

A brief historical survey of female orgasmic emission: galen's observations and...current controversies

Abstract

The female anatomophysiology was studied in the History of Medicine mainly with regard to the reproductive perspective.¹ This cultural perspective derived from a secular ideological prejudice concerning the passive role of the woman not only in the conception but also during the sexual intercourse.² Although important observations are already present in Galen of Pergamum's (c. 129-199 A.D.) treatises,³ one must wait till the mid 20th century to find a scientific description of the female sexual physiology.⁴⁻⁸ We focus here our attention on an even less studied phenomenon, on which we kept our mind for a historical comparison: the emission/ejection of vestibular secretions during sexual response.⁹ The datum may be observed—although in variable percentages (5%-10%?) in women not only during their fertile age.¹⁰ This fact must be distinguished from the genital humectation mainly caused by the vaginal transudate and by the secretion of the major vestibular glands (or “Barholin's glands”). This symptom, which is still rather unknown even by specialists, was considered as either casual or anecdotal and often ascribed to uracrasia.¹¹ In our modern WEB era and thanks to the collection of nearly numberless data concerning the description of this phenomenon^{12,1} the attention to the interpretation and clinical semiotics of this evidence has increased,¹⁰ also owing to the number that was inconceivable few years ago¹³ of persons, who have described the symptom. In this study the Authors compare Galen's passages with a brief historical survey and with the data of the present scientific literature.

Keywords: female, ejaculation, spot, galen, prostate, scientific literature, inconceivable, anecdotal, vaginal

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Introduction

Preliminary remarks

Restif de la Bretonne (1714-1806)¹ wrote: “Elle m'a rendu heureux, je l'ai rendu mère: nous sommes quittes” (She has made me happy; I have made her mother: we're all square). His thought summarizes the thousands-years old idea that the man had about the sexual role of the woman. The “female sex gratification” was never taken into consideration by the medical science and by a male-chauvinist society, in which the dominant imperative was from the one hand the male satisfaction, from the other hand the task of the wives, i.e. to bear children and raise them in order to dispose either of heirs of the family patrimony, or—in the more miserable cases—of farm labourers. Women's condition did not change for many centuries, although with alternating fortunes. Indeed Demosthenes (384-322 B.C.) maintained

¹After an our very humble and popular telecast we have received nearly numberless e-mails (all signed and with sure data of provenance), which witness the female embarrassment and the scanty communication the women suffer from about this topic even with their family doctors. Find here two e-mails as examples:

a) “Dear Dr... I am writing to you because I have read an article of yours in the journal... in which you dealt – although in brief – with the female ejaculation. I am a 20 years old girl and am on love terms with a 32 years old man since some months. I enjoy a wonderful sexual (thankfully not only sexual!) agreement and we have really frequent sexual intercourses. Since the first times my pleasure and my participation “explode” in this kind of orgasm, which is rather singular, as far as I can understand: whenever I am enjoying greatest pleasure, which often occurs during one and the same sexual intercourse, I emit “water” (I could not have recourse to a different definition) that is odourless, colourless and lightly salty. I do not succeed in quantifying it, but I assure you that I emit a lot. On these occasions I enjoy a great pleasure together with my partner, but I wonder that I do not succeed in finding a sound description of this kind of physical reaction in the WEB as well as in the popular medical texts. I know

that we have female courtiers for our pleasure; cohabiters to look after us daily; wives to give us children want to be faithful wardens of our houses”.² In short three women for each man and each of them with different jobs X. At the end of the 19th century the official medicine was still absolutely disinterested in the female sexuality save either for restraining it, or “...to appeasing the uterine fury”.

personally other women to whom this fact occurs (although – I must say – in a minor amount) and they too ignore what it is and what may ever be its cause. I would appreciate very much if you could either let me know some pertinent information in this regard or suggest some medical texts or some physicians, who deal with this topic. I thank you and remain yours sincerely B...”

b) “Kindest Doctor... I am a 36 years old and recently married lady. In the past I have had other partners before marrying my husband. The problem that I am going to describe and to ask you your kind advice on line, because I do not dare speak to my family doctor owing to my shyness. I hope you understand me... About one year ago my husband gave me a vibrator I had asked him for. Using it with me I began “making water” for the first time just during an orgasm. At the beginning I was not certain and was also ashamed. I must confess that the liquid that flows out sometimes even abundantly and literally squirts, sometimes flows out slowly but always in profusion has the same smell of the urine, although it is not so yellowish. We decided not to use the instrument for a certain time and everything seemed to go well until I had the same problem even during a long foreplay and during a sexual intercourse. Sometimes it is like if the waters had broken (we have just had a baby and the experience could be alike) and the liquid flows out in the same manner. At any rate I enjoy a great pleasure and the event is not painful at all. On the contrary I also supposed that my husband was able to let me reach orgasms that nobody had ever caused. Could it be so? Have you some solution for my problem? As a matter of fact the occurrence annoys me also owing to the fact that practically after each sexual intercourse with my husband the sheet are sodden and dirty to the point that I must change them. In this connection, when this liquid dries up it leaves whitish haloes in the sheet. I would not worry my husband, but I also hope not to suffer from any disease. I thank you heartily if I can receive a Kind response to my e-mail. Best regards. K...”

Indeed the “hyperactive women”, who were later erroneously called “nymphomaniacs” Cf. Ernest Borneman.¹⁴ The Italian physiologist and anthropologist Paolo Mantegazza (1831-1910) was still writing in 1910 in his treatise “Fisiologia del piacere” (Physiology of the pleasure) that “in the sexual intercourse the two sexes behave in different manner with regard to the participating activity. The woman is nearly completely passive and therefore she can do the sexual act unconsciously and therefore without pleasure, whilst the man needs his whole energy”.^{7,15} Although as Sergio Musitelli wrote¹⁶ “the medical research had already reached thanks to Giovanni Battista Morgagni’s¹⁷ studies the complete explanation of the role of the prostate gland in the male physiology and pathology”, nonetheless the complete understanding of the role of the female paraurethral glands mainly with regard to the peculiar physiology we are dealing with (f.e.= female ejaculation) is an only recent event.^{10,18-34} Nevertheless one cannot find any mention of it even in the treatise “Le disfunzioni sessuali femminili” (Female sexual dysfunctions) published by a group of authoritative authors in 2003.¹⁹ There is no doubt that the subject of female sexuality has only been dealt with during the last decades under the perspective of scientific observation and of a research at last free from other “cultural” considerations.

Adopted terminology^{II}

- Female prostate gland²⁰ (Figure 1 & Figure 3) (cf. “Skene’s and intraurethral or “periurethral” glands) although these terms are not quoted in all the recent texts on anatomical terminology.^{21,22}
- Skene’s or paraurethral glands: they were described for the first time by Alexander Johnston Chalmers Skene²³ and are considered as the vestigial homologous of the male prostate gland.²⁴ They are equal and symmetric and belong to the so-called “female prostate gland” together with the exocrine periurethral glands (Figure 1). Their excretory duct is placed near the urinary meatus; it is often in a lateral position and protrudes towards the vestibulum vaginae.²⁶ An important characteristic concerning the e.f. that we are going to analyse is the following: the ducts of the Skene’s glands flow often into the urethra in a new born girl.²⁵
- Periurethral (or “intraurethral”) glands:^{III} invaginations of the epithelium of the urethral mucous membrane where the clear mucous cells are placed. They are present in different numbers, i.e. from 2 to 10. Colloidal matter may be found into the lumen of these glands.^{26,27}
- G-spot (the term “spot” is rather improper under an Euclidean perspective because according to Euclides (fl.c. 300 B.C.) a “slot” has no extension): it is an area of variable dimensions that may be appreciated through the anterior vaginal wall as far as c.3 cm. from the vestibulum vaginae and corresponds to the facing cuff that is present in the inferior third of the urethra (Figure 3).¹⁰ Its identification is ascribed to Ernest Gräfenberg.²⁸ The stimulation of this area can raise in a variable percentage the orgasmic response^{10,29} and, occasionally, the so-called “female ejaculation”. However some authors do not agree with this observation.^{30,31}
- Female ejaculation: (both “squirting” and “gushing” are synonymous, although some authors are inclined to distinguish them⁷⁰: emission or ejection of secretion through the urethra and the orifice of the “Skene’s glands” during or at the top of the female sexual response.^{10,32-36}

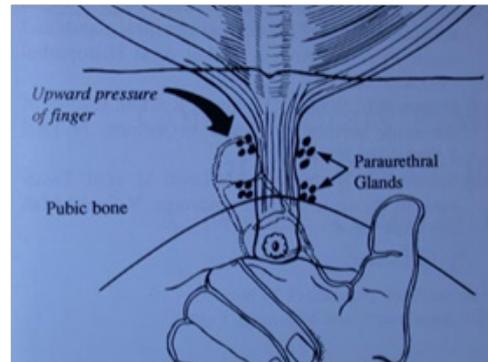


Figure 1 Skene’s or paraurethral glands.⁸⁷

Historical remarks De foeminae ejaculatione³⁷

The existence of a female genital area^{37,38} corresponding to that, which nowadays although with many distinctions many Authors call “female prostate gland”²⁰ is already described in ancient times.³ Nevertheless as said above not all the Authors agree that this area that may be appreciated through the anterior vaginal wall may be identified with the so-called G. spot.^{39,40} Galen of Pergamum argued with Heróphilus of Calcedon (still living in Alexandria in the 2nd half of the 3rd century B.C.) and wrote³ “Such meatus (i.e. the uterine tubes) do not insert either into the cervix of the bladder or in the cervix of the uteri and, although these are much nearer than the fundus vesicae, nonetheless one can see them inserting neither into the cervix of the bladder, nor into the fundus vesicae, but rather into the two sides right and left of the uterus, at the top of the two horns^{IV} and effusing the semen inside. Should the female be pregnant the semen remains in that place, whilst in the case of an ejaculation during the sleep it first flows into the uteri, then falls out. And I could also observe recently that a very abundant and very thick semen flowed first inside, then outside in a woman suffering from uterine troubles. It is clear that such a considerable amount of semen had accumulated simply owing to the fact that the woman had been left a widow since a long time. Moreover she suffered from cramps of the loins, the hands and the feet to the point that she appeared as if she were in the grip of convulsions, during which semen was ejaculated and she told me that she perceived a pleasure quite similar to that she enjoyed during a sexual intercourse. And this semen was thick and abundant owing to the simple fact that it had not been ejaculated for a long time. By contrast, in other women the ejaculated semen is scarce and fluid and flows from the front tract of the vulva, just from the place, through which they pass water”.³ The description is exact and unequivocal: in this passage Galen referred to a urethral and/or paraurethral emission. In brief, we must remember the following subsequent scientific researches on this topic. Apart from the Hindu high relieves (Figure 2), in order to have further details we must wait the 17th century, when the Dutch anatomist Reignier de Graaf (1641-1763) described in 1672 the periurethral zone of the lower 3rd of the female urethra and identified it as a potential erogenous area: “the discharge of the female gland causes a pleasure like that of the male”.⁴¹

However, Sergio Musitelli reminds us that as for anatomical exactness De Graaf himself mistook the ovarian follicles for “eggs” (whilst the oocyte was only discovered and described by Karl Ernst von Baer (1792-1876) in 1827) and that this De Graaf’s mistake “gave origin to the relentless and hardest controversy¹ between “ooists” and “spermatists”.⁴² No further contributions may be found in the

^{II}They are the terms and the entries that one can most frequently find in the pertinent works.

^{III}Vestibular minor glands according to the anatomical terminology.

^{IV}One must remember that the uterus was “horned” according to both Heróphilus and Galen. This is why Galen does not write “uterus” but “uteri”.

fundamental treatise of Giovanni Battista Morgagni (1682-1771), although he had put a milepost in the study of the prostate gland.⁴³ In the mid 19th century the French surgeon Alphonse François Guérin (1816-1895) observed and described the paraurethral glands⁴⁴ that were later called after the Scottish gynaecologist, who described them for the first time with plenty of particulars: Alexander Skene.⁴⁵ Sigmund Freud (1856-1939), in his turn, in 1805 considered the casual orgasmic female ejection to be a hysterical event:⁴⁶ “an anomalous secretion of the vaginal mucous membrane he writes is considered as a cause of repulsion”. By contrast Robert Latou Dickinson’s (1861-1950) study *Human Sex Anatomy*,⁴⁷ published in 1949 was a very important contribution to the further researches concerning the anatomical and topographical study of the genital organs. One year after, the already quoted Gräfenberg²⁸ described the discovery of a zone that was perceivable by pressure of the fingers and caused an erogenous response through the anterior vaginal wall. JD Perry & B Wipple⁴⁸ called the identified area spot G after the name of its discoverer: “An erotic zone- they write always could be demonstrated on the anterior wall of the vagina along the course of the urethra... analogous to the male urethra, the female urethra also seems to be surrounded by erectile tissues...In the course of sexual stimulation, the female urethra begins to enlarge and can be felt easily. It swells out greatly at the end of orgasm...Occasionally the production of fluids is ...profuse...“If there is the opportunity to observe the orgasm of such women, one can see that large quantities of a clear transparent fluid are expelled not from the vulva, but out of the urethra in gushes. At first I thought that the bladder sphincter had become defective by the intensity of the orgasm. Involuntary expulsion of urine is reported in sex literature. In the cases observed by us, the fluid was examined and it had no urinary character. I am inclined to believe that “urine” reported to be expelled during female orgasm is not urine, but only secretions of the intraurethral glands correlated with the erotogenic zone along the urethra in the anterior vaginal wall. Moreover the profuse secretions coming out with the orgasm have no lubricating significance; otherwise they would be produced at the beginning of intercourse and not at the peak of orgasm.”²⁸



Figure 2 Hindu high relief in the Karnataka temple (c. 1.000 A.D.)⁸⁸

Alfred Charles Kinsey (1894-1956) performed the first real attempt at studying the facts under both the functional and dysfunctional perspective with his fundamental “Reports” concerning the sexual behaviour of the USA people.⁴⁹ With regard to the f.e. he maintained

that “Muscular contractions of the vagina following the orgasm may squeeze genital secretions and, sometimes, they are excreted violently”.⁴⁹ On must wait until the 60th years, when William Masters (1915-2001) and Virginia Eshelman Johnson (1925-2013) gave a fundamental boost towards the modern sexology. However about f.e. they affirmed⁵⁰ that “Most women do not ejaculate during orgasm... we have observed several cases of women who expelled a type of fluid that was not urine yet dismissed it” “female ejaculation is an erroneous but widespread concept.” However 16 years later (in 1982) they wrote: “...they repeated the statement that it was erroneous and the result of “urinary stress incontinence”.”⁵¹

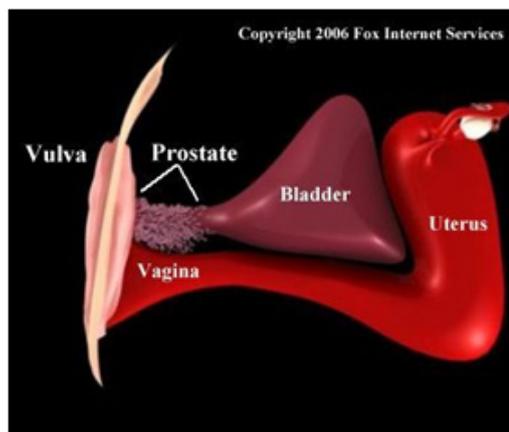


Figure 3 Three-dimensional scheme of the “Female prostate gland”.

Our brief historical survey ends with Addiego’s, Balzer’s, Comolli’s, Moger’s, JPerry’s and B.Wipple’s work “Female ejaculation: a case study” published in 1981 in the “Journal of Sex Research”;⁵² where the Authors describe a sensitive area of the anterior vaginal wall “about the middle between the pubic symphysis and the uterine cervix” along the course of the urethra. The lengthy stimulation of the so-called “G-spot” causes a vascular congestion with consequent local turgor and many different sensations that may reach their climax with ejection and orgasm.⁵²

Recent researches

In these last years the joint findings of comparative anatomy, embryology, pathological anatomy, anthropology and normal human histology agree enough about the genesis of the so-called f.e. considered as a result of the secretions of the urethral and/or paraurethral glands.

Comparative anatomy

The data of comparative anatomy witness for the thesis we advocate in this study. In 2007 A. Aguiar and his partners of the Veterinary Clinical Department of the S. Paul University in Brazil started from the premise that the presence of female prostate-like tissue was observed in many species (bat and many others included) and that different Authors affirm that the paraurethral ducts and glands are functional and homologous to the male prostate gland. They have submitted 25 specimens of dogs for histological examination; have gathered the urethras from the urinary bladder to the vulva and fixed them in 10% packed neutral formalin. At this point they have evaluated the obtained sections for the research of the “prostate gland” in the specimens. Not colored sections of the tissue were cut from bulks of paraffin and tested with polyclonal anti-PSA antibody. The

gland was found in 32% (i.e. 8/25) of the cases. In the light of these characteristics it has been proven for the first time in the scientific literature that these glands may be considered as “the female prostate gland of the dogs, as well as they are in other vertebrates”.⁵³



Figure 4 Pablo Picasso (1881–1973). Naked woman (with vulvar ejection).

Anthropology

The description of phenomena that may be interpreted as female ejaculation appears in some anthropological studies in the 20th century. Bronislaw Malinowski (1884-1942) in his treatise “The sexual Life of Savages in North-Western Melanesia” published in 1929 informs us that one only word is used in the Trobriand dialect to mean both the male and the female ejaculation: “Both the male and female discharge he writes are called by the same name (momona or momola), and they ascribe to both the same origin in the kidneys, and the same function, which has nothing to do with generation, but is concerned with lubricating the membrane and increasing pleasure”.⁵⁴ Harold Sterling Gladwin (1883-1983) describes the sexual intercourses among the Micronesian Trukese people and maintains that the female orgasm is generally signaled by micturition.⁵⁵ Edgar Gregersen, anthropologist at the Queen's College of the University of New York writes in his treatise “Sexual practices: The Story of Human Sexuality” published in 1983: “The Yapese people practise a coital technique called “gichigich” before marriage and it is said that it brings the woman to fever-pitch...Once they married, they do not practise it continually and have more often recourse to the so-called “missionary position”. The male inserts only the glans into the vagina with longitudinal movements. The woman enjoys orgasms one after another and involuntary urinates after each orgasm. The man feels like if he were upon a fire”.⁵⁶

Pathological Anatomy and PSA (prostate specific antigen)

According to the embryological acquisitions^{57,58,59,V} also the anatomopathological observations, obtained by surgical exeresis, witness the

^VThe epithelium of both the male and female urethra is of endodermal origin, whilst the interposed connective tissue and the musculus prostaticus derive from the splanchnic mesoderm. At the end of the third month of pregnancy the epithelium of the prostatic urethra begins proliferating and form a certain number of evaginations, which expand into the surrounding mesenchyma. These rudiments will realize the prostate gland in the male, whilst in the female the cranial tract of the urethra will originate the urethral and paraurethral glands. These being the facts, we deduce from them the common endodermic embryological origin of these structures. (L. Calzolari). In particular, the urethral and paraurethral glands derive from the urogenital sinus.

presence of prostate tissue in women. Among the others: In 1993 Milan Zaviacic and his team report an autopsic case of adenocarcinoma of the Skene's gland. The neoformation has shown a common prostate-specific antigen as well as the presence of prostate acid phosphatase. The Authors conclude that the Skene's glands are “the homologous of the male prostate in women and the following tumors are immuno histo chemically similar to the male prostate carcinoma”.⁶⁰ In 2010 Valery N. Kazakov and his team report a series of lesions found in the lower tract of the female genital organ. Among the cases there is included a mass as big as 4, 5 cm., which represents a hyperplasia of the glandular and stromal of the paraurethral tissue of the paraurethral Skene's gland, a little prostate ectopic lesion in the vulva and 4 vaginal tubulo-squamosal polyps. All the lesions were immuno positive for both the PSA and the prostate acid phosphatase.⁶¹ Finally in 2011 Aldo De Rose has reported about the argument of the “female PSA dosage” has made a report about the realization of a sophisticated and particular means to measure the PSA in normal women that could not be dosed by the common available means. Moreover the PSA “would also meaningfully increase in cases of mammary tumors”.⁶²

Current histological and biochemical observations

First of all we agree with the statement quoted in Giulia D'Amati's contribution:⁶³

“One of the most important records in sexology concerning vaginal histology is the proven individual micro and macro- anatomical variability. Indeed it seems that the male histological and anatomical model is substantially constant, whilst the female one is characterized by remarkable variety from woman to woman. To acknowledge this fact, as the empirical research proves, takes at last the breath away to the “political use” of the female orgasm in its two opposing clitoral and vaginal variants”.

- a. Starting from the year 2000 the scientific contributions and Helen O' Connel's – an Australian Urologist – published writings have not only proposed new cues of study, but have also given origin to diatribes concerning the argument⁶⁵. According to the Author the NMR (Nuclear Magnetic Resonance) has emphasized a multiplanar anatomical shape of the clitoris and, by consequence, has integrated the reports of the dissected materials. She has also introduced the concept of “clitoral bulbs” as a spongy area that continues the other clitoral parts. The distal urethra and the vagina are intimately connected and form a “cluster” of tissue with the clitoris. It seems that this “cluster” would be the trigger place (together with the “mental disposition”: remark of the Authors!) of the orgasm^{66,67}. Moreover these areas are endowed with common vascularization and innervation and therefore they “respond like a unit” during sexual stimulation.
- b. In the light of the most recent data ^{8,9,10,11,18,33,36} as pointed out by Emmanuele Jannini and its team¹⁰ we can now maintain he writes that very important differences exist between the vaginal rear and front wall under the microscopic anatomy point of view. They are chiefly due to the topographic seat of the vagina. The connections are with the urethra as well as with spongy periurethral body. Therefore the vaginal front wall appears like a structure, the submucous membrane of which is subtended by both a “pseudocavernous” and a glandular periurethral tissue, that was already partially described by Skene. The so-called “female prostate gland” shows a structure substantially analogous to the male one.¹⁰ Moreover it is characterized by an immunohistochemical aspect analogous to that of the male. In

connection with our topic, it is worth observing that the ducts of the Skene's glands may be observed overhanging the urethra in new born girl²⁵. The Skene's gland is considered as the main source of the prostate-specific antigen, which is present in the fluid discharged by the urethra after direct stimulation of the front vaginal wall.⁶³

- c. Emmanuele Jannini also writes – in the same quoted contribution¹⁰ that “the plenty of nervous fibers and of vascular structures of the periurethral region represents the potential morphological substratum of the so-called Stem G.⁵² The immunohistochemical analysis performed on the vaginal wall has indirectly emphasized the importance of the nitro-oxide-cyclic GMP-phosphodiesterase of C type (No-cGMP-PDES) for the control of the haemodynamic changes in the vaginal wall that are analogous to the male ones. Indeed the immunohistochemical studies have proven the presence of a high number of nervous positive fibers for the NO synthetase (NOS) in the contest of the smooth muscular tissue and below the Malpighian vaginal epithelium”.^{10,64,65} The integrated NOS-PDES system plays a physiological role in the sexual response in the male as well in the woman. The female excitatory sexual response caused by the thematic arterial afflux and the reduction of venous efflux increases the vaginal congestion and lubrication. This phenomenon occurs a little after the sexual stimulus (even only ideational) and is perceived as a “humectation” of the sexually excited woman, because of the exudation of secretions towards the vaginal mouth and the minora labia pudendi. As we know now this phenomenon is quite different from the so-called f.e.
- d. Although the definition and the meaning of the so-called “Gräfenberg's spot” (better “area”) are still controversial, nonetheless it would be a sensory zone, the adequate stimulation of which may be “subjectively pleasing”⁶⁸ and may cause orgasm in the 30% of the women. The pressure by the fingers on this area may cause the emission of a viscous and transparent of liquid at the top moment of the sexual response. Components that are present in the male prostate liquid may be found also in the liquid flowing fro the vulva (for instance the prostate-specific antigen).⁶⁰ This report in variable percentage (5%-10%) can be found in women (“orgasmic women”: remark of the Authors!) not only in their fertile age⁶⁹. The secretion, which must be distinguished from the vaginal and vulval humectation mainly caused by the vaginal transudate and by the secretion of the “Barholin's glands”²⁷ is emitted (and sometimes ejected) by the urethra and by the orifices of the “Skene's glands”. The amount of this liquid is variable and in proportion with the representativeness of the glandular tissue, by which it is formed and, at any rate, it is probable that this phenomenon depends from the individual variations of the microanatomy of the vagina.^{66,67}
- e. Finally Z. Pastor and his team have published in the J. of Sex Medicine⁶⁸ a recent revision of the f.e. topic. Pastor himself evaluates the prevalence of f.e. between 10% and 54% and leans to a differentiation of the f.e. from the so-called “squirting”. As for some of its components the f.e. would be biochemically similar to the seminal plasma. By contrast the properly called “squirting” would consist of a transparent liquid emitted in more or less appreciable amount with elective evidence and, although it contains prostate-specific antigen, nonetheless it would be characterized by a major fluidity with a density of 1.001.67±2.89;

urea: 417.0±42.88 mg/dL; creatinine: 21.37±4.16 mg/dL; uric acid: 10.37±1.48 mg/dL.^{69,VI}

- f. The modern understanding of the complex anatomical and physiological variants during the female sexual response was possible thanks to the imaging techniques.⁷⁰ In this way we have visualized the dynamic interaction of the female genital organs during either the autonomous stimulation or the coition. However no single structure coherent with the “G spot” has been identified. The anatomical reports and the dynamic interactions among the clitoris, the urethra and the anterior vaginal wall induced some Authors⁷⁰ to describe a “clito-urethral-vaginal complex” (C.U.V.). It is a morph-functional zone that may cause orgasmic responses, and more seldom urethral/paraurethral emission if correctly stimulated during penetration.⁷¹ During the last decades we have reached also in Italy an integrated view of the female sexual response only thanks to the cooperation of the anatomical, psychological, gynaecological and sexological researches^{7,10,18,72}

Practical semeiotics and differential diagnosis

- a) The palpation of the so-called “G” area (“G.spot” according to Perry and Wipple) is difficult in basal conditions, whilst in many cases it is remarkable through the anterior vaginal wall like a “swelling” as wide as about 1 cm., of tense-elastic consistency during the excitatory phase.
- b) The stimulation of this area causes emission/ejection of vestibular (urethral/paraurethral) secretions in variable percentages (5-10%) of the orgasmic women.
- c) As for the technique of either digital or instrumental or coital stimulation, the reports are plentiful in both manuals and many current affairs press⁷³⁻⁷⁶ but they are scarce in scientific texts. On the basis of our interviews,⁷⁷ of evidences,^{VII} researches^{VIII} and in Web⁷⁸⁻⁸³

We have pointed out the following characteristics:

- a. the stimulation/massage of the anterior vaginal wall from upwards to downwards, from lateral to medial and from backward to forward, obtained by any means (although preferably by finger pressure) causes congestion of the area that underlies just this place;
- b. moderate swelling may be perceived through the vaginal wall and an emission of transparent and mutably viscous liquid from the paraurethral and/or from the urethral orifice can be observed;
- c. the amount of the liquid is variable from few to 5-10 cubic centimetres. The strength of the ejection is variable and in some cases it causes micturition. The temperature is perceived as higher than the cutaneous one;
- d. the differential diagnosis with emission of urine even in lack of laboratorial reports – is relatively easy: the secretion does not leave any rim in the cloths after evaporation;
- e. the Valsalva maneuver may facilitate the clinical observation;
- f. this ejection has not been observed in oneiric phase.

^{VI}Our thought is different. (Cf. “Conclusions”, 5.2; 6.3 and 8).

^{VII}It is the most frequently described modality. By contrast the report during sexual cohabitation is inconstant.

^{VIII}We confine ourselves to refer to the Italian WEBs.

Conclusion

At this point we can maintain that:

1. The phenomenon of the female emission of urethral liquid, either during or at the top of her sexual response was described in earlier times more either by popular and anecdotic texts^{74,84,86} or by various iconography (Figures 2 & 4) than by scientific reports;^{67,69} this in spite of Aristotle's (384-322 B.C.) really outstanding statement (cf. *De Generatione animalium* (Generation of animals), I, 20, 727b34 ff.) that: "There are some, who think that the female contributes semen during sexual intercourse because women sometimes derive pleasure from it comparable to that of the male and so produce a fluid secretion. This fluid, however, is not seminal; it is peculiar to the part, from which it comes in each several individual; there is a discharge from the uteri, which though it happens in some women, does not in others. Speaking generally, this happens in fair-skinned women of a masculine appearance. When it occurs, this discharge is sometimes on quite a different scale from the semen discharged by the male, and greatly exceeds it in bulk";
2. The Authors suppose that a major terminological uniformity would be exceptionally useful for the descriptions and against the misinterpretations of the occurrence. The term "ejaculation" (a male phenomenon) itself could profitably be replaced with the term "emission" (or "ejection");
3. The so-called f.e. is a product of the secretion and emission of the paraurethral and intraurethral glands after a suitable tactile erogenous stimulation mainly performed on an area corresponding to the lower third of the anterior vaginal wall and in a condition of good psychological compliance of the subject;
4. Although the phenomenon of urination may be occasionally present, it is not due to uracrasia;
5. It was never described on the occasion of nocturnal spontaneous pollutions;
6. The prevalence of the datum is variable:^{10,70} however we have good reasons for believing in the light of the collected witnesses^{IX} that it is still undervalued by the medical researches;
7. The public interest for the phenomenon must be taken into careful consideration (under the entry "female ejaculation" one finds about 1.020.000 issues),⁸³ in W.E.B.;
8. Apart from the above quoted Pastor,⁷⁰ we did not find works, which pointed out the difference between the secretion of the vestibular minor glands and that of the Skene's glands during the occurrences of f.e. and their possible subsequent biochemical differentiation. We think that, although this procedure is surely not easy, nonetheless it may be performed with preventive obliteration made by inserting into the urethral meatus the so-called "Fogarty's catheter";^X
9. Every study on this topic must not be interpreted as an invitation to research this orgasmic occurrence and by consequence to cause

the same anxiety in the public that the mythicization of either the multiple or the synchronous orgasm caused. It is simply a cue for a comparative and phenomenological consideration;

10. Galen's descriptions³ coincide with the up-to-day findings.

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Conflicts of interest

Authors declare that there is no conflict of interest.

References

1. Musitelli S, Bossi M, Allegri R. *Storia dei costumi sessuali in occidente*. Milano: Rusconi; 1999:7-12.
2. Tannahill R. *Storia dei costumi sessuali*. Milano: Rizzoli; 1985:52.
3. Galeno, *De semine* II, 1 = K, IV, 512 ss.
4. Kinsey AC, Pomeroy WB, Martin CE, et al. *Sexual Behavior in the Human Female*. Philadelphia: W.B. Saunders Company; 1953.
5. Masters WH, Johnson VE, Kolodny RC. *Masters and Johnson on Sex and Human Learning*. Boston: Little Brown; 1982.
6. Kaplan HS. *The new sex therapy*. Milano: Bompiani; 1990.
7. Simonelli C e coll. *Storia della sessuologia in Italia. Rivista di sessuologia clinica*. Milano: Franco Angeli Editore; 2005.
8. Pirozzi Farina F e coll. Inquadramento storico DSF. In: Cioffi e coll, editor. *Le disfunzioni sessuali femminili*. Pisa: Pacini Editore; 2003:10-14.
9. Belzer EG. Orgasmic expulsions of women: a review and heuristic inquiry. *Journal of Sex Research*. 1981;17(1):1-12.
10. Jannini E, Lenzi A, Maggi M. *Sessuologia medica-trattato di psicosessuologia e medicina della sessualità*. Milano: Elsevier Masson; 2007:2-5.
11. Bohlen JG. Female Ejaculation and urinary stress incontinence. *J Sex Res*. 1982;18(4):360-368.
12. Feltes S. Female ejaculation. 2013.
13. Bullough B, David M, Whipple B, et al. Subjective reports of female orgasmic expulsion of fluid. *Nurse Pract*. 1984;9(3):55-59.
14. Borneman E. *Dizionario dell'erotismo*. Milano: Rizzoli; 1988.
15. Mantegazza P. *Fisiologia del Piacere*. Milano: Casa Editrice Madella; 1910.
16. Musitelli S, Ogliaresi F. *La prostata nella storia della medicina*. Milano: Selecta Medica; 2006.
17. Morgagni GB, *De sedibus et causis morborum per anatomen indagatis*. Venezia: 1761. In: Barile E, Suriano R, editors. *Il "Catalogo di libri" di Giambattista Morgagni. Edizione del testo e identificazione degli esemplari posseduti dalla Biblioteca Universitaria di Padova*. Padova: Lint; 1983.

^{IX}We have recourse to the so-called "little Fogarty's catheter" (or "Fogarty's balloon") to perform embolectomies in vascular surgery.

^XHowever it is worth observing that during the 5th and the 4th century B.C. the enslavement of women was already dramatically declared in the first Medea's monologue in the homonymous tragedy of Euripides (484/480-406 B.C.) played in 431 B.C. and that in the same period a long and hard feminist movement exploded in Athens and was ridiculed by Aristophanes (445-385 B.C.) in the comedy "Ecclesiazusai" (Women in constituent assembly) played in 391 B.C.

18. Graziottin A. Sessualità e fisiopatologia sessuale. In: Netter FH, Zanoio L, editors. *Ginecologia e Ostetricia con tavole di*. Milano: Elsevier Masson; 2007;165–196.
19. Cioffi L e coll. *Le disfunzioni sessuali femminili*. Pisa: Pacini Editore; 2003:100.
20. Wernert N, Albrech M, Sesterhenn I, et al. The 'female prostate': location, morphology, immunohistochemical characteristics and significance. *Eur Urol*. 1992;22(1):64–69.
21. <http://www.ifaa.net>
22. *Terminologia Anatomica: International Anatomical Terminology*. 1st ed. Stuttgart: Thieme; 1998.
23. Skene A. The Anatomy and pathology of two important glands of the female urethra. *American Journal of obstetrics and diseases of Women and Children*. 1880;13:265–270.
24. Zaviacic M, Jakubovská V, Belosovic M, et al. Ultrastructure of the normal adult human female prostate gland (Skene's gland). *Anat Embryol (Berl)*. 2000;201(1):51–61.
25. Kumar R. *Textbook of Human Embryology*. I K International Publishing House; 2008.
26. Testut L, Latarjet A. *Traité d'Anatomie Humaine*. 9th ed. Paris: G. Doin et Cie; 1972.
27. Bloom W, Fawcett DW. *Trattato di istologia*. Milano: Piccin Ed; 1970.
28. Grafenberg E. The role of the urethra in female orgasm. *Int J Sexol*. 1950;3:145–148.
29. Davidson JK, Darling CA, Conway-Welch C. The role of the Grafenberg Spot and female gushing in the female orgasmic response: an empirical analysis. *J Sex Marital Ther*. 1989;15(2):102–120.
30. Puppo V. *La sessualità umana e l'educazione a fare l'amore*. Firenze: Ed. Loggia de' Lanzi; 2005.
31. Rabinerson D, Horowitz E. G-spot and female ejaculation: fiction or reality? *Harefuah*. 2007;146(2):145–147.
32. Sevely JL, Bennett JW. Concerning female ejaculation and the female prostate. *J Sex Res*. 1978;14(1):1–20.
33. Heath D. An investigation into the origins of a copious vaginal discharge during intercourse: "enough to wet the bed"-that "is not urine". *J sex res*. 1984;20(2):194–215.
34. Darling CA, Davidson JK Sr, Conway-Welch C. Female ejaculation: perceived origins, the Grafenberg spot/area, and sexual responsiveness. *Arch Sex Behav*. 1990;19(1):29–47.
35. Rubio-Casillas A, Jannini EA. New insights from one case of female ejaculation. *J Sex Med*. 2011;8(12):3500–3504.
36. Korda JB, Goldstein SW, Sommer F. The history of female ejaculation. *J Sex Med*. 2010;7(5):1965–1975.
37. Puppo V. *La sessualità umana e l'educazione a fare l'amore*. V Puppo Ed. 2011.
38. Puppo V. The G-spot does not exist. G-spot and lack of female sexual medicine. *Gynecol Obstet Fertil*. 2010;38:781–784.
39. De Graaf R. Tractatus de Virorum Organis Generationi Inservientibus (1668) and De Muliebribus Organis Generationi Inservientibus Tractatus Novus. In *J Reprod Fertil*. 1972;17:1–222.
40. Musitelli S. *L'evoluzione della sessuologia*. Pavia: La Goliardica Pavese; 1995. 340 p.
41. Morgagni GB. De sedibus et causis morborum per anatomem indagatis. Venezia: 1761. In: Il "Catalogo di libri" di Giambattista Morgagni. *Edizione del testo e identificazione degli esemplari posseduti dalla Biblioteca Universitaria di Padova*. Padova: Lint; 1983. 122 p.
42. Guérin AFM. Maladies des organes génitaux externes de la femme. Leçons cliniques sur les maladies des organes génitaux internes de la femme. Paris: Delahaye A & Cie; 1878. 298 p.
43. Skene A. The Anatomy and pathology of two important glands of the female urethra. *American Journal of obstetrics and diseases of Women and Children*. 1880;13(1):265–270.
44. Freud S. Fragments of an Analysis of a Case of Hysteria. *The Standard Edition of the Complete Psychological Works of Sigmund Freud*. Translated from the German under the General Editorship of James Strachey. Vintage: Frontispiece Sigmund Freud; 1999. 84 p.
45. Dickinson R. *Atlas of Human Sex Anatomy*. 2nd ed. Baltimore: WILLIAMS & WILKINS CO; 1949. 175 p.
46. Addiego F, Belzer EG, Comolli J, et al. Female ejaculation: a case study. *Journal of Sex Research*. 1981;17(1):13–21.
47. Kinsey AC, Pomeroy WB, Martin CE, et al. *Sexual Behavior in the Human Female*. Philadelphia: W.B. Saunders Company; 1953. 842 p.
48. Masters WH, Johnson VE. *Human Sexual Response*. Boston: Little Brown; 1966. 366 p.
49. Masters WH, Johnson VE, Kolodny RC. *Masters and Johnson on Sex and Human Learning*. Boston: Little Brown; 1982. 250 p.
50. Addiego F, Belzer EG, Comolli J, et al. Female ejaculation: a case study. *Journal of Sex Research*. 1981;17(1):13–21.
51. Aguiar, Adriana CS. Female paraurethral prostate gland in bitches. *Brazilian Journal of Veterinary Pathology*. 2013;6(3):106–110.
52. Malinowski B. *The Sexual Life of Savages in North-Western Melanesia*. NY: Harcourt Brace; 1928. 682 p.
53. Gladwin T, Sarason SB. *Truk: Man in paradise*. NY: Wenner-Gren Foundation for Anthropological Research; 1956. 1192 p.
54. Gregersen E. *Sexual Practices: The Story of Human Sexuality*. New York: Franklin Watts Edition; September. 1983. 320 p.
55. Sadler TW. *Langman's Medical Embryology*. Lippincott: Williams&Wilki; 12th ed. 2011. 384 p.
56. Mann G, et al. *Imaging of Gynecological Disorders in Infants and Children, Medical Radiology*. Berlin Heidelberg: Springer-Verlag; 2012. 620 p.
57. Zaviacic M, Sidlo J, Borovský M. Prostate specific antigen and prostate specific acid phosphatase in adenocarcinoma of Skene's paraurethral glands and ducts. *Virchows Arch A Pathol Anat Histopathol*. 1993;423(6):503–505.
58. Kazakov DV, Stewart CJ, Kacerovska D, et al. Prostatic-type tissue in the lower female genital tract: a morphologic spectrum, including vaginal tubulosquamous polyp, adenomyomatous hyperplasia of paraurethral Skene glands (female prostate), and ectopic lesion in the vulva. *Am J Surg Pathol*. 2010;34(7):950–955.
59. De Rose AF. *Dosaggio PSA nella donna*. Milano: La Repubblica; 2011. 185 p.
60. D'Amati G. Istologia dell'apparato genitale femminile, cap 22. In: Jannini E, Lenzi A, Maggi M, editors. *Sessuologia medica-trattato di psicossessuologia e medicina della sessualità*. Milano: Elsevier Masson; 2007. 62 p.
61. O'Connell H, Sanjeevan KV, Hutson JM. Anatomy of the clitoris. *J Sex Med*. 2008; 5(8):1883–1891.
62. Puppo V. *Anatomy of the Clitoris: Revision and Clarifications about the Anatomical Terms for the Clitoris Proposed (without Scientific Bases)*. In: Helen O'Connell, Jannini, and Odile Buisson, editors. 2011. 261 p.

63. O'Connell H, Sanjeevan KV. Hutson Anatomy of the clitoris. *JM J Urol.* 2005; 174(4 pt 1):1189–1195.
64. Jannini EA, Whipple B, Kingsberg SA, et al. Who's afraid of the G-spot? *Sex Med.* 2010; (1 pt 1):25–34.
65. Pirozzi Farina F. Fisiologia dell'orgasmo femminile In: Jannini E, Lenzi A, Maggi M, editors. *Sessuologia medica-trattato di psicossessuologia e medicina della sessualità.* Milano: Elsevier Masson; 2007. 492 p.
66. Jannini E, Lenzi A, Maggi M. *Sessuologia medica-trattato di psicossessuologia e medicina della sessualità.* Milano: Elsevier Masson; 2007. 115 p.
67. Pastor ZJ. Female ejaculation orgasm vs. coital incontinence: a systematic review. *Sex Med.* 2013;10(7):1682–1691.
68. Jannini EA, Buisson O, Rubio-Casillas A. Beyond the G-spot: clitourethrovaginal complex anatomy in female orgasm. *Nat Rev Urol.* 2014;11(9):531–538.
69. Chiara Simonelli. *Psicologia dello sviluppo sessuale ed affettivo.* Roma: Carocci; 2008. 272 p.
70. Comfort A, Quilliam S. *The Joy of Sex: A Gourmet Guide to Lovemaking.* 1972.
71. Paget L. *How to Give Her Absolute Pleasure: Totally Explicit Techniques Every Woman Wants Her Man to Know.* New York: Brodway Books; 2000. 256 p.
72. Yaffe M, Fenwick E, Rosen R. *Sexual Happiness: A Practical Approach.* London: Dorling Kindersley; 1986. 320 p.
73. Godson S Agace M. *The Sex Book.* London: Cassel Illustrated; 2002.
74. Serra M. *Roy Un'immagine allo specchio.* Brescia: Tarantola Editore; 2010. 280 p.
75. Fo J. *Eiaculazione Femminile. Quanto eiaculano le donne? Apriamo il dibattito.* 2012.
76. Ragozzini D. *Pregiudizi sul Sesso Eiaculazione femminile o squirting.* 2013.
77. Bossi M. *Enciclopedia della sessualità.* Italiano: Salute Benessere Self Help; 2000. 672 p.
78. Graziottin A. *Mestruazione: una differenza di genere per eccellenza.* 2013.
79. *Pregiudizi sul Sesso. Eiaculazione femminile o squirting.* 2014.
80. *The truth about female ejaculation.* 2014.
81. Carderi A. *Squirting. L'emissione femminile. Benessere sessuale e riproduttivo della coppia.* Camogli (Ge): Congresso Nazionale Associazione Andrologi Italiani; 2013. 486 p.
82. <http://myrome.org/portal/cisti-uretrale-femminile>
83. <http://www.geocities.ws/culturaarcaica/diosasdelagua.html>