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Hysterectomy *improves* sexual response? Addressing a crucial omission in the literature

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Abstract

The prevailing view in the literature is that hysterectomy improves the quality of life. This is based on claims that hysterectomy alleviates pain (dyspareunia and abnormal bleeding), and improves sexual response. Since hysterectomy requires cutting the sensory nerves that supply the cervix and/or uterus, it is surprising that the reports of deleterious effects on sexual response are so limited. However, we note that almost all the papers we found reported that some of the women in their studies claim that hysterectomy is detrimental to their sexual response.

It is likely that the degree to which a woman's sexual response and pleasure are affected by hysterectomy would depend not only upon which nerves were severed by the surgery, but also the genital regions whose stimulation the woman enjoys for eliciting sexual response. Since clitoral sensation (via pudendal and genitofemoral nerves) should not be affected by hysterectomy, this surgery would not diminish sexual response in women who prefer clitoral stimulation. However, women whose preferred source of stimulation is vaginal or cervical would be more likely to experience a decrement in sensation and consequently sexual response after hysterectomy, because the nerves innervating those organs -- pelvic, hypogastric and vagus -- are more likely to be damaged or severed in the course of hysterectomy. However, all the published reports of the effects of hysterectomy on sexual response fail to specify the women's preferred sources of genital stimulation.

As discussed in the present review, we believe that the critical lack of information as to the women's preferred sources of genital stimulation is key to accounting for the discrepancies in the literature as to whether hysterectomy improves or attenuates sexual pleasure.

Introduction

The following quotes from women after total hysterectomy and bilateral oophorectomy are consistent with anecdotal comments to the present authors by women who have undergone this surgery:

Post-surgery: "...I notice a distinct LACK of vaginal sensations with intercourse and no longer experience the intense vaginal orgasms as I had when my cervix was intact" ¹.

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Pre-surgery: “He (the surgeon) said, the cervix has very few nerve endings and is of no sexual benefit.”

Post-surgery: “Now my vagina feels strange...I have no libido, and there is no sensation in my nipples. Penetration is uncomfortable, and my orgasms are weaker....”².

Post-surgery: “I will never again enjoy the intense internal orgasms I experienced when my uterus and cervix were intact”².

Post-surgery: “Sex...would have been great if I were still able to experience uterine contractions and cervical pressure...”².

It is currently estimated that more than 600,000 hysterectomies per year (an average of more than one per minute) are performed in the United States³. These are performed for actual and possible malignancies and benign conditions, the latter of which include pelvic pain, dyspareunia, uterine fibroids (leiomyomata), adenomyosis, endometriosis, and menometrorrhagia. The types of hysterectomy include total (i.e., removal of uterus and cervix) and subtotal (“supracervical” or “supravaginal,” i.e., removal of uterus), with or without unilateral or bilateral oophorectomy. The surgical routes include abdominal, vaginal, and laparoscopic. Physical, more than psychological, factors influencing these choices have been reviewed recently by Sutton⁴.

Effects of hysterectomy on sexual response

A common concern among women who undergo hysterectomy is the possible side effect of the surgery on their sexual response. In the present paper, we review the literature on the effects of hysterectomy on sexual response since the review by Zussman et al in 1981⁵. These authors took an extreme position regarding a predominant role of physiological rather than psychological factors in sexual response after hysterectomy. In their 1981 review paper they observed that “Recent studies conducted in the United Kingdom showed that 33% to 46% of women report decreased sexual response after hysterectomy-oophorectomy. The prevailing theory in the United States for over 30 years in counseling women is that such decreases are infrequent and, if they do occur, are psychogenic. The postulates of the psychogenesis theory were examined and found no longer tenable in the light of physiologic knowledge of female sexuality, which suggests that when sexual response is diminished after the surgery, hormonal changes (including ovarian androgen) and anatomic changes (removal of the cervix-uterus as a trigger for orgasm in some women) may be etiologic factors”⁵. However, subsequent studies reported that psychological factors also play a significant role. For example, depression was reported to have a detrimental effect not only on post-operative symptoms but also on various aspects of sexual functioning^{6, 7}.

In this review, we do not consider reports that are based upon hysterectomy performed for malignancy. The following is a brief summary of the reports in which the predominant effects of hysterectomy are a decrease in dyspareunia and no changes in sexual activity (frequency of intercourse and orgasm) or libido (sexual desire). One study reported that subtotal (“supravaginal” or “supracervical”) hysterectomy is more likely to preserve orgasmic response than total hysterectomy⁸. While Table 2 summarizes the reported *significant* effects, it must be emphasized that at least some deleterious effects of hysterectomy were reported in almost all the papers and therefore should not be disregarded.

In an extensive review of the literature, Maas et al⁹ concluded that “The research on the effect of hysterectomy that has been performed to date is not conclusive.” These authors point out that while a majority of women report an improvement of sexual functioning after hysterectomy, this may be the result of the relief of symptoms (such as vaginal bleeding and

dyspareunia) from the diseased uterus. They also conclude that a minority of women develop sexual dysfunction as a result of hysterectomy, and that more research is needed to clarify the issue of the effect of hysterectomy on sexual response.

Table 1 summarizes the literature on hysterectomies performed for benign conditions, which includes 20 papers published since 1977 that specifically tested the effects of hysterectomy on sexual response, e.g., reporting the effects of hysterectomy on orgasm (frequency and intensity), sexual activity, libido (sexual desire), vaginal lubrication, and/or “sexual function,” which some papers use as a general descriptor without definition.

Table 2 summarizes, in greater detail, the findings in these papers.

It is difficult to discern a consistent pattern among these reports, perhaps due to factors that include: the complexity of the innervation of the sexual system, the various types and surgical routes of hysterectomy, the various sources of sexual stimulation, the presenting symptoms (e.g. pain and/or bleeding), the surgical methodology -- the route of access (vaginal, abdominal, laparoscopic), the degree of nerve sparing, the extent of the surgery (e.g. whether the cervix and/or ovaries were removed in combination with the uterus), the psychological state of the women pre- and post-surgery (e.g., whether depressed), their physiological state (e.g. pre-menopausal), and/or the nature of the data collected (e.g., the questionnaires administered).

In addition to the alleviation of the discomfort of pain and bleeding by hysterectomy, resulting positive psychological factors such as elimination of anxiety over cancer risk and unwanted pregnancy may trump negative factors, especially possible loss of genital sensibility¹⁰. Rhodes, et al⁷ stated, “This symptom relief may have led to increased sexual enjoyment and increased orgasm frequency. Furthermore, in terms of sexual functioning, the improvements due to symptom relief may have outweighed any lost sensation due to removal of the cervix.”

Multiple factors have been proposed as bases for deleterious effects of hysterectomy on sexual response. These include: a) uterus negatively affecting some women for whom uterine contractions were an important aspect of orgasm, b) scar tissue preventing a full ballooning of the vagina, which may make intercourse difficult because the vagina is less expansive, and c) internal scarring or nerve damage causing pain or interfering with feeling sexual pleasure. Furthermore, after a hysterectomy, d) the reduced quantity of tissue resulting in diminished vasocongestion may reduce sexual arousal as well as the probability of multiple orgasms, and hysterectomy may affect sexual function by e) disrupting local nerve supply, vaginal blood flow, and anatomical relationships, which could have a negative effect on overall pelvic function^{11–14}.

In addition to these factors, the pathology for which the hysterectomy is performed may differentially affect sexual response. Thus, in their recent study, Peterson, et al.¹⁵ concluded, “Women who had a hysterectomy due to endometriosis reported more difficulty and less satisfaction with orgasm than women who had a hysterectomy for other reasons.” Furthermore, “...there was no significant difference in changes in women’s perception of their sexual functioning pre- and post-hysterectomy based on whether the women received no BSO (bilateral salpingo-oophorectomy), a BSO with HRT (hormone replacement therapy), or a BSO without HRT”¹⁵.

Based on the other papers that we reviewed, it is also not possible to draw a conclusion as to the effect on any of the sexuality measures of oophorectomy with or without hormone replacement therapy (HRT). Almost half the papers do not specify whether HRT was administered, other papers report that some of the women in their study received

oophorectomy, and some received HRT, but contingent relationships are not specified between these procedures and any of the sexuality measures. If we consider just the subgroup of papers in which hysterectomy was performed for myoma or endometriosis, or any non-malignant condition for which hysterectomy was performed, the lack of reported contingencies among these variables weakens still further our ability to relate any of these procedures to their effects on the reported types of sexual responses.

Research on genital sensibility

After the above consequences of hysterectomy are considered, there remains the issue specifically of genital sensibility after hysterectomy, for which there is a dearth of experimental evidence. To address this issue, let us consider first the evidence of clitoral, vaginal and, cervical innervation and sensibility in women in whom these afferent pathways are intact. Obvious questions are: a) what is the evidence of innervation of the genital organs, b) are the genital organs sensitive, c) does hysterectomy affect the sensibility of the genital organs, and d) do hysterectomy-induced changes in genital sensibility account for effects of the surgery on sexual responses? We address these questions in sequence, as follows:

a) Evidence of innervation of the genital organs

Zussman et al⁵ were of the opinion that the vagina has no nerve endings. They agreed with the opinion of Clark¹⁶ and Singer and Singer¹⁷ that internal genital sensibility was due not to stimulation of the vagina and cervix *per se* but rather to the pleasurable sensation resulting from penile thrusting-induced movement of the peritoneal membranes that surround the uterus and its supporting ligaments.

By contrast, Dimond and Montagna¹⁸ stated, “Despite previous reports to the contrary, the human vagina and cervix are profusely innervated.” Krantz¹⁹ had described an unusual wavy pattern of nerve fibers in the vaginal adventitia (i.e. the connective tissue covering of the vagina in the abdominal cavity) and in the vaginal musculature, and suggested that the wavy pattern could provide a means by which the nerve endings could adapt to the extreme distortion resulting from labor and delivery. Subsequently, Blank et al²⁰ reported that the vagina and cervix contain high concentrations of NPY and VIP-immunoreactive nerves, localized around the vascular and nonvascular smooth muscle. More recently Pauls et al²¹ described vaginal nerves located regularly throughout the anterior and posterior vagina, proximally and distally, including apex and cervix. They found no vaginal location with increased nerve density.

A type of nerve ending (termed “Merkel receptor”) that is specialized for responding to steady pressure was found in the vaginal introitus region²² but not elsewhere. In that region, a clear difference in innervation of the deep (submucosal) tissue layer of the vagina was reported. The connective tissue of the anterior wall was found to be richly innervated, by contrast with the posterior wall, which was more sparsely innervated²².

The division of labor among the genital sensory nerves is basically as follows. In women, the hypogastric nerves convey afferent activity from the uterus and cervix^{23–27}, the pelvic nerves convey afferent activity from the vagina^{27, 28}, and the pudendal nerves convey afferent activity from the clitoris^{25, 27, 29, 30}. More specifically, DeLancey²⁴ claims that “blockade of the pudendal nerve abolishes the sensation to pain over an area including the labia majora, labia minora, clitoris, and vestibule as far as the level of the hymenal ring.” The mons pubis, labia, and vulvar skin receive afferents via the ilioinguinal and genitofemoral nerves, that enter the spinal cord at L1 and L1-2, respectively. The pudendal and pelvic nerves enter the spinal cord at Sacral levels 2–4 and the hypogastric nerves travel

in the sympathetic chain and enter the spinal cord at Thoracic levels 10–12^{28, 30}. Recently, evidence has been presented that a fourth pair of nerves – the Vagus – convey afferent activity from the cervix and vagina³¹.

b) Evidence that vagina, cervix, and clitoris are sensate

Kinsey et al³² stated a conclusion about the ability of women to perceive vaginal and cervical stimulation that, remarkably and surprisingly, diametrically contradicted their own data. Regarding vaginal sensibility, they stated, “In view of the evidence that the walls of the vagina are ordinarily insensitive, it is obvious that the satisfaction obtained from vaginal penetration must depend on some mechanism that lies outside of the vaginal walls themselves.” Then, regarding cervical sensibility, they stated, “All of the clinical and experimental data show that the surface of the cervix is the most completely insensitive part of the female genital anatomy. Some 95 percent of the 879 women tested by the gynecologists for the present study were totally unaware that they had been touched when the cervix was stroked or even lightly pressed [their Table 174³²]. Less than 5 per cent were more or less conscious of such stimulation, and only 2 per cent of the group showed anything more than localized and vague responses (their p. 584).” In contradiction to their own claim, examination of their Table 174 shows a marked difference in response to “pressure...tested by exerting distinct pressure at the indicated points with an object larger than a probe” compared to “tactile” stimulation, which was “made with a glass, metal or cotton-tipped probe with which the indicated areas were gently stroked.” In response to this pressure stimulation, 89 percent of the 879 women in their study responded to stimulation of the anterior vaginal wall, 93 percent of the women responded to stimulation of the posterior vaginal wall, and 84 percent of the women responded to stimulation of the cervix! In arriving at their conclusion, the authors focused on the gentle tactile stimulation of the vagina and cervix, while ignoring the effect of pressure stimulation that is obviously a much more relevant stimulus during penile-vaginal intercourse. Despite the above clear evidence of vaginal and cervical sensibility to adequate physical stimulation, it nevertheless seems to be a rather widely-held belief that the vagina and cervix are insensate.

There is other evidence of functional sensory activity from the uterine cervix. In one study³³ 77 percent of 137 women showed reflex contraction of the bulbocavernosus muscle, which produced clitoral movement or contraction of the adductor muscle of the thigh in response to touching the cervix during the Pap smear procedure. In another study³⁴ electrical stimulation via electrodes in the cervical canal elicited desynchronization of the cortical alpha rhythm during which the women reported that they perceived the stimulation. With repeated testing that systematically lowered the stimulation intensity, the women became aware of the cervical stimulation at intensities that previously were subthreshold for their perception.

Perry and Whipple³⁵ found that the anterior wall of the vagina, i.e. the region near “12 o’clock” (with the woman lying supine), was most sensitive to physical stimulation, and stimulation through that region (which they termed the “Grafenberg spot” or “G spot”) was more likely to produce orgasm than stimulation of other regions of the vagina. The posterior wall, near “6 o’clock,” was least likely to elicit orgasm. In a separate set of experiments, we³⁶ found that in the case of another type of response to vaginal (self-) stimulation in women, i.e., suppression of pain, mechanical stimulation of the anterior wall of the vagina was more effective in suppressing experimentally-induced pain (measured by application of calibrated, gradually increasing, compressive force to the fingers) than was stimulation of the posterior wall of the vagina.

Alzate and Londono³⁷ described the procedures that they used to perform a study of sensitivity of vaginal regions in women. Among 48 women, 94 percent reported vaginal erotic sensitivity. Among 30 women tested who experienced orgasm or came close to

orgasm, 73 percent showed maximal response to stimulation of the upper half of the anterior vaginal wall, and 27 percent had maximal response to stimulation of the lower half of the anterior vaginal wall. In 30 percent another zone, whose stimulation could elicit an orgasmic response, was in the lower half of the posterior vaginal wall (some subjects showed more than one zone of maximal response). The authors claimed that very few reported a pleasant sensation on the cervix or posterior vaginal fornix.

However, in our laboratory, in a study in which more than 20 women applied mechanical pressure directly to the cervix using a custom-designed stimulator that was attached to a diaphragm fitted to the cervix, most of the women reported feeling the stimulus, and we were able to measure their threshold of sensitivity to the pressure³⁸. Some of the women who had suffered a “complete” spinal cord injury at or above Thoracic level 10 could feel the stimulation of the cervix, although they were less sensitive to the stimulation than non-injured women. Two of the women stated that when they pulled the stimulator outward, away from the cervix, the suction generated by the diaphragm against the cervix felt unusual and pleasurable. When we recorded brain activity using fMRI, in response to cervical self-stimulation in these women, we found activation of the region of the nucleus of the solitary tract, to which the Vagus nerves project, in the medulla oblongata of the brainstem³¹. In able-bodied women, we are finding that cervical self-stimulation activates the genital sensory cortex (specifically, the paracentral lobule; Figure 1)³⁹.

Consistent with this description of pleasurable response to cervical stimulation, Cutler et al⁴⁰ reported that 35 percent of 128 healthy women stated that they experience orgasm from penile stimulation of the cervix during sexual intercourse. In the same study, 63 percent of the women reported that they experience orgasm from vaginal stimulation and 94 percent reported that they experience orgasm from clitoral stimulation. The authors did not report the proportions and varieties of specific individuals’ combinations among these stimulation sources.

Using a different method for measuring sensitivity – mild electrical stimulation at different intensities – Weijmar Schultz et al⁴¹ tested the sensitivity of different regions of the vagina. They termed the most anterior region of the vagina (i.e. the region closest to the clitoris) “12 o’clock” and the region closest to the anus “6 o’clock.” They found that the 12 o’clock region of the vagina was most sensitive. All the internal vaginal areas around the clock were less sensitive than the clitoris. The clitoris had slightly greater sensitivity than the labia minora. The labia majora were slightly more sensitive than the clitoris and labia minora. The abdominal skin and the back of the hand were more sensitive than all the above genital regions. A particular type of sensory receptor -- Pacinian corpuscles -- which are specialized to respond to pressure and vibration, were found to be present in larger numbers in the clitoris and prepuce than in the labia minora¹⁹. The clitoris has been characterized as the “most densely innervated part of the human body”⁴².

c) Evidence that hysterectomy affects genital sensibility

Based upon the above-cited evidence of innervation of the clitoris, vagina, and cervix, it would not be surprising if responses to genital stimulation are attenuated by hysterectomy. Several studies have reported such effects.

Thus, Hasson⁴³ opined, “The cervix is not a useless organ and should not be removed during hysterectomy without a proper indication.... Loss of a major portion of the uterovaginal (Frankenhauser’s) plexus through excision of the cervix is bound to have an adverse effect on sexual arousal and orgasm in women who previously experienced internal orgasm.” Such effect had been claimed previously, i.e., “In 1973, in a personal communication, Masters observed: ‘many women certainly describe cervical pressure as a trigger mechanism for

coital responsivity. Such women can be and occasionally are handicapped sexually when such a trigger mechanism is removed surgically”⁵. The same authors also stated “For some women, the quality of orgasm is related to the movement of cervix and uterus, and for these women the intensity of orgasm is thus diminished when these structures are removed. For other women, orgasm is achieved mainly by clitoral stimulation so that the loss of internal structures does not have a comparable effect”⁵. Consistent with this statement, measurement of vaginal and clitoral sensitivity 3 months after hysterectomy, compared to immediately before the surgery, showed that there was a small but significant reduction in sensitivity to cold and warm stimuli at the anterior and posterior vaginal wall, whereas clitoral sensitivity was not affected⁴⁴. An effect of cervical excision on sexual response was demonstrated by Kilkku et al⁸, who reported in a study of 212 women that removal of the cervix in total hysterectomy was associated with a lower incidence of orgasms than subtotal hysterectomy, in which the cervix is spared. Thus, the percent of women experiencing fewer than 1 orgasm per 4 coital events increased significantly after *total* hysterectomy from 29.7 pre-surgery to 46.7 at 12 months post-surgery, whereas at the same interval after *subtotal* hysterectomy, there was a non-significant change from 28.6 to 32.0, respectively. A recent study in the UK based on a 5-year-post-surgery questionnaire sent to women who had been treated surgically for “dysfunctional uterine bleeding” supported this difference in the effects of total and subtotal hysterectomy. Of the more than 8900 women who responded to questions relating to their psychosexual function, “...more women reported having bothersome psychosexual function [i.e., “loss of interest in sex, difficulty in becoming sexually excited, and vaginal dryness”] than did the women who had a less invasive operation [i.e., transcervical endometrial resection/ablation, or subtotal hysterectomy with or without prophylactic bilateral oophorectomy]. Hormone therapy, although related to surgical method, did not reduce this long-term detrimental effect. The odds were particularly high amongst women with concurrent bilateral oophorectomy”⁴⁵.

By contrast, Roussis et al⁴⁶ in a questionnaire study of 400 women within 3 years of hysterectomy of various types, including total abdominal and supracervical, concluded that responses that pertained to libido, sexual activity, or feelings of femininity did not reveal significant change from pre-hysterectomy levels. A similar conclusion was reached by Farrell and Kieser⁴⁷, who reviewed 18 reports in the literature. They concluded that while the “outcome measures were usually not validated and most studies did not consider important confounding factors.... Most studies in this review showed either no change or an enhancement of sexuality in women who had a hysterectomy”.

In a meta-analysis entitled, “Role of the cervix in sexual response: evidence for and against,” Grimes⁴⁸ in 1999 emphasized methodological shortcomings of all the relevant studies, concluding “The evidence both for and against a role for the cervix is weak,” and that “If the issue is truly important for more than half million U.S. women who have a hysterectomy each year, then gynecologists have an ethical obligation to conduct a large, definitive randomized controlled trial.” Thus, there is no clear evidence that the cervix plays no role in sexual response. Few studies consider or ask women about the role of the cervix in their sexual response. In the case of subtotal hysterectomy, cervical sensibility would likely be compromised by damage to its three different pairs of sensory nerves, and, of course, abolished by total hysterectomy. Thus absence of evidence of a sensory role for the cervix in sexual response should not be construed as evidence of its absence.

d) Do hysterectomy-induced changes in genital sensibility account for effects of the surgery on sexual response?

We propose the following hypothesis toward reconciling the discrepant claims of the effects of hysterectomy: There is a glaring omission in all the literature that we have reviewed on the effects of hysterectomy on sexual response – it is the women’s report of their preferred

source of genital stimulation. The importance of this factor has been pointed out by Goetsch⁴⁹: “The locus of orgasm may affect the impact of hysterectomy.... The most frequent sites were reported to be the clitoris (by 30% of respondents), the vagina (11%), and the uterus or uterus and vagina (8%)”. (These percentages do not sum to 100% because the question was evidently asked as to the locus of orgasm for each of these sites individually). While this refers to the body site at which the orgasm is *perceived*, it does not address the crucial question of the body site from which the orgasm is *elicited*, i.e., specification of an individual woman’s preferred source of stimulation. Thus, if a woman prefers clitoral stimulation, we would expect no deleterious effect of hysterectomy on sexual response. However, if she prefers vaginal and/or cervical stimulation, sensibility of those organs might be compromised by the surgery. After taking into account the effects of hysterectomy on reducing pain and bleeding, we believe that the effects of hysterectomy on sexual response will be related to the remaining sensibility of the cervix, vagina, and clitoris. The insufficiency of data on genital sensibility in relation to sexual response has been pointed out by Mokate, et al¹⁴: “Evidence is lacking for sexual dysfunction caused by the disruption of local nerve...supply.” Taking the dual factors of genital sensibility and preferred source of stimulation into consideration would, we believe, play a significant role in accounting for the discrepant reports of the effects of hysterectomy on sexual response.

Conclusion

We conclude that variability of the reported effects of hysterectomy on sexual response may depend on whether the surgery desensitizes a woman’s preferred genital site of stimulation. The studies that we review herein almost universally fail to address this contingency. Further research that takes both these factors into account jointly may help to reconcile the reported variability of the effects of hysterectomy on sexual response.

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Figure 1. Localization of cortical sensory response to self-stimulation of the uterine cervix. The arrow points to the response in the paracentral lobule, adjacent to the post-central gyrus. Other activity is related to the hand movement used to apply the stimulation. Coronal view; group data, N=11.

Effects of Hysterectomy

Table 1

Summary of findings reported in the papers regarding the variably reported outcomes of hysterectomy including: effects on dyspareunia, libido, sexual activity, vaginal lubrication, orgasm frequency, orgasm intensity, and “sexual function.”

*Note that in the last column – “Undesirable Effects On:” -- Any individual study reporting on at least some women who experienced deleterious effects after hysterectomy, whether or not statistically significant, was included in this category. We believe that it is important to identify and report incidence of deleterious effects of hysterectomy on any individuals. Since very few papers elaborated on these deleterious effects, we could not distinguish whether the women who, for example, experienced dyspareunia after hysterectomy developed this condition after the surgery or if the condition was present preoperatively but not ameliorated with surgery.

Summary of 20 papers (1977 – 2007)					
Effect	Increase	Decrease	No Change	Variable	Undesirable Effect On:
Dyspareunia	0	8	2	0	12
Sexual Activity	2	1	10	1	7
Orgasm Frequency	1	2	5	0	7
Orgasm Intensity	1	0	3	1	3
Vaginal Lubrication	1	0	4	0	6
Libido	3	1	10	0	13
Sexual Function	2	1	2	0	2

Effects of Hysterectomy on Sexual Response

Abbreviations: + = et al; A = Abdominal; Bi/Unil= Bi/Unilateral; HRT = Hormone Replacement Therapy; L = Laparoscopic; NC = No Change; SC = Supracervical; SCH = Supracervical Hysterectomy; SF = “Sexual Function”; T = Total; TAH = Total Abdominal Hysterectomy; U = Unspecified; V = Vaginal

Table 2

Author	Year	Hysterectomy							Oophorectomy				HRT post-op	Orgasm						Libido			Vaginal Lubrication			Dyspareunia			Sexual Activity			Sexual Function																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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Author	Year	Hysterectomy						Oophorectomy				HRT post-op	Orgasm						Libido			Vaginal Lubrication			Dyspareunia			Sexual Activity			Sexual Function																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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^a“ease of arousal”

^b“desire for intercourse”

^cTAH patients experienced worse post-op SF than SCH patients

^dApproximately equal numbers of patients showed an increase, decrease, or no change

^eLibido and “interest in sex” significantly increased for patients who remained sexually active

^fHRT was administered to 91% of bilateral-salpingo-oophorectomy group

^g“interest in having sex”

^hNine of 14 had more difficulty experiencing climax after hysterectomy

ⁱ63 continuously; 15 sporadically

^jApproximately equal numbers of patients showed an increase, decrease, or no change

Additional articles summarized in Table 2 but not in the text: References 50-60.

Note: All the following studies omit: a) the women's preferred source of genital stimulation, and b) whether the surgery was nerve-sparing