

## **A Review of Female Ejaculation During Orgasm**

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During orgasm many women have reported the expulsion of a noticeable quantity of fluid (Darling, Davidson & Conway-Welch, 1990). Collected through widely distributed surveys, data suggest that many of these women believe this fluid expelled during orgasm is urine (Huggins and Preti, 1981). However, studies conducted by Grafenberg (1950) examined female ejaculate and showed it did not possess the same characteristics as urine. The direct source of the fluid has not been identified. It is thought to be linked to secretory glands located along the posterior portion of the urethra (Darling *et al.*, 1990). These paraurethral glands are somewhat homologous to the male prostate gland and appear inconsistently among women (Darling *et al.*, 1990). The paraurethral glands drain urethral glands into the urethral vestibule and have been termed Skene's glands in medical literature (Belzer, 1981). Skene's paraurethral glands and ducts, also known as the female prostate gland, develops from the same embryologic tissue as the male prostate (Zavaiacic and Whipple, 1993). Some feminists argue that the use of the terms "female prostate" and "female ejaculation" draw needless and undesirable biological analogies between males and females even though histologically the male and female prostate differ very little (Darling *et al.*, 1990). To comprehend female ejaculation its history, anatomy, physiology, and the physical characteristics of the ejaculate must be understood.

The phenomenon of female ejaculation and the female prostate is not the construct of modern society. Historical references of female ejaculation begin over 2000 years ago with Aristotle who noted that some women expelled a fluid during orgasm (Ladas, Whipple, and Perry, 1982). Much later, in 1672, De Graaf postulated the notion of the female prostate as well as female ejaculation in his book *De mulierun organis*

*generationi inserbentibus*. Following De Graff's work, Skene (1880) described two tubules which branched off into the wall of the urethra. The upper ends of these tubules terminated after a number of divisions. Termed Skene's glands they were claimed to be the female homologue of the prostate gland by Johnson (1922). Upon reviewing previous research Sevely and Bennett (1978) came to the conclusion that the source of female ejaculation was the female prostate. Although this is the most widely accepted hypothesis it has yet to be proven and is still subject to considerable controversy.

Several studies claim that the fluid itself is not ejaculate, but rather urine (Darling *et al.*, 1990). During the peak of orgasm a condition known as urinary stress incompetence allows urine to escape from the bladder (Darling *et al.*, 1990). While it is true that some women expel a fluid similar to urine during orgasm, several studies show the contrary; that the fluid expelled by some women is different than urine (Zaviacic and Whipple, 1993). Often associated with female orgasm and ejaculation is the G-spot, a highly erogenous zone on the anterior wall of the vagina first described by Grafenberg (1950). Grafenberg (1950) noted that strong stimulation of this zone led quickly to high levels of arousal which led to orgasm. While no anatomical connection has ever been shown between the G-spot and the female prostate, there is reason to believe that they are linked, if not the same (Levin, 2003).

The proportion of women able to ejaculate during orgasm varies greatly between studies. Studies done by Masters and Johnson found only 4.7% of women experience the expulsion of fluid during orgasm, while some social surveys have reported up to 54% of women experiencing ejaculation (Darling *et al.*, 1990). Very little is known about female

ejaculation; the source and nature of the ejaculate, the existence of the female prostate and their relations to the G-spot are under considerable controversy. The G-spot was first described by gynecologist Ernst Grafenberg (1950) after leaving Nazi Germany for New York. Published in an obscure journal, Grafenberg described an area along the anterior wall about one third of the way in beneath the base of the bladder. This area is highly responsive to stimulation and when stimulated rapidly leads to high levels of arousal and orgasm if maintained. The area was shown to swell and protrude into the lumen upon stimulation, however much of Grafenberg's work was ignored until it was renamed and popularized by Ladas (1982). Since the publication of *The G-spot and the other discoveries about human sexuality* by Ladas (1982) the G-spot has become linked with the phenomenon of female ejaculation and has never been far from controversy (Levin, 2003). In a survey of 786 women 72.6% of participants reported stimulation of the G-spot during sexual arousal produced orgasm (Darling, Davidson & Conway-Welch, 1990). Of the women who reported having a G-spot on the anterior wall of the vagina, 78.7% had experienced ejaculation (Darling, Davidson & Conway-Welch, 1990). A significantly higher proportion of women who experienced ejaculation also reported having multiple orgasms during sexual activities (Darling, Davidson & Conway-Welch, 1990). Estimated volumes of the ejaculate average at several tablespoons of fluid (Darling, Davidson & Conway-Welch, 1990). Another study by Schubach (2001) collected and measured female ejaculate. Participants expelled between 90 and 900mL of ejaculate per orgasm (Schuback, 2001)

Although the G-spot has slowly gained acceptance in the scientific community, there is still speculation about its existence (Hines, 2001). Hines (2001) argues that existing studies and publications fail to support the reality of the G-spot. Hines attacks the

notion of the G-spot, arguing that a sensitive area such as the G-spot should have high a high density of nerve endings. Hines notes that there has been no literature published as of 2001 showing such a plexus of nerve fibers, even though no studies have focus on identifying nerve fibers histologically in the area. However, because the anterior wall of the vagina has at least three erogenous zones, Halban's fascia, the urethra and clitoral tissue, and the G-spot, stimulation of the G-spot possibly can stimulate the other erogenous areas leading to higher states of arousal and female ejaculation (Levin, 2003).

While no direct connection between the G-spot and female prostate has been shown histologically it is possible that they are linked if not the same (Levin, 2003). The female prostate develops from the same embryonic tissue as the male prostate (Zaviacic and Whipple, 1993). Prostate specific antigen and prostatic acid phosphatase once thought to be found exclusively in the male prostate were both found in the paraurethral glands (Pollen and Dreilinger, 1984). As in males the female prostate contains glands, ducts and smooth muscle (Zaviacic and Whipple, 1993). The female prostate however contains fewer glands and is smaller in size than its male counterpart (Zaviacic and Whipple, 1993). Once thought to be vestigial, Pollen & Dreilinger (1984) demonstrated the female prostate functioned in both the exocrine and endoparacrine systems. These reports demonstrate the female prostate is, although small, a functional organ which produces prostatic secretions and contains cells capable of neuroendocrine function.

The finding that female ejaculate not only differed from urine, but had similar components to male prostatic secretions, was a major discovery in female sexuality (Zaviacic and Whipple, 1993). The possible lubricating values of the ejaculate have been

dismissed since the ejaculation of the fluid occurs at the peak of sexual stimulation during orgasm, rather than at the beginning of sexual excitement (Darling *et al.*, 1990). In two studies urine and ejaculate were collected from a sample of women and analyzed (Addiego, Belzer, Comolli, Moger, Perry, and Whipple, 1981; Belzer, Whipple and Moger, 1984). The ejaculate had significantly higher concentrations of prostatic acid phosphatase and fructose than urine (Addiego *et al.*, 1981; Belzer *et al.*, 1984). The ejaculate also showed significantly lower concentrations of urea and creatinine than urine collected from the same participants (Addiego *et al.*, 1981; Belzer *et al.*, 1984). Although not all women experience ejaculation, 40% believed the fluid spurt to be urination (Darling *et al.*, 1990). This helped many women who felt that rather than ejaculating during sex, they were urinating (Zaviacic and Whipple, 1993). In the past it was recommended that women experiencing this expulsion of fluid suppress experiencing orgasm or to have surgery for urinary stress incontinence (Zaviacic and Whipple, 1993). Increased awareness of female ejaculation may help women and their partners feel comfortable with this phenomenon and avoid the surgery intended to eliminate it (Zaviacic and Whipple, 1993).

It is hoped that education on the subject of female ejaculation will aid women who experience this phenomenon from undergoing irreversible surgery designed to eliminate the natural sexual response. The relationship between the G-spot, female prostate and female ejaculation has not yet been determined. Strong stimulation of the G-spot and erogenous zones on the anterior wall of the vagina can produce orgasm and ejaculation in some women (Darling *et al.*, 1990). The ejaculate has been shown many times to be significantly different than urine (Addiego *et al.*, 1981; Belzer *et al.*, 1984; Sensabaugh

and Kahane, 1982; Zaviacic, Dolezalova, Holoman, Zaviacicova, Mikulecky, and Brazdil, 1988). However the source of the ejaculate has yet to be found, and the hypothesis that the G-spot and female prostate are, in fact, the same structure remains unproven.

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