



Male bulbourethral gland secretions as physiological lubricant for vaginal dryness - A pilot study

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Abstract

Background: Vaginal dryness is common during and after menopause due to declining oestrogen, vulvovaginal atrophy (VVA), up to about a year after delivery during breast feeding and in many other conditions. This can be distressing to painful for women and may cause discomfort and dyspareunia. This study was performed to evaluate the use and practicability of secretions of male bulbourethral glands (Cowper's glands) to alleviate the discomfort, dyspareunia or pain at sexual activity, because of inadequate lubrication of vagina.

Method: When a healthy male is sexually aroused, Cowper's glands produce a mucous-like fluid called pre-ejaculate. This fluid is a clear, colourless, viscous, and salty liquid, which is emitted from the urethra of the penis. A lubrication free wet condom on penis during foreplay can prevent loss of these secretions during an extended foreplay and lubrication around penis due to these secretions can effectively serve as physiological lubricant during coitus.

Result: This technique and secretion of Cowper's glands are a good lubrication for dryness of vagina during coitus. Sexual function assessment revealed a marked improvement in all domains of sexual function to both partners. A physiological secretion being natural to the sexual act and providing motive for extending foreplay; it is arguably the best lubricant for coitus in situations of dry vagina.

Conclusion: Supposedly the secretions may also help in reducing dose of HRT for menopause, extended foreplay adds to psychosexual benefits and a boost to sexual hormonal milieu.

Keywords: female sexual function index; lubrication free dry condom; lubrication free wet condom; secretions of male Cowper's glands

Introduction

WHO defines sexual health as "a state of physical, emotional, mental and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence. For sexual health to be attained and maintained, the sexual rights of all persons must be respected, protected and fulfilled".

Vaginal dryness is common during and after menopause due to declining oestrogen, up to about a year after delivery during breast feeding, due to smoking, vaginal nulliparity, vulvovaginal atrophy (VVA), very low-dose combined oral contraceptive (COC) and/or progesterone-only methods, medications to decrease oestrogen levels, some health conditions and other

potential contact and irritant factors to the vaginal mucosa, resembling symptoms of atrophic vaginitis. This can be distressing to painful for women and may cause discomfort and dyspareunia. Coitus, in inadequate lubrication, also carries potentials for frictional damage to vaginal mucosa and consequent change in vaginal

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flora and pH. Oestrogen replacement has been used to relieve symptoms, but these are contraindicated in some patients, have potentials for side effects and may not be acceptable by some users. Vaginal lubricants and moisturizers are commonly available remedies over the counter and help relieving the symptoms of dry vagina and VVA. However, their chemical composition varies enormously and some are known to cause detrimental effects due to unphysiological pH, osmolality, and additives.

Secretions of male Cowper's glands (SMCG), during sexual arousal, are physiological secretions which lubricate male urethra. Normally these secretions remain confined to urethra or are lost during foreplay and are not required specifically for lubrication during sexual intercourse as there is adequate lubrication in vestibule and vagina of a healthy aroused female. But in cases of women suffering from dry vagina of various degrees and because of different reasons; coitus may not be as pleasant as it should be, or may be associated with discomfort. Normally SMCG may contribute to physiological lubrication, but using these secretions for women suffering from decreased vaginal lubrication and lubricating penis with SMCG by using lubrication free wet condom (LFWC) during sexual act has neither yet been reported in literature, nor is there any evidence of these been tried previously.

The aim of this study was to evaluate the use and practicability of SMCG in discomfort or pain at sexual activity, because of dryness of vagina. When a healthy male is sexually aroused, Cowper's glands produce a mucous-like fluid called pre-ejaculate. This fluid is a clear, colourless, viscous, and salty liquid, which is emitted from the urethra of the penis. Its purpose is to lubricate male urethra and to neutralize any residual acidity in the urethra, resulting in it being more hospitable for the sperm to travel in.

Material and methods

This prospective pilot study was carried out in the Departments of General Surgery and Gynaecology; G S medical college, Pilkhuwa District, Hapur, Uttar Pradesh state of India. Informed consent was taken from all patients. All patients found to have vaginal dryness causing coital discomfort or dyspareunia attending OPD for 6 months starting from January 20th, 2022 were included in this study and were assessed for sexual health issues and associated risk factors. Husbands were explained the process in detail and were counselled to use lubrication free wet condom (LFWC). Approval for this study was received from institutional ethics committee vide certificate number GSMCH/2022/IEC/011 dated 18/01/2022.

Inclusion criteria

Woman attending gynaecological and surgical outpatient department (OPD) with loss of libido, complaints of dyspareunia, or sexual health, were included in this study. They were interviewed on their sexual health and her recent sexual activity and were examined physically. The women had to be in a stable and sexually active relationship with their husbands. Vaginal dryness was identified by the contemporaneous presence of a pH >5, subjective vaginal dryness and an objective sign of vaginal dryness.

The interviews to collect information about sexual activity and relationship with partner were conducted. All of them voluntarily agreed to fill in a simplified 6 domain female sexual function questionnaire and provide data on weight, height, hormone treatments, the age of menarche and sexual initiation. Six domains of female sexual function included were desire, subjective arousal, lubrication, orgasm, satisfaction, and pain. The self-administered or assisted filling of forms in cases of illiterates, was used to assess sexual function. Original Female Sexual Function Index (FSFI) [1] consists of nineteen items in six domains, which include desire (two items), arousal (four items), lubrication (four items), orgasm (three items), satisfaction (three items) and pain (three items); answered on a five point likert scale, ranging from 1 (never/very low) to 5 (always/very high). The total score range is 2–36. A cut off of 26 is usually accepted for diagnosis of sexual dysfunction in women within a wide age range. An accurate validated version of FSFI in Hindi, which could be clearly understood by women included in this study; is not available in literature. Moreover 19 point FSFI was found to be impracticable in our population because of illiteracy, inhibitions about sexual discussion, ignorance of detailed sexual perceptions, male dominance in sexual matters and inadequate availability of Hindi vocabulary for this purpose. Translation of detailed sexual terms in Hindi was also not done for same reasons. In this study we used a simplified assessment of female sexual function considering the inhibitions of women in our population. We included one question for each domain of female sexual function of desire, subjective arousal, lubrication, orgasm, satisfaction, and pain.

Exclusion criteria

Women affected by medical co-morbidities such as major psychiatric illness, acute renal, liver, cardiovascular disease or any other acute major illness that could impair overall health and well-being, gynaecological surgery, active malignancy, or cancer treatment, were excluded. Unmarried, divorcee and women above 70 years of age were not included. Women having evidence

of vaginal infection or unhealthy discharge per vagina, causing discomfort during coitus, were also excluded from this study. The couples in which male members had some element of erectile dysfunction or psychological problems were also excluded.

Intervention

The couples were counselled to lubricate penis with SMCG by using LFWC during sexual arousal. Male members were asked to wear LFWC before the starting the foreplay. The amount of SMCG is proportional to male arousal and duration of foreplay. Foreplay is extended till whole of penis is adequately wet with SMCG. At this stage after removing condom, penis adequately lubricated with these secretions, has appropriate lubrication for comfortable or sensuous coitus.

Normally condom carries a lubricant which is not natural and unsuitable for this intervention. Condom was thoroughly washed to remove this lubrication. Alternatively a non lubricated dry condom can be used. If pregnancy is not required than a fresh washed wet condom can be used. In that case the water has to be fully drained out of condom. Wet condom reduces the duration of foreplay but theoretically pH of water may be inappropriate for sperms. It can then be put on penis before starting foreplay. All couples were counselled to sufficiently prolong the foreplay so as to have adequate lubrication around the whole penis and not just around the glans penis. This required a little redistribution of secretions around whole of penis by manual manipulations. The viscosity of these secretions is sufficient to act as lubricant for dry vagina. The condom is then removed and coitus with thus lubricated penis possibly has the potential to prevent discomfort of dry vagina and make it pleasant and sensuous. If condom is also to be used to prevent pregnancy, then it was put in again during the coitus whenever convenient. Normally putting condom again is not required as vaginal dryness is experienced more in peri-menopausal age group. If it is being practiced during breast feeding period and no other contraception is being used, then it will require this precaution. Same condom can also be washed and reused or a new condom can be unfolded and washed. Since lubrication provided by SMCG is absolutely physiological, naturally available in given circumstances and incurs no costs, it is arguably the best available lubricant for dry vagina. If pregnancy is desired, then lubrication free dry condom (LFDC) would be better choice to avoid chemicals in tap water. Adequate lubrication in dry condom required a little longer foreplay as compared LFWC.

Couples were further counselled that increased duration of foreplay prolonged the pleasant sensations

for the couple. It has the added advantage of prolonging positive physiological stimuli to promote good hormones secretion in women with dry vagina.

Statistical method

Data thus gathered was analysed using SPSS software version 20. Statistical test of significance (t-test and chi-square test) was applied wherever found necessary ($p < 0.05$ was considered statistically significant).

Results

210 couples were included in this study who attended surgery and gynaecological OPD from January 20, 2022 to July 20, 2022 (Table 1). In this study 30.9% of the couples were of 22-29 years of age, 17.1% were 30 to 34 and 43.4% were of 35 to 50 and 8.6% were more than 50 years of age. Many of the younger couples were from 6 months to one year after the delivery. At the time of inclusion, out of 86 post delivery women 60.5% women were within 6 months of post delivery and 39.5% were within 6 months to one year of post delivery. As is clear vaginal dryness was experienced in higher percentage in early post delivery period as compared to more than 6 month post delivery. 11% were underweight, 50.5% were ideal weight, 13.8% were overweight and 24.7% were obese. 22.4% were illiterate, 51.9% were under matriculation, 17.1% were graduate and 8.6% were postgraduate.

Table 1: Demographic data of females (n=210).

<i>Age Group</i>	22-29	65	30.9%
	30-34	36	17.1%
	35-50	91	43.4%
	50+ years	18	8.6%
Post delivery breast feeding period (n=86)	6 months (Breast feeding)	52/86	60.5%
	12 months (Breast feeding)	34/86	39.5%
Body mass index group	Underweight	23	11%
	Ideal	106	50.5%
	Overweight	29	13.8%
	Obese	52	24.7%
Education of female	Illiterate	47	22.4%
	Under matriculation	109	51.9%
	Graduate	36	17.1%
Menopause status	Postgraduate	18	8.6%
	Reproductive age group	142	67.6%
	Menopausal age group	68	32.4%
Religion	Hindu	118	56.2%
	Muslim	92	43.8%
Perception of body image	Always satisfied	104	49.5%
	Sometimes satisfied	68	32.4%
	Never satisfied	38	18.1%

38.6% revealed dyspareunia and attended OPD with this as dominant presentation (Table 2). 52.4% of women revealed loss of interest in sex, though none of the women preferred to refuse the sexual act initiated by males. 47.1% women revealed lack of lubrication only.

Table 2: Dyspareunia and loss of interest in sex along with dryness of vagina.

Dyspareunia/discomfort during coitus	81/210	38.6%
Loss of interest in sexual activity	111/210	52.4%
Only lack of vaginal lubrication	99/210	47.1%

87.6% of males could practice this intervention easily, 8.6% expressed difficulty in able to sustain erection for adequate time to have sufficient lubrication and 3.8% could not successfully practice this intervention (Table 3). 15.3% expressed extreme satisfaction, 72.4% were very satisfied, 5.2% moderately, 3.3% a little and 3.8% were not at all satisfied.

Table 3: Demographic and study data of males data (n=210).

Domain	Group	Number	Percentage
Age	22 -29	68	32.4%
	30-34	43	20.5%
	35-50	91	43.3%
	50+ years	8	3.8%
Body mass index	Underweight	18	8.6%
	Ideal	79	37.6%
	Overweight	37	17.6%
	Obese	76	36.2%
Education	Illiterate	32	15.2%
	Under matriculation	142	67.6%
	Graduate	21	10%
	Postgraduate	15	7.2%
Ease with intervention could be used	Easily	184	87.6%
	Difficult to maintain erection for that long	18	8.6%
	Could not perform	8	3.8%
Likert scale satisfaction score	5 extremely satisfied	32	15.3%
	4 very satisfied	152	72.4%
	3 moderately satisfied	11	5.2%
	2 a little satisfied	7	3.3%
	1 not at all satisfied	8	3.8%

As is clear from table 4 sexual function assessment revealed a statistically significant improvement in all six domains of sexual function.

Table 4: Five point female sexual function scores before and after intervention n (210) on 5 point likert scale. 1 not at all satisfied, 2 A little satisfied, 3 moderately satisfied, 4 very satisfied, 5 extremely satisfied.

Domain	Before intervention		After intervention		P value
	Mean	SD	Mean	SD	
Desire	3.3	1.62	3.9	1.80	0.0004
Arousal	2.94	1.45	3.36	1.52	0.0040
Orgasm	2.23	1.43	2.94	1.50	<0.0001
Pain	1.34	1.08	.86	0.74	< 0.0001
Lubrication	2.54	1.53	3.84	1.89	< 0.0001
Satisfaction	2.84	1.34	3.92	1.57	< 0.0001

Discussion

A central aspect of being human is to have good sexual health. Good sexual health is fundamental to the overall health and well-being of individuals, couples and families and to the social and economic development of communities and countries. WHO is committed to identifying and promoting sexual health itself, so that everyone everywhere is able to fulfil their human rights related to their sexuality and sexual wellbeing.

Leiblum et al [2] noted that women from different countries differ substantially, ranging from 5.8% to 19.7%, in their experiences, concerns, reports of vaginal dryness or sexual pain and as well as their familiarity with personal lubricants as a treatment. The study emphasized that researchers should assess the prevalence and degree of the bother of vaginal dryness in order to make international comparisons of the burden of this condition. As is clear from our study that breast feeding and perimenopausal periods along with other co-morbidities constitute a significant percentage of women's life likely to have vaginal dryness. Cordeau and Courtois described that perimenopausal period, breastfeeding, stress, underlying conditions such as diabetes, inflammatory bowel disease, chronic heart failure, hypothalamic amenorrhea, and hyperprolactinemia, can all cause vaginal dryness [3]. That study noted that symptoms of dryness usually progress with time and age and require treatment that has to be maintained for continued relief. The impact is cumulative over the years, either positively if correctly treated, or negatively with no treatment or the wrong treatment.

We encountered a significant difficulty in communicating with women about details of their sexual experiences. Burd et al found similarly, "A high percentage of practitioners report taking a sexual history, physicians reported and perceived greatest discomfort when

interviewing opposite gender patients as well as patients of very young and old ages. It is clear that not only is there a need for physician education on the topic of sexual history taking, but also consideration of the impact of physician and patient gender" [4]. In our study only 38.6% women presented with dyspareunia as dominant presentation. Rest of the women constituted almost a silent sufferer group. Edwards and Panay also reported that the rate of reporting symptoms to health-care professionals by women is typically low and thus vaginal dryness goes under-treated [5]. Dallabetta et al [6] revealed that only a minority of women actually seek help due to many reasons, including embarrassment, perceptions of triviality, the misunderstanding of having to tolerate these symptoms as normal aging, a lack of awareness, inconvenience of obtaining products, or potential messiness of use. In our study also we experienced difficulties of interviewing, lack of adequate vocabulary, reluctance on part of women to understand and communicate various detailed aspects of their sexual practices. All six domains of female sexual function were assessed under only one corresponding head instead of validated standard 19 point FSFI. Jarzabek-Bielecka et al reported, "High percentage of sexually active Polish women presented with FSFI below the threshold; suggesting some grade of sexual dysfunction [7]. The study also concluded that gynaecological and sexually transmitted infections medical history should be extended to include issues related to female sexual function".

Knowledge of local sexual practices is essential for appropriate history taking and developing safer sex messages in developing countries. In our study we excluded women with vaginitis and vaginal discharge patients because of these having infection as cause of discomfort. But vaginal dryness might have contributed to vaginal infections in them. Beksinska et al reported, "Dry sex practice is common in a South African peri-urban population [8]. The younger and less educated couples were the most likely to practise dry sex. Dry sex practice was associated with an increased prevalence of self reported STDs in men but not in women.

Association between dry sex practice and STD/HIV infection has been investigated mainly in women. In total, only 16% of the women reported ever having had an STD compared with 49% of men. This may be due to lack of awareness of women having asymptomatic infections". Dallabetta et al also found that women reported STD rate of 11% which increased to 46% on physical examination, but there is no information on this association in men [9].

Knowledge of local sexual practices, event level studies, quality and type of lubrication used and duration of coitus

is an important component of managing sexual health of populations including genital infections. Reece et al reported, "Lubricant was added to 24.3% of the study provided condoms and 26.2% of the condoms selected by study participants [10]. Those with more education and those who were married were more likely to add lubrication to condoms. Adding lubricant to condoms, a female partner putting the condom on with her hands, using contraception and the event occurring with a wife (vs. girlfriend) was significantly associated with longer intercourse. Adding exogenous lubricant was not related to the participants' confidence in condoms as a method to prevent pregnancy and sexually transmitted infections. The event-level nature of this study provided for a more comprehensive assessment of the situational factors that are associated with applying lubricant to condoms. Findings from this study suggest that men are adding lubricant to condoms for reasons other than to increase condom efficacy".

Many types of lubricants are designed for relief of dryness during sexual activity. Topical moisturizers and lubricants play an important role in women with mild symptoms and in women reluctant or unable to use oral oestrogen or local applications. Lubricants and moisturizers contain a wide array of ingredients and excipients that can all affect pH and osmolality [11]. Potter & Panay reviewed, "Effects of individual additional components of lubricants which may have negative biological consequences, making them less suitable for some patients, for example those attempting conception or those at risk of sexually transmitted infections [12]. They can be stratified in the following terms: chemical features: osmolality and pH, individual components: parabens, glycols and preservatives. Side effects include tissue damage, sperm damage, irritation and so forth. Over-the-counter vaginal moisturizers and lubricants can ease the symptoms of VVA. However, their chemical composition varies enormously and some are known to cause detrimental effects due to unphysiological pH, osmolality and additives".

This intervention was primarily aimed at adding appropriate physiological lubrication during sexual act and required prolongation of foreplay. Secondary outcome of psychosexual improvement was observed in all six domains of females. Males expressed markedly improved satisfaction in general. This can be explained by the fact that appropriate lubrication nullified the adverse impacts of dryness. Satisfactory sexual act contributed to overall positivity.

Conclusion

Lubricating penis with SMCG in LFWC during coitus with women having vaginal dryness is a potent

physiological lubricant in all age groups. If pregnancy is desired then LFDC serves same purpose and is an added caution of avoiding tap water, which is not natural to the coitus. This intervention also has a potential to reduce required doses of HRT after menopause in women experiencing vaginal dryness and possibly decreasing incidence of genital infections. Considering the side effects of contemporarily available synthetic lubricants and SMCG being physiologically available natural and free lubricant, this is relatively better and safe lubricant. Added incentive for increasing duration of foreplay is also good for psychological bond among couples and a positive secondary outcome.

Strength of study

This study provides for a new technique to use naturally available physiological lubricant for dryness of vagina. Safe and modified sexual practices in breast feeding, peri-menopausal and elderly population carries scope for better bond between husband and wife, decreasing genital infections and reducing menopause related morbidity.

Limitations of the study

Study sample, population and even doctors had significant hesitation about sexual communication especially in females. Details of female sexual function could not be assessed as per validated FSFI because of illiteracy, non availability of appropriate vocabulary in local and Hindi language and ignorance about detailed perception of sexual issues. More structured studies are required to explore the use of this intervention in problem of vaginal dryness and consequent problems.

Conflicts of interest

Authors declare no conflicts of interest.

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