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STATEMENT OF AUTHORSHIP

James G. Pfaus and Karolin Tsarski: Conceptualization; Karolin Tsarski: Data Sampling; James G. Pfaus: Data Analysis; James G. Pfaus: Writing-Original Draft; James G. Pfaus and Karolin Tsarski: Writing-Review and Editing.

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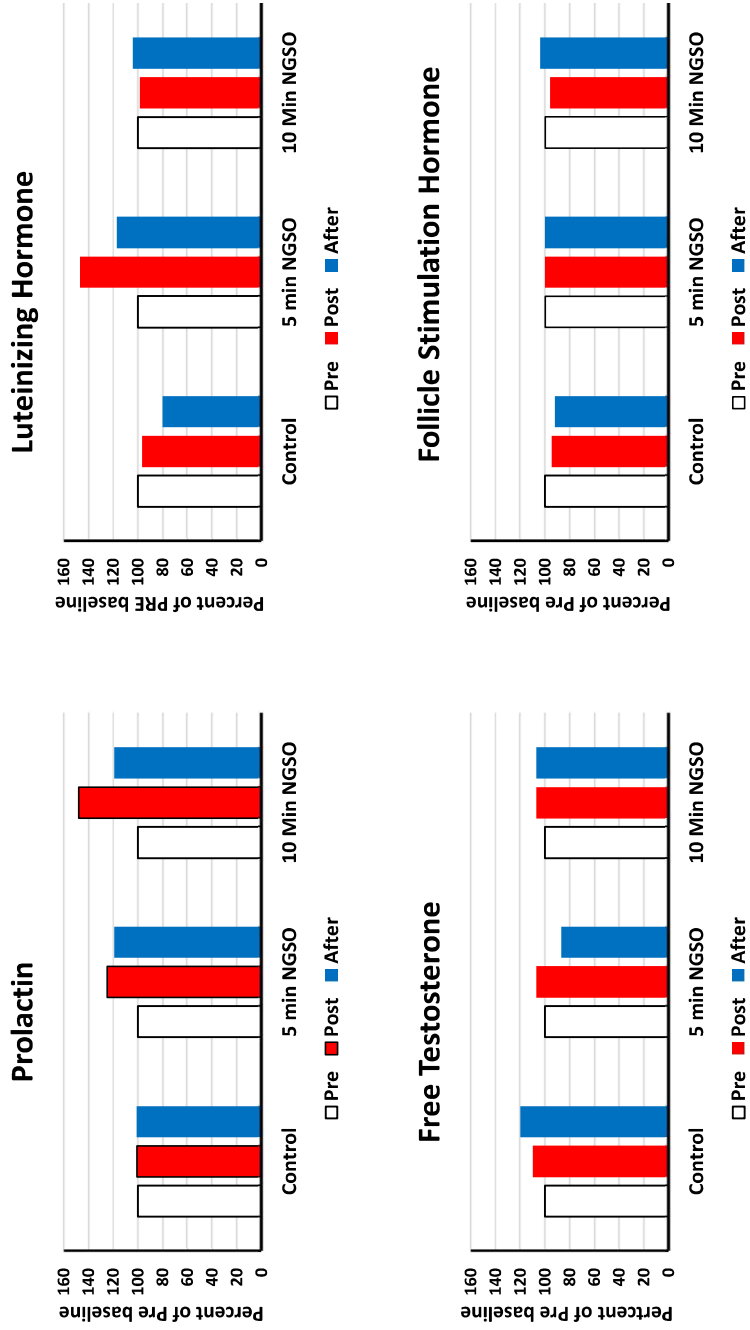


Figure 2. Serum hormone levels as a percent change from the pre baseline during the 3 conditions (control, 5-minutes orgasm, 10-minutes orgasm).

The increase in luteinizing hormone during the 5-minutes NGSO was unexpected. Compared to her other pre baseline levels, the pre level before the 5-minutes orgasm was elevated, suggesting that she was in or around the ovulatory stage of her menstrual cycle. Indeed, as mentioned above, her pre levels of prolactin were increased before the 10-minutes orgasm condition a week later, suggesting that she was in her luteal phase at that time. Estradiol levels peak and fall before ovulation, which precedes the rise in progesterone secreted from the corpora lutea. During this time the ovaries release a pulse of testosterone²⁷ which, combined with the genomic and non-genomic effects of the previous estradiol peak, increases women's responsivity to sex-related cues and their sexual desire.^{18,28–30} An increase in luteinizing hormone-stimulated by orgasm during this phase could also enhance pregnancy, suggesting that female orgasm may have a reproductive function during this phase of the cycle.

Finally, yoga and tantra meditation training is reported to enhance sexual arousal, desire, and orgasm in both women^{31,32} and men,³³ and can facilitate sexual satisfaction overall³⁴ and intimacy in couple-based sex therapy.³⁵ Brotto and colleagues have refined this into a mindfulness-based approach to treat sexual arousal, desire, and pain disorders in women.^{36–38} Such training may well sensitize spinal and brain circuits for sexual climax and orgasm^{4,39} which should also feed forward to enhance neural mechanisms of sexual arousal and desire.¹⁸

CONCLUSIONS

The ability to be orgasmic sensitizes with sexual experience throughout the lifespan. Although orgasms are typically activated by genital stimulation in a “bottom-up” fashion, it is clear that they can be induced without genital stimulation in a “top-down” fashion that reflects both sensory and motor memory and may be activated by dreams, fantasy, and erotic imagery, especially in women. The woman examined in the present case study was able to put herself into a relatively continuous orgasmic state after years of yoga and tantric training. The increase in prolactin observed in the present study was an objective response to orgasm and followed a lawful pattern of doubling as the time spent in orgasm doubled, similar to the results of a prior study in which women had 1 or 2 orgasms during partnered sex.¹⁴ These data suggest strongly that NGSOs are not “faked” or partial orgasms, but rather reflect a top-down induction of a real subjective orgasmic state that includes objective hormonal changes.

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ORS ratings by type of orgasm

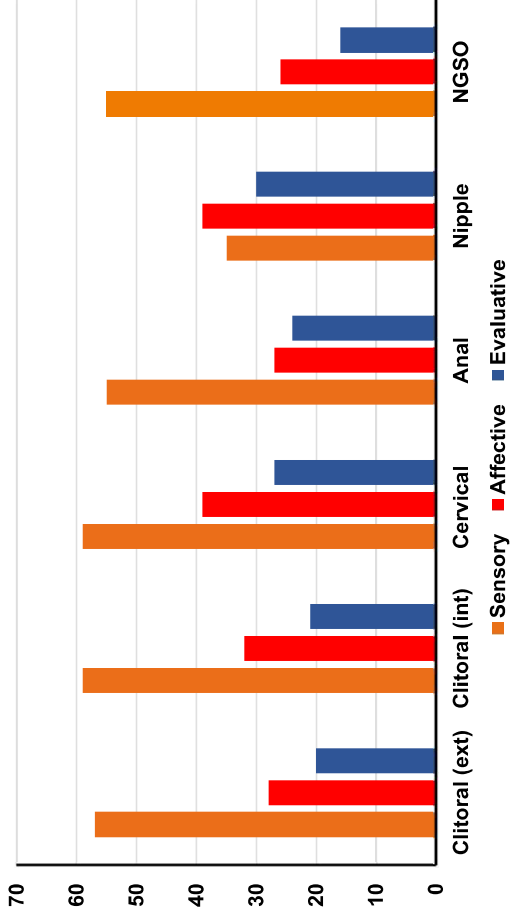


Figure 1. Subjective orgasm ratings on the sensory, affective, and evaluative subscales of the ORS. The sensory domain consists of 13 adjectives that describe sensations of building, flooding, flushing, spurring, throbbing, and general spasms, for a potential total possible score of 65. The affective domain consists of 9 adjectives that describe emotional intimacy and ecstasy for a total possible score of 45. The evaluative subscale consists of 6 adjectives that describe pleasurable satisfaction and relaxation for a total possible score of 30. The woman compared her orgasms from external clitoral glans stimulation, internal clitoral (“G-spot”) stimulation, cervical (“A-spot”) stimulation, anal stimulation, nipple stimulation, and the spontaneous 10-minutes NGSO. ORS = Orgasm rating scale.

in each condition are shown in [Table 1](#). Hormonal responses for each condition expressed as percent change from the pre baseline samples are shown in [Figure 2](#).

Prolactin levels from pre to post increased by 25% or 48% after the 5- or 10-minutes NGSO, respectively, and were still elevated from the pre baseline sample 30 minutes after. No changes

were recorded in FSH or free testosterone. Interestingly, LH levels were higher, to begin with on the day of the 5-minutes NGSO (in a range suggesting a preovulatory surge), and the NGSO elevated LH levels by 45%, which remained elevated 30 minutes after. This elevation was not observed a week later when the 10-minutes NGSO was evaluated. However, the pre level of prolactin was elevated at this time relative to the other conditions, suggesting that the woman was in her luteal phase. Although free testosterone increased slightly 30 minutes after the book reading control (from 1 to 1.2 nmol/L), no increases in other hormone levels were observed for the control condition.

Table 1. Serum hormone concentrations in each condition

Condition	Pre	Post	After
Prolactin (mIU/L)			
C	206	208	238
5	212	263	253
10	524	773	625
Free testosterone (nmol/L)			
C	1.0	1.1	1.2
5	1.5	1.6	1.2
10	1.5	1.5	1.4
Luteinizing hormone (IU/L)			
C	4.61	4.54	3.67
5	10.11	14.86	12.83
10	6.41	6.11	6.19
Follicle stimulating hormone (IU/L)			
C	3.8	3.6	3.5
5	4.1	4.1	4.1
10	2.5	2.3	2.4

C = control; 5 = 5-minutes orgasm; 10 = 10-minutes orgasm.

DISCUSSION

Leeners et al⁶ proposed using the post-orgasmic prolactin surge as an objective marker of orgasm quality, given that the surge levels followed a lawful increase in women that experienced 1 or 2 orgasms during partnered intercourse, and whose subjective rating of the orgasm quality also increased progressively from 1 to 2 orgasms. Moreover, the surge is not likely to be affected by movement artifacts during orgasm. A similar increase in prolactin was observed from the 5-minutes to 10-minutes NGSO in the present case study. In fact, the prolactin surge following the 10-minutes NGSO was in the range reported by Leeners et al after 2 orgasms from partnered intercourse.

a consistent, orgasm-induced surge of prolactin released from the anterior pituitary into the peripheral bloodstream.¹⁴ Because neuroendocrine cells in the hypothalamus that contain prolactin releasing factor are kept tonically inhibited by hypothalamic dopamine neurons,^{15,16} the surge in pituitary prolactin release is indicative of the sudden inhibition of both hypothalamic and mesolimbic dopamine transmission at orgasm.^{17,18} Notably, prolactin release is not likely to be affected by movement artifacts at orgasm. Indeed, low to moderate exercise intensity usually requires a duration of more than 60 minutes at a sustained intensity of 75% VO₂ max to induce a significant increase in plasma prolactin levels.^{19,20} Sexual activity to orgasm has a reported energy expenditure of approximately 1.7 to 3.3 metabolic equivalent tasks (METs), depending on the sexual position and the latency to orgasm.²¹ This is roughly equivalent to walking at a pace of 5 km/h, stretching, or doing a light yoga workout, which would not be sufficient to induce a significant rise in plasma prolactin.

Interestingly, orgasms can also be induced without genital stimulation. It has long been known that people experience orgasms occasionally during sleep^{22,23} or after exercise.²⁴ Some women can have orgasms simply by engaging in imagery and fantasy.²⁵ Paraplegic men and women also report “phantom” orgasms.²⁶ This suggests that the top-down control of orgasm can be activated on its own under certain conditions in sensitized individuals.

CASE STUDY

The present case study involves a 33-year old woman who developed the ability to attain and control the duration of a subjective orgasmic state without genital stimulation after a decade of yoga training initiated by her relative difficulty with vaginal orgasms due to vaginismus and other pain at penetration. She described her yoga tantra training as:

“...learning body postures, breathing techniques, body locks aimed at learning how to awaken and sense energy and then learning to guide it and move it upwards. In addition, I did pelvic floor exercises, breast massage practice, and practices to release shame and guilt. I learned to relax and let go, accepted body image, and brought increased mindfulness also to daily life in general.” Sexual pleasure and whole-body orgasms were not forced as a goal, but simply revealed themselves more and more as her training progressed. Ultimately, her whole-body orgasmic capability sensitized to such an extent that she not only overcame her vaginismus but was able to put herself into a continuous orgasmic state almost instantly and have it last for a long period of time.

Two questions were raised about her non-genitally stimulated orgasms (NGSOs). The first concerned how the

subjective experience of her NGSOs related to her current experience of genitally-stimulated orgasms (GSOs) or those attained from stimulation of erogenous zones (eg, nipples). The second, and perhaps more important question, concerned whether the orgasms were “real” in the sense of being accompanied by changes in objective measures previously associated with orgasm.

The study first examined the general subjective quality of a typical 10-minutes NGSO relative to those she attained through genital or erogenous (eg, nipple) self-stimulation. Data were obtained using the Mah and Binik Orgasm Rating Scale.⁴ This validated scale measures orgasm quality using 5-pt Likert ratings of adjectives that describe sensory experiences, affective reactions, and the degree of pleasure/relaxation induced by the orgasm. These are shown in Figure 1. Subjectively, the NGSOs were as pleasurable as external or internal GSOs (eg, clitoral orgasms), and produced a relatively similar set of sensory experiences. However, her NGSOs were somewhat blunted in the affective domain (for feelings of emotional intimacy and ecstasy) relative to her other orgasms.

Next, we assessed hormone levels (FSH, LH, prolactin, and free testosterone) from blood drawn 30 minutes before (Pre), immediately after (Post), and 30 minutes after either a 5-minutes NSO, a 10-minutes NSO, or a control condition in which orgasm induction was replaced with 10 minutes of reading a book. Sessions were conducted in a hospital room with an attending nurse and were filmed for a video (in both English and Estonian): <https://www.youtube.com/watch?v=JuN7paHMBtg>. Briefly, the pre blood sample (3.5 mL) was taken into a Microtainer microcollection tube, after which the woman lay down on the examination table and made herself comfortable before engaging in one of the 3 conditions: 10 minutes continuous orgasm, 5 minutes continuous orgasm, or the control condition of 10 minutes of book reading. These were done at weekly intervals with no other sexual stimulation between each. The woman was not on hormonal contraceptives or any other medication, nor did she engage in any recreational drug use.

After each orgasmic condition or control (timed by the nurse with an electronic stopwatch), the second Post sample (3.5 mL) was taken. The woman then sat in the examination chair quietly for another 30 minutes, after which a third blood sample (3.5 mL) was taken (After). All blood samples were frozen in a -20°C freezer where they remained until the assays were conducted by a commercial laboratory (SYNLAB Eesti OÜ, Tallinn, Estonia; www.synlab.ee). Serum was extracted and analyzed for free testosterone (nmol/L), follicle stimulating hormone (IU/L), luteinizing hormone (IU/L), and prolactin (mIU/L), using an enzyme-linked immunosorbent assay (ELISA) to quantify hormone levels across the 3-time points for each condition. The lab then sent the data to the woman (second author) who coded it so that the first author would be blind to the experiential conditions. After data analysis and figures were made, the code was broken to reveal each condition. The raw data for each hormone

A Case of Female Orgasm Without Genital Stimulation

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ABSTRACT

Introduction: Orgasm is a complex, multimodal reflex induced typically by genital stimulation. Genitally stimulated orgasms (GSOs) activate excitatory neurochemical pathways in the brain and spinal cord that ultimately stimulate sympathetic outflow and the inhibition of parasympathetic spinal circuits in the lower lumbar cord. However, some women claim to have orgasms spontaneously without genital stimulation.

Aims: To report the case of a 33-year-old woman who developed the ability to attain and control the duration of a subjective orgasmic state without genital stimulation after tantric training.

Methods: Blood was taken at weekly intervals before, during, and after spontaneously-induced orgasms that lasted 5 or 10 minutes, or after a 10-minutes period of book reading. Plasma was analyzed using ELISA for luteinizing hormone, follicle stimulating hormone, free testosterone, and prolactin. The woman also provided subjective scores for different types of orgasms using the Mah and Binik (2002) Orgasm Rating Scale (ORS).

Results: Prolactin levels post orgasm increased by 25% and 48%, respectively, after the 5- or 10-minutes non-genitally stimulated orgasm (NGSO), and were still elevated from baseline 30 minutes after orgasm. No changes were observed in FSH or free testosterone. The pattern of sensory, affective, and evaluative orgasm ratings after a 10-minutes NGSO was similar to orgasms induced by clitoral or anal stimulation. Book reading did not result in any change in prolactin.

Conclusion: Prolactin surges after orgasm are an objective marker of orgasm quality. The increase in prolactin after her NGSOs indicate that they induce the same physiological changes as GSOs and result from “top-down” processing in the brain. **Pfaus JG, Tsarski K, A Case of Female Orgasm Without Genital Stimulation. Sex Med 2022;10:100496.**

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Key Words: Spontaneous Orgasm; Hormone; Prolactin; Orgasm Rating Scale

INTRODUCTION

Orgasm is a complex, multimodal reflex induced typically by genital stimulation. Such stimulation activates excitatory neurochemical pathways in the brain and spinal cord that ultimately stimulate sympathetic outflow and the inhibition of parasympathetic spinal circuits in the lower lumbar cord. In women, this can be achieved by stimulation of the external and internal

clitoris, anterior cervix, nipples, and other erogenous zones in sensitized individuals.¹ Although the reflex is a product of “bottom-up” genitosensory stimulation, it is also controlled by “top-down” processing of excitation and inhibition that controls both the timing of parasympathetic and sympathetic blood flow, and the subjective ability to “let go” into the orgasm when it is imminent. Indeed, orgasms activate cortical, limbic, hypothalamic, and brainstem structures,^{2–6} and can be rated subjectively in terms of the quality and type of sensory stimulation, affective experience, and the evaluation of pleasure.^{7–9}

Although orgasms are accompanied reliably by reflexive activation of pelvic floor muscles,¹⁰ those along with changes in brain activation and patterns of electrical activity in the cortex^{11,12} suffer from significant movement artifacts during orgasm that is difficult to control for.¹³ However, orgasms are also accompanied by neurochemical and endocrine changes that characterize both the pleasurable state and longer-term inhibition (refractoriness). Among these correlates is

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