven neurological and hormonal pathways. Any interference with those pathways may cause a wide range of ejaculatory disorders. The spectrum of ejaculation disorders includes premature ejaculation (PE), retarded or delayed ejaculation, anejaculation, painful ejaculation, retrograde ejaculation, anorgasmia and haemospermia.⁽¹⁾

The 3rd International Consultation on Sexual Medicine defined Delayed ejaculation (DE) as a persistent or recurrent difficulty, delay in, or absence of attaining orgasm after sufficient sexual stimulation, which causes personal distress.^(2,3) While the American Psychiatric Association in the Current diagnostic criteria from the Diagnostic and Statistical Manual of Mental Disorders, 5th edition, defines DE as either a marked delay in or a marked infrequency or absence of ejaculation on 75% to 100% of occasions for at least 6 months of partnered sexual activity without the individual desiring delay and causing significant distress to the individual.⁽²⁾ Anejaculation, is a complete absence of ejaculation and is considered as the severe form of DE.⁽³⁾ Therefore, the terminology DE aimed to describe all ejaculatory disorders that lead to a delay or absence of ejaculation.⁽⁴⁾ DE can be lifelong, acquired or situational.⁽⁵⁾

The 4th International Consultation on Sexual Medicine defined Lifelong (primary) DE as a lifelong experience or inability to ejaculate in all or almost all (75%-100%) occasions of coital activity, associated with distress. Voluntary cessation of coital activity may subsequently occur after a variable time to avoid frustration, physical exhaustion, or genital irritation of self or partner. Men with lifelong DE might or might not be able to achieve ejaculation by subsequent non-coital activity, including masturbation.^(2,5)

While Acquired (secondary) was defined as a distressing lengthening of ejaculatory latency that occurs in most (>50%) coital experiences after a period of normal ejaculatory function or a clinically meaningful change that results in distress. Voluntary

cessation of coital activity may subsequently occur after a variable time to avoid frustration, physical exhaustion, or genital irritation of self or partner.⁽⁵⁾

Ejaculation is triggered by integration of tactile (e.g., sensation from genital or other peripheral nerves) and non-tactile (e.g., sexually arousing audio and visual inputs) stimuli in the brain.⁽¹⁾ It consists of two distinct phases; Firstly, emission, a centrally-mediated action characterized by closure of the bladder neck and contraction of smooth muscles throughout the seminal tract (mediated by the sympathetic nervous system), which includes secretion of seminal fluid into the proximal urethra. The second phase is ejection, a reflex driven by the somatic nervous system, specifically the pudendal nerve, which is characterized by repeated contractions of the bulbospongiosus and ischiocavernosus muscles leading to forceful expulsion of seminal fluid from the urethral meatus.⁽²⁾ The act of ejaculation has important connotations for many men, aside from its association with orgasmic pleasure and necessity for procreation. Loss or anomaly of ejaculation may lead to a diminished sense of masculinity and disruption of pleasure from orgasm for many men. Delayed ejaculation is caused by the failure of semen emission from the seminal vesicles, prostate, and ejaculatory ducts into the urethra.⁽²⁾ True anejaculation is usually associated with a normal orgasmic sensation and is always associated with central or peripheral nervous system dysfunction or drugs.⁽¹⁾

There is a general agreement that low rates of DE are reported in the literature, it is the least common form of male sexual dysfunction. The prevalence of DE is reported to range from 1% for lifelong DE to 5% for acquired DE.^(3,4)

It may result from spinal cord injury, ejaculatory duct obstruction, retroperitoneal lymph node dissection, diabetes mellitus (DM), transverse myelitis, pelvic irradiation, multiple sclerosis, or psychogenic causes. The psychogenic causes include insufficient stimulation (mental and physical), performance anxiety, uncomfortable

environment, poor relationship factors and unusual masturbation techniques.⁽¹⁻⁵⁾

Treatments include sex therapy, vibrator stimulation, electro ejaculation, drugs and surgery.⁽⁶⁻⁹⁾ Penile vibratory stimulation (PVS) and electro-ejaculation are well-known techniques for semen collection.⁽⁸⁾ Penile vibratory stimulation evokes the ejaculation reflex, which requires an intact lumbo-sacral spinal cord segment; it is non-invasive and does not require any major equipment or technical assistance.⁽⁹⁻¹³⁾

Delayed ejaculation severely decreases the potentials of fertility in an individual; hence sperm retrieval in these individuals for the purpose of seminal fluid analysis (SFA) and assisted reproductive technique (ART) is paramount to the overall management of the patients.^(1,2) Sperm collection for these patients will improve their quality of life as they may be able to bear children.^(13, 14)

Very few studies have been conducted in Africa to establish the effectiveness of PVS for semen collection hence the motivation to conduct this study. The aim of the study was to determine the effectiveness of PVS using a vibrator for semen collection for SFA or ART.

MATERIALS AND METHOD

The study was a combined retrospective and prospective study to clinically assess the Effectiveness of PVS for Semen Collection in Patients with DE/anejaculation who presented to our hospital from January 2017 to June 2024. The subjects were all consenting Patients with DE or anejaculation of various aetiologies who presented to our hospital. Patients excluded from this study were those with established obstruction as a cause of anejaculation and retrograde ejaculation.

For the retrospective component of the study, data on the patients' demographic information, risk factors for DE/anejaculation, history of prior ejaculation (intercourse, masturbation, and wet dreams), psychogenic assessment, history of drugs and concoction use, spontaneous or induced erection, PVS findings (type of stimulator used, duration of stimulation, semen expulsion and complications) were all retrieved from the register at

the clinic that was kept since commencement of the therapy. These were combined with the findings from the prospective component.

All patients were initially counseled on the modality of procedure, rationale behind it, it's working, duration of stimulation and possible complications; these are contained in patient information sheet. Before beginning the session for each patient, materials needed were made available; these include vibrator, Bimix (papaverine + chlorpromazine), injection phenylephrine, semen collection sample bottle, 1ml syringes, gloves, methylated spirit and dry cotton wools etc.

Each patient was given tabs tadalafil 20mg to ingest 1hr before the planned procedure. At the commencement of the procedure, in a private procedure room each patient was stimulated to have an erection by being asked to fantasize with or without watching a porn. Where a patient was unable to have an erection, or couldn't take the tadalafil, he then had intracavernous bimix (papaverine + chlorpromazine) 0.5-1ml to induce erection. Patient was then trained on how to place and maintain the erect penis on the vibrator and stimulated for initially less than 30mins (5- 29mins) and if not successful then extended to 30-60mins [Fig IV and V]. A semen collecting container was made available to the patient for semen collection. Where the first session did not yield semen, this procedure was repeated at another time following same routine.

The information obtained were entered into Excel sheets, refined, grouped and then transferred into SPSS Version 21 and analyzed. Chi squared test was used to assess significance of association. Differences were considered statistically significant where p-value was less than 0.05 ($p < 0.05$).

The ethical approval for the conduct of the study was obtained from the Research Ethics Committee (REC) of the hospital with the reference no- NHREC/28/01/2020/AKTH/EC/3692. Patients signed informed consent.

RESULTS

A total of 57 patients were recruited into the study including 45 whose records were retrieved and

reviewed retrospectively and the 12 treated prospectively.

The age distribution of the patients is as shown in Fig 1, age ranged between 23 to 89 years with a mean age of 39 ± 9.7 years.

The risk factors for the DE/ anejaculation found among our patients are shown in Table I, with DM being the commonest risk factor. In addition, the patients were grouped based on their type of DE (according to classification by The 4th International Consultation on Sexual Medicine) into lifelong (primary) DE accounting for 19.3% and acquired (Secondary) DE accounting for 80.7%.

In 40.4% of the patients, an adopted massager (Fig V) was used for the vibration, this was at the early years of the practice when it was the only available vibrator in the clinic, it was substituted by a vibrect-X3 (Fig IV) in the later years and used in 59.6% of the patients.

Following the procedure, the semen yield among the patients was compared based on the type of vibrator used and the duration of the vibratory stimulation. In terms of the semen yield, no statistically significant difference was found based on the type of vibrator (Massager vs vibrect-X3) used as shown in Table II, however, the duration of the vibratory stimulation (<30mins vs 30-60mins) was statistically significant (Table III).

Few complications were recorded in all the patients while the majority had none (Fig III).

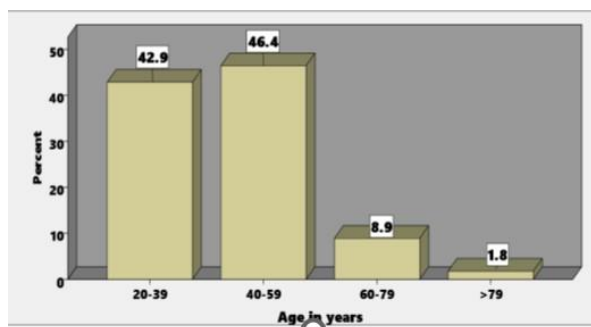


Figure 1: Age Distribution of the patients.

Majority of the patients were married (Fig II)

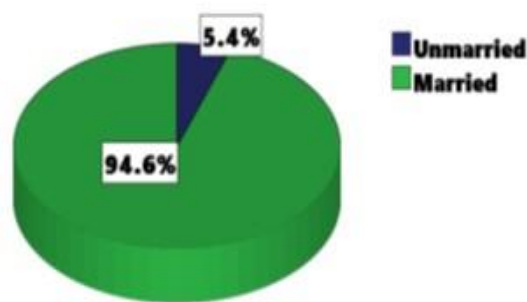


Figure II: Marital Status of the Patients.

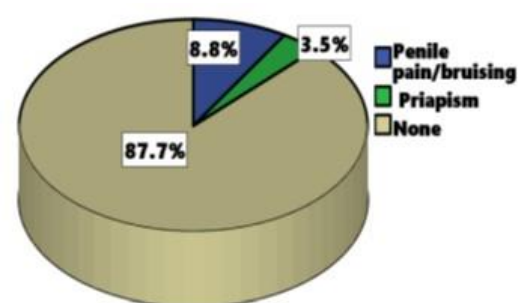


Figure III: Complications of Penile Vibratory Stimulation



Figure IV: Vibration with a Vibrect-X3.



Figure V: Vibration with an adopted massager.

Table I: Risk Factors for Delayed Ejaculatory/Anejaculation

Risk Factor	Frequency	Percent
Diabetes Mellitus	16	28.1
Spinal cord compression/Injury	11	19.3
Anxiety	9	15.8
Uncomfortable Environment	7	12.3
Prolong Penile Stimulation Requirement	14	24.5
Total	57	100.0

Table II: Semen Yield Based on Type of Vibrator Used.

Vibrator Type	Frequency (semen production)			Cumulative freq/percent
	None	<1.5mls	>1.5mls	
Vibrect-X3	11	5	18	34(59.6)
Massager	10	5	8	23(40.4)
Total	21	10	26	57(100.0)

Chi square value= 1.87 P= 0.39

Table III: Semen Yield Based on Duration of Vibratory Stimulation

Duration of vibration	Frequency (semen production)			Cumulative freq/percent
	None	<1.5mls	>1.5mls	
<30mins	15	4	5	24(42.1)
30-60mins	6	9	18	33(57.9)
Total	21	13	23	57(100.0)

Chi square value= 12.17 P= 0.0022

DISCUSSION

Ejaculation represents the climax of the sexual cycle, its occurrence in an individual signals successful completion of the sexual cycle. Ejaculation has both psychological and reproductive significance; DE (including anejaculation) has tremendous negative effect on both the psychosexual and reproductive function of the individual. From this study, patients' age range (23 to 89 years) and mean age (39 ± 9.7 years), indicates the age individuals began to be worried about their ejaculatory function which affect their ability to impregnate their partners. In the few reported cases of DE/anejaculation, most patients were also of young age.^(8,9,14) Majority of the patients were married, this is also expected as regular intercourse and strong stimulation is required to ascertained individuals' capabilities to ejaculate. Several possible risk factors for DE have been documented in previous articles,^(1,2,3,5) from this study, DM, spinal cord injury (SCI) and anxiety were frequent among our patients and this is similar to previous reports, however, a significant percentage of them (24.5%) had none of the known risk factors but that they required long penile stimulation to ejaculate. The pathophysiologic explanation of DE/ anejaculation in patients with DM and SCI has been fully documented in earlier reports,^(4, 12) however the explanation in other rare cases require further elucidation of the processes involved. Most of the patients attended to in this study had earlier ejaculated and might ejaculate in some situation (acquired). These patients might have been ejaculating prior to onset of their disease condition (as in SCI) or would have ejaculated in a more secure and comfortable environment. In some, the DE results from consequences of long standing disease (as in DM). Similar findings were reported in other studies.^(4,8,12)

Penile vibratory stimulation remains a first-line, simple, effective and safe option for inducing ejaculation in patients with DE (particularly those with SCI), in this study, PVS was tested in patients with various risk factors for DE, using 2 different types of vibrators and extending duration of vibration in order to improve effectiveness. No statistically significant difference between using an

adopted massager and a Vibrect-x3 in terms of semen yield (p value- 0.39), however, extending the duration of vibration to up to between 30 to 60mins is statistically significant (p value- 0.0022) in improving the chances of ejaculation when compared to shorter duration of vibration (< 30mins). This might be explained by the fact that stronger and longer duration of penile stimulation has been shown to improve attainment of orgasm (and eventual ejaculation) in some patients.^(3,5)

Penile vibratory stimulation has been found to be safe in majority of our patients with only few reports of priapism following inducing erection and mild penile bruises, PVS has been reported generally as a safe procedure with no significant complications^{10, 11,12} as the procedure employed the use of simple technology with safety measures being observed.

CONCLUSION

Penile Vibratory stimulation for patients with DE/anejaculation is an important adjunct in the general management of patients with DE which can be used to induce ejaculation for use in SFA and ART. The success of semen yield with PVS improves with increasing duration of vibratory stimulation and the procedure is largely safe in majority of the patients.

RECOMMENDATION

Penile Vibratory stimulation can be recommended for semen collection in patients unable to produce semen for the purpose of SFA or use in ART.

Limitations: Being a rare disorder, the sample size is small, hence a bigger sample size, wider coverage is needed in subsequent study in order to generalize findings.

Conflict of Interest: No conflict of interest. The researcher has no affiliation to any of the companies whose products were used in the course of this study.

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