Journal of Sex Research
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/hjsr20

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Version of record first published: 11 Jan 2010.

The Journal of Sex Research Vol. 17, No. 1, pp. 13-21 February, 1981

Female Ejaculation: A Case Study

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Abstract

This case study provides objective evidence supporting the hypothesis that female ejaculation, a partial, infertile homologue of male ejaculation, exists. A karyotypically normal, multiparous woman suffered for a decade with urinary stress incontinence. During that time she had learned to inhibit an orgastic response which led to bedwetting. Although the liquid produced did not appear to be urine, she falsely concluded that her orgasmic expulsion was a manifestation of urinary incontinence. Using feedback from a Vaginal Myograph, she learned to do Kegel exercises properly, and the urinary stress incontinence soon disappeared. Around this time she became aware of the concept of female ejaculation and its possible association with an erotically sensitive area that could be stimulated through her anterior vaginal wall. Stimulation of this area, the "Grafenberg spot," produced what she described as orgasm which felt "deeper" than orgasms in response to vulvar stimulation. Such an orgasm was often accompanied by expulsion of liquid from the urethra. Chemical analysis indicated that the expulsion was not urine. It contained prostatic acid phosphatase, an enzyme characteristically found in prostatic secretion.

Sevely and Bennett (1978) and Belzer (1981; Notes 1, 2) have called for scientific inquiry into the question of whether or not some women ejaculate upon orgasm. They used the term "female ejaculation" to refer

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to an orgasmic expulsion which is at least partially homologous to male ejaculation, rather than to any other sort of expulsion of liquid which might occur at the time of a woman's orgasm (e.g., urine, vaginal secretion). They considered the female prostate, the system of glands and ducts which surrounds the urethra and which is the embryologic homologue of the male prostate, a plausible source of female ejaculate.

This case study includes findings consistent with the hypothesis that female ejaculation, as defined above, actually occurs in at least one woman. The subject was a karyotypically normal, multiparous, married woman in her late thirties who provided written, informed consent for the study. Her willingness to submit to all phases of the study, and the cooperation of her husband, led us to select her from a number of women who might appropriately be considered "ejaculators." The report includes anecdotal, electro-myographic, physical examination, and clinical chemistry material.

Background Information About the Subject

The subject said that after birth of her second child, in her mid-twenties, she had developed urinary stress incontinence, manifested by involuntary voiding when she sneezed, jumped, or coughed. With some orgasms, she had expelled a liquid which she thought was another manifestation of this incontinence. Around this time her physician told her that she had a grade one cystocele.

She had tried inconsistently over a period of approximately 10 years to overcome the urinary stress incontinence by doing Kegel exercises (Kegel, 1949), but without success. These exercises were prescribed by her gynecologist, but no evaluation was done to see if she was doing them correctly. In April, 1979, she was tested with a Vaginal Myograph (Note 3), coupled to a Cyborg P 303 EMG biofeedback device and a Q 700 RMS Data Processor. The root mean square data processor automatically calculated the average electrical potential generated during six 10-second periods of voluntary vaginal contraction. Each contraction period was followed by 10 seconds of voluntary relaxation, during which average baseline potential was recorded. The difference in average potential between the six baseline and contraction measurements reflected the strength of voluntary contraction. The subject's contractions generated a potential of 2 μV above baseline activity. It appeared that she had been contracting the wrong muscles, the gluteals, in prior efforts to do Kegel

exercises. In July, 1979, with the aid of a 10-minute biofeedback session involving the Vaginal Myograph, the subject learned how to do the Kegel exercises correctly. She said that for the next month she practiced the exercises an average of five days a week, trying to perform 300 contractions a day. These exercises were done without the use of any apparatus. At a follow-up Vaginal Myograph session in August, 1979, she was still able to do the exercises correctly, and her contractions had increased in strength, registering 5 μV above baseline when tested the same way as in April. Also at this time, she reported that she no longer had urinary stress incontinence.

The Grafenberg Spot

At the April, 1979, testing session, the subject identified an erotically sensitive spot, palpable through the anterior wall of her vagina. We subsequently named this area the "Grafenberg spot," in recognition of the person who wrote of its existence and relationship to female ejaculation (Grafenberg, 1950). The subject asked the physician on our team for a vaginal examination in order to learn more about this spot.

Physical examination revealed a normal introitus and a freely movable, retroverted uterus. The ovaries and adnexa were normal. The cervix was clean and the vaginal mucosa was normal, with a very slight cystocele evident. The subject noted an area of increased sensitivity during palpation along the urethra. It coincided with a fairly firm area approximately 2 cm by 1.5 cm, with the long axis along the course of the urethra. This area was palpated, and the subject reported it caused the sensation of having to urinate. Further digital stimulation made the sensation pleasurable. The area grew approximately 50% larger upon stimulation. No contraction of the spot could be elicited voluntarily or involuntarily.

At the time, the examining physician thought the area might be a sphincter, a urethral caruncle or other tumor, or a female prostatic homologue. He later became aware of Grafenberg's (1950) paper and concluded that the area palpated in the subject was the Grafenberg spot. (The exact anatomical nature of this spot has not yet been determined.)

Orgasmic Expulsion by the Subject

The subject reported that she experienced the sort of orgasms described by Masters and Johnson (1966) in response to manual, oral, or vibrator

stimulation of the vulvar area. She was not aware of ever expelling during such an orgasm. Orgasmic expulsions seemed to occur only in response to digital or penile stimulation of the Grafenberg spot by her mate.[1] She reported that coitus in the following positions led to orgasm with expulsion: female on top, female supine with male kneeling, standing face to face, and rear entry. The subject indicated that when she was enjoying Grafenberg spot stimulation, and the orgasms that resulted, clitoral stimulation was aversive.

With the aid of the subject's husband, four of us (Addiego, Belzer, Perry, and Whipple) were able to observe her response to digital massage of her Grafenberg spot, which led to expulsion of liquid, and reportedly and apparently to orgasm, on several occasions. On none of these occasions did stimulation of the clitoris, direct or otherwise, appear to occur. Orgasmic expulsions occurred after less than a minute of stimulation; they were separated in a multi-orgasmic series by similarly brief periods of time. The urethral area was clearly exposed in bright light, and there was absolutely no doubt that the liquid was expelled from the urethral meatus. Sometimes it exuded from the meatus. At other times it was expelled from one to a few centimeters. On one observed occasion, expulsion was of sufficient force to create a series of wet spots covering a distance of more than a meter.

When the Grafenberg spot was stimulated, the area around the urethral meatus appeared to push outward, and the orifice became clearly prominent and everted a few seconds prior to orgasm. This occurred whether or not liquid expulsion accompanied the orgasm. The color of this area of the vulva deepened, changing from the pink color that existed before intravaginal stimulation to a burgundy hue. With the help of Richard Price, Inc., Teaneck, N.J., we obtained a motion picture record of these phenomena.

The subject's first three orgasms at the filming session were accompanied by expulsions. Later in the session, she reached orgasm several more times and expressed surprise when informed that no expulsion had occurred. On the basis of this observatation, we concluded that the orgasms she experienced in response to the Grafenberg stimulation felt much the same, whether or not they were accompanied by expulsion. She agreed with our conclusion.

[1] After this case study was submitted for publication, the subject reported that there has now been one exception to this. She said she had recently experienced orgasm accompanied by ejaculation in response to cunnilingual, but no Grafenberg spot, stimulation.

Collection and Analysis of Orgasmic Expulsion

Pilot work with urine and orgasmic expulsion specimens collected by the subject, in the absence of the research team, suggested: The orgasmic expulsion contained higher levels of glucose and of an enzyme, prostatic acid phosphatase (PAP), characteristic of the prostatic component of semen; Two substances easily detected in urine, urea and creatinine, were present in lower levels in the orgasmic expulsion than in the urine.

Four specimens of the subject's orgasmic expulsion were then collected, always in the presence of at least two members of the research team (Belzer, Perry and/or Whipple) for chemical assay. In order to minimize chances of contamination by residues of semen, specimens were obtained (as were pilot study specimens) after the subject had refrained from coitus for more than 48 hours (Schumann, Badawy, Peglow, & Henry, 1976). One was obtained by having the woman hold a clean glass firmly against the perineum while she lay in a supine position, knees flexed, with her feet resting on a bed. Her husband inserted two fingers into the vagina and, with the help of her verbal feedback, stimulated the Grafenberg spot. Expelled liquid flowed down past his fingers and into the glass. (Several other specimens, not used for chemical analysis, but referred to below, were also collected this way.)

The three other orgasmic expulsion specimens subjected to chemical analysis were obtained at the photographic studios within a period of 30 minutes. Stimulation of the Grafenberg spot was accomplished as described above, except that a surgical rubber glove was worn on the stimulating hand. The bottom half of a vaginal speculum, equipped with a fiber optic light source, was used to retract the posterior wall of the vagina. It also illuminated the vaginal barrel during a portion of the filming which was intended to record changes in the anterior wall in response to digital stimulation. The concave "bill" of the speculum trapped liquid which flowed down into it from the urethral meatus.

For comparison purposes, we also obtained three urine specimens during breaks in the film-making. These seven specimens were promptly transferred to vials and put into a freezer until they could be chemically analysed.

All specimens which were to be chemically analysed were briefly centrifuged at 900 × g and, when necessary, the supernatants were diluted with sterile, distilled water prior to analysis. Creatinine (by the Jaffe reaction) and urea were measured by methods of Chasson, Grady, and

Stanley (1961) and Marsh, Fingerhut, and Miller (1965), respectively, using a Technicon AAII autoanalyzer. Glucose was determined by the glucose oxidase method, using a Beckman autoanalyzer.

PAP was measured by the Tartaric Acid Inhibition method of Jacobsson (1960), using P-nitrophenol phosphate as substrate (Sigma Chemical Company). The validity of this assay for measuring PAP in urine specimens was assessed by determining the recovery of a known amount of PAP activity in diluted semen when it was added to urine specimens from four females (age range, 8–38 years). The high recovery of added PAP activity, 96.3 ± 9.7% ($M \pm SD$), indicated an absence of interfering substances in urine.

Comparison of Orgasmic Expulsion and Urine

Concentrations of PAP were significantly higher, $t(5) = 3.60$, $p < .01$, while urea and creatinine concentrations were significantly lower, $t(4) = 3.39$, $p < .025$, and $t(4) = 6.14$, $p < 0.005$, respectively, in the four orgasmic expulsion specimens when compared to the three urine specimens (Table 1). Glucose concentration did not differ significantly in the two types of

Table 1
Comparison of the composition of ejaculate and urine specimens

Specimens	Prostatic acid phosphatase (Sigma units/ml)	Urea (mMol/l)	Creatinine (μMol/l)	Glucose (mg/100 ml)
Ejaculate				
1	21.25	125.0	1780.0	21.5
2	8.55	27.0	1070.0	37.0
3	33.00	[a]	[a]	48.0
4	23.75	80.0	3800.0	54.0
M	21.6	77.3	2216.7	40.1
SD	10.1	49.1	1416.4	14.3
Urine				
5	0.15	240.0	14000.0	50.0
6	0.15	160.0	9600.0	3.5
7	0.10	204.0	14000.0	3.5
M	0.13	201.0	12533.0	19.0
SD	0.03	40.0	2540.0	26.8
t(df)[b]	3.60 (5)**	3.39 (4)*	6.14 (4)**	1.36 (5)

[a] not determined due to insufficient sample.
[b] one-tailed test.
* $p < .05$.
** $p < .01$.

specimens, because mild glycosuria was present in one urine specimen, $t(5) = 1.36, p > .10$.

The dissimilarity of chemical composition of the orgasmic expulsion and urine specimens indicates that the expulsion in this subject was not a manifestation of urinary incontinence. It is also unlikely the expulsion was solely residual urethral urine, with the composition changed by passive diffusion of water and solutes across the urethral epithelium. Such a mechanism would be unlikely to produce a 166-fold increase in PAP concentration, with only a 2.6-fold decrease in the urea concentration.

The subject reported that when the orgasmic expulsion dried it never left a stain on cloth, as urine does. Urine specimens produced by the subject, just prior to and just after orgasmic expulsion, appeared to vary within the usual ranges of yellowish color and clarity/turbidity. They were obviously different in appearance from the expulsion.

Various individuals who were not on our team were shown freshly collected specimens of the expulsion and asked informally to characterize them. This was not done in "blind" fashion. Several reported that it had no urine taste or odor. The physical appearance was likened to colostrum, watered-down fatfree milk, and prostatic fluid. This translucent, whitish, nonviscous liquid contained whitish particles of matter which were detectable by the naked eye.

Gram-strain examination revealed many superficial epithelial cells and abundant bacteria in a specimen of the expulsion. The presence of bacteria is not surprising as there was no effort to use sterile collection techniques. The epithelial component coincided with the results of previous study of the plasma of male ejaculate. Seminal plasma contains not "merely . . . intact cells, but . . . the outcome of cellular breakup processes in the secretory epithelia" (Mann, 1964, p. 38).

One hypothesis on the origin of the expulsion, compatible with its composition, is that the expulsion is largely a glandular secretion, with a higher concentration of PAP and possibly glucose and a lower concentration of urea and creatinine, than urine. The PAP suggests that at least part of the glandular secretion came from prostatic tissue. It was not possible to determine from the available data whether the urea and creatinine in the expulsion were due to residual urethral urine, to urine released from the bladder at the time of expulsion, or to some other source. It is known that human semen averages approximately 12 mMol of urea/l (Mann, 1964). Because we could find no reference to the

presence of creatinine in human semen, we assayed a single semen specimen from a vasectomized donor. This specimen yielded 305 μMol of creatinine.

Discussion

This idiographic study supports the conclusion of Sevely and Bennett (1978) that female ejaculation, a partial, infertile homologue of male ejaculation, exists. Much of its significance lies in the folkloric saying, "The exception proves the rule." The rule that female ejaculation does not exist is invalidated by the verification of a single case of such ejaculation. Thus, the door to nomothetic research into the incidence and nature of the phenomenon is opened still further.

This case does not support the hypothesis of Belzer (1981) that female ejaculation tends to be followed by a refractory period. Normative research, however, is needed to evaluate the hypothesis properly.

Most people receive early, often severe, lessons about the wrongness of bedwetting. The belief that ejaculation is exclusively a male potential has been thoroughly taught in our culture. Given these circumstances, it is not surprising that concerned professionals and the public have usually assumed that the orgasmic expulsion of a liquid from a woman's urethra is due to an inappropriate loss of control. Most have assumed it was a sign of defect or disease. However, even in the case of the woman we studied, who had a history of urinary stress incontinence, those assumptions appear to have been wrong. According to our subject's report, such mistaken assumptions made her learn to inhibit the type of orgasmic response which was sometimes accompanied by ejaculation. However, in her own words, becoming aware "that the fluid I ejaculate from my urethra is something other than urine . . . has helped free me . . . to enjoy sex and orgasm so much more. . . . My husband and I feel much freer and I am able to enjoy our sexual relationship much more."

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Accepted for publication October 22, 1980