

Female Ejaculation: Fact or Fiction

Sandra R. Leiblum, PhD, and Rachel Needle, MS

Corresponding author

Sandra R. Leiblum, PhD
University of Medicine and Dentistry of New Jersey, Robert Wood
Johnson Medical School, Department of Psychiatry, 675 Hoes Lane,
Piscataway, NJ 08854
E-mail: Leiblum@umdnj.edu

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Female ejaculation has been a topic of debate for more than 50 years. Although there have been many anecdotal reports of expulsion of liquid from the female prostate, rigorous and large-scale studies demonstrating either the existence of the female prostate or the confirmation and nature of the ejaculate have been largely lacking. However, recent careful investigations have confirmed both the existence of semen-like liquid emission and the existence of the female prostate (Skene's Gland) as its primary source.

Introduction

For more than 50 years, debate has existed concerning the existence of a female "prostate" and the expulsion of prostatic fluid with stimulation of the anterior vaginal wall [1]. Although numerous small scale studies have been devoted particularly to female ejaculation (FE) (Table 1), they lacked scientific rigor and were not published in peer-reviewed journals. Nevertheless, anecdotal reports of FE continue to surface with unambiguous descriptions of the emission of large quantities of fluid with orgasm [2•] (Table 2).

FE is characterized by the expulsion of a significant quantity of fluid from the woman's urethra during orgasm. FE is often associated with the Gräfenberg spot or "G-spot." First identified by Gräfenberg [3] in 1950, the G-spot is located in the anterior vaginal wall, halfway between the back of the pubic bone and the cervix along the urethra. Until recently, no rigorous systematic foundation for FE and/or the G-spot could easily be found. Anatomical

evidence has been scarce and full physiological explanations have been conjectural.

These features have led some observers to doubt the existence of either the G-spot or FE. Others have been persuaded by their own empirical research [4–7] or by anecdotal reports or small surveys of women [2,8–10]. To some extent, the disparity in viewpoints reflects the general inadequacies of basic knowledge in female sexual physiology. However, recent careful anatomical and endocrinological research appears to substantiate the reality of both FE and the G-spot [11,12•]. Most importantly, the research provides a satisfactory accounting for why the phenomena may be rare and thus difficult to observe.

Review and Discussion

The production of fluids is an ordinary part of sexual stimulation and orgasm for most women [13]. Historically, there have always been women who reported the production and emission of fluids beyond what is ordinarily associated with lubrication [3,6,14]. This fluid has been characterized as different from lubrication, being more semen-like, and it has been thought to emanate from either the vagina or the urethra. The composition of the fluid is not obvious, although the taste, appearance, and frequency of it vary [2]. The fluid has variously been identified as urine arising from accidental urination [15]; as fluid similar to the fluid produced by the male prostate, originating in the female analogue, the Skene's glands [11]; and possibly as a mixture of the two. The effect of expulsion has also been attributed to unusually strong contractions of the vaginal muscles [4].

Female Anatomy

Until recently, careful microscopic investigation of vaginal anatomy largely has been lacking. Zaviacic [16] and D'Amati et al. [17] must be credited with undertaking a thorough study of vaginal anatomy in general and the human female prostate in particular. The finding that the anterosuperior wall of the vagina differs among women is of particular interest [17]. These authors report that the female prostate was observed at autopsy in two thirds of women of

reproductive age and that the presence of pseudocavernous tissue in the anterior vaginal wall varies, which might explain variations in female sexual response.

The Skene's glands (paraurethral glands) are embedded in the periurethral sponge. Among the approximately 30 periurethral glands, Skene's glands are the two that adjoin the anterior wall of the vagina. These organs have been identified as distinct areas in female anatomy for centuries [3], but Dr. Ernst Gräfenberg drew modern attention to the urethral sponge and its contribution to female sexual response in 1950. Gräfenberg wrote:

"This convulsory expulsion of fluids occurs always at the acme of the orgasm and simultaneously with it...large quantities of a clear, transparent fluid are expelled not from the vulva, but out of the urethra in gushes...[T]he secretions have no lubricating significance...but are only secretions of the intraurethral glands correlated with the erotogenic zone along the urethra in the anterior vaginal wall." [3].

Skene's glands are sometimes referred to as the "female prostate" for anatomical analogy. The male prostate is responsible for generating most of the content of seminal fluid. By analogy, the "female prostate" is conjectured to produce the content of female ejaculate [11]. The proximity of the Skene's glands to the G-spot and the suggestion that they are the source of ejaculatory fluid has provoked medical interest. The Skene's glands and the periurethral sponge are placed conveniently as a single axis for both female ejaculation and heightened erotic sensitivity in the G-spot [12]. How the glands might connect them causally has remained an area of conjecture.

Current research strongly indicates that swelling of the urethral sponge and expulsion of fluid produced by Skene's glands are highly variable among women and attributable to fundamental anatomic differences [12]. The existence and size of the ducts connecting Skene's glands to the urethra are some of the more prominent variations found among women. These ducts represent the primary avenue of excretion for the glandular fluid. Variability in the size and number of the ducts may be the primary factor in explaining the empirical uncertainty attached to FE [1]. Furthermore, some women have small pockets (urethroceles) adjoining the urethra [Roy Levin, private communication where urine may be captured along with other fluids. Because the contents of these pockets can be expressed from squeezing, they also may contribute to the fluid expelled during FE.

Nature of the Fluid or FE

These factors suggest an explanation for the disparities observed among chemical analyses of the ejaculate. Researchers have found prostate-specific antigen (PSA), confirming the relationship of Skene's glands with the male prostate, but it appears in varying quantities, as do glucose, prostatic acid phosphatase (PAP), urea, and creatinine [5,6]. The variable distributions of these substances in different

women reflect significant differences in their vaginal and urogenital anatomy. The observed variability of the G-spot and FE appears to be well correlated with fundamental variances in female anatomy. Recent studies by Jannini et al. [12] suggest that the G-spot exists but only in some women. Presence of the G-spot seems to be correlated with a higher concentration of phosphodiesterase type 5 (PDE5) in the vicinity of the urethral sponge [17]. PDE5 is the enzyme responsible for consuming nitric oxide and inhibits erection in men. Based on dissections of 14 cadavers, Jannini et al. [12] found that lower concentrations of PDE5 were found in women whose Skene's glands could not be located at all.

Associations with and Implications of G-spot Stimulation and FE

How FE and the G-spot might be correlated with the intensity of sexual response is not known. Much of the popular media coverage of these topics concerns the technical means of achieving orgasms and consequent ejaculation through G-spot stimulation [9]. The implication is that orgasms accompanied by "ejaculation" are more intense and therefore more desirable [10]. A corresponding but unstated inference is that women who fail to achieve such responses are enjoying a lesser experience than those who do. The rationale is that if the production of fluid (lubrication) is associated with arousal, then the lack of lubrication must be a sign of absent arousal. By extension, more fluid must be associated with more arousal. If the G-spot represents a hitherto undiscovered erogenous area, then finding and stimulating the G-spot should offer more erotic stimulation. Presumably, an orgasm that results in the expulsion of fluid should be more intense and therefore more satisfactory than one that produces no such emission.

At this time, there is little evidence that a functioning G-spot or an ejaculatory orgasm is necessarily indicative of greater or lesser sexual response in any sense. Encouraging women to judge their own sexual response with inappropriate criteria and measures serves little purpose; quite the opposite, in fact. Significant differences exist between women and men with respect to arousal and their own awareness of it. Considerable research has demonstrated that women can have physiological genital arousal without particular awareness and without corresponding subjective pleasure [18,19]. More lubrication is not equivalent to greater orgasmic intensity or pleasure, and emitting a fluid is not *prima facie* evidence for greater arousal or more pleasure. A woman who feels sexually disadvantaged by missing a G-spot or an ejaculatory orgasm is not deficient or inadequate. Instead, she is typical of the majority of women who do not ejaculate with orgasm. On the other hand, it is important to understand that FE fluid is not necessarily urine and that the fluid is likely similar to seminal fluid [5–7]. A woman or her partner who might be alarmed at the production or emission of fluid during arousal or orgasm should be reassured that it is neither

pathological nor unhygienic but rather a perfectly healthy and normal response to sexual stimulation.

Conclusions

Current research appears to support a number of tentative conclusions. Credible evidence exists supporting that some form of FE exists as a phenomenon independent of accidental urination. One source of the ejaculate is the female analogue of the prostate, Skene's glands. Furthermore, there is physiological evidence that an area of unusually heightened sensitivity in the anterior wall of the vagina in the vicinity of the urethral sponge exists. This area of heightened sensitivity and FE may or may not be related. Both of these phenomena are difficult to observe and occur with high variability. This variability can be attributed to significant differences among women in their urogenital anatomy. Nevertheless, although most women do not ejaculate, some do. The ability to do so in no way confirms superior female sexual functioning.

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Papers of particular interest, published recently, have been highlighted as:

- Of importance
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