Psychosexual health 5 years after hysterectomy: population-based comparison with endometrial ablation for dysfunctional uterine bleeding

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Abstract

Background We report a population-based comparison of psychosexual health 5 years after contrasting amounts of surgical treatments for heavy periods [dysfunctional uterine bleeding (DUB)]. Women's fears about sexual function after hysterectomy might not be unfounded. The psychosexual problems may return and/or develop with time. The removal of ovaries at the time of hysterectomy is associated with greater deterioration of self-reported sexual function. Surgical menopause significantly impairs sexual wellbeing. We failed to observe uniform beneficial effects of hormone replacement therapy (HRT) on reported psychosexual health.

Objective To compare self-reported bothersome sexual function; loss of interest in sex, difficulty in becoming sexually excited and vaginal dryness 5 years after surgical management of DUB [transcervical endometrial resection/ablation (TCRE) or subtotal and total hysterectomy, with and without prophylactic bilateral oophorectomy (BO)].

Design Prospective cohort study up to 5 years post-surgery for DUB, TCRE or hysterectomy, with or without BO.

Setting Over 400 NHS and private hospitals in England, Northern Ireland and Wales.

Cohort Of 11 325 women who responded to the 5-year questionnaire, over 9500 (84%) were valid cases, and over 8900 (94%) did complete the questions relating to psychosexual function. Most were between the ages of 39 and 45 years, married or cohabiting.

Main outcomes Self-reported experience of bother, recorded as 'some', 'severe' and 'extreme', to questions on (1) libido loss, (2) difficulty with sexual arousal, and (3) vaginal dryness during the past 4 weeks, 5 years after surgery.

Results Five years after surgery for DUB, the crude and adjusted prevalence of psychosexual problems was higher after hysterectomy than after TCRE. Amongst the women with concurrent BO, the age- and HRT-adjusted odds ratios for extreme psychosexual problems were increased by 80% (libido loss), 82% (difficult sex arousal) and 69% (vaginal dryness) compared with TCRE.

Conclusions Five years after hysterectomy more women reported having bothersome psychosexual function than did the women who had a less invasive operation. Hormone therapy, although related to surgical method, did not reduce this long-term detrimental effect. The odds were particularly high amongst women with concurrent BO. Women should be advised that they might be at higher risk of psychosexual problems following hysterectomy, compared with a less invasive procedure.

Introduction

One in five UK women will have undergone hysterectomy by age 60. Forty per cent of hysterectomies are for dysfunctional uterine bleeding (DUB, i.e. heavy periods without obvious cause), performed to improve women's quality of life. Forty per cent of hysterectomies in women aged under 50 are accompanied by prophylactic bilateral oophorectomy (BO) (castration) while some ovarian failure occurs in one-third of patients even when ovaries are preserved. It is believed that hysterectomy may improve sexual function, regardless of the method of surgery and/or preservation of cervix, as it eliminates heavy menstrual bleeding. Research into sexual function after hysterectomy includes only women who were sexually active both before and after surgery. Women's concern about hysterectomy, often after surgery, includes its effect on their sexual function. We compare three treatments for DUB and self-reported aspects of psychosexual health 5 years after the operation.

Each year more than 70 000 UK women choose to have a hysterectomy to treat benign cause menorrhagia.[1] The NICE (National Institute of Clinical Excellence – a government body to make formal treatment guidelines on cost-effective grounds) recommendation on the use of microwave endometrial ablation is possibly intended to reduce the number of unnecessary and expensive hysterectomies in favour of endometrial removal.[2] NICE are currently working on new guidelines on treating heavy menstrual bleeding.[3] Hysterectomy remains one of the few operations that have not been superseded by a less invasive technique.[4] The current concerns of NICE relate to the second-generation resection methods (microwave and thermal balloon), while this study, because of its timing, concerns roller ball or laser ablation. We assume that, as both remove the endometrium alone, the outcomes will be comparable. Recent evidence from a sample of Trusts suggest that Hysterectomy rates for menorrhagia is falling in England and Wales,[5] possibly due to the increased use of a levonorgestrel coil for heavy menstrual bleeding. This remains to be validated.

These data show that women are less likely to be readmitted to hospital after hysterectomy, but overall the effects on the symptoms of heavy bleeding are comparable.[6] Hysterectomy for DUB has many effects, both intended and incidental. Lesser surgery like TCRE may have fewer effects, as fewer organs are removed. The net effect of making this choice with many important incidental outcomes, but complex biological, psychological and social pathways, is obscure – particularly on sexual function. Balancing the short-term benefits with long-term consequence is therefore problematic for

women. In so far as sexual function is important then a clear comparison with lesser surgery should assist this process.[7]

In the 1980s, there were suggestions that fears related to postoperative sexual function were the most frequent pre-hysterectomy anxiety.[8,9] Since then, randomized controlled trials and cross-sectional studies indicated that the postoperative improvements were more likely than any deterioration.[10,11] The findings were that women who have sex, have sex more frequently after hysterectomy[12,13] and concluded that sexual wellbeing improves after hysterectomy.[14] But while to some, more sex is likely to be equivalent to improved sex life, female sexual functioning may be more a matter of quality rather than quantity,[15] and understanding sexuality after hysterectomy requires care in interpretation of data.

Moreover, sexual wellbeing may not be the same as the absence of sexual dysfunction. The physiology (mechanics) of sexual function may be an important issue with men, while women may be more concerned with psychology, such as emotional intimacy.[16] An estimated 13–37% of women report deterioration in their sex lives after hysterectomy.[17] Shortening of the vaginal vault after hysterectomy, particularly after a horizontal closure (anterior to posterior), could result in dyspareunia,[18] while oestrogen and testosterone deficiency caused by hysterectomy with BO may cause vaginal dryness and libido loss.[19] Even when ovaries are preserved, hysterectomy may result in ovarian failure and increased menopausal symptoms, including vaginal dryness.[20] It has been suggested that removal of the cervix (total hysterectomy) inhibits internal orgasms.[21] Vaginal hysterectomy has been implicated in greater sexual morbidity than abdominal.[22] A recent research paper from Holland, reporting improvement after hysterectomy, resulted in an animated discussion in the BMJ on sexual function after hysterectomy. The paper included 310 women with no controls and no information on ovarian ablation.[23] Clearly, there is a need to investigate the matter further.

The limited evidence is conflicting and points towards equally plausible mechanisms for improvement as well as for deterioration. Hys-terectomy for a benign indication, such as DUB, eliminates inconvenient, excessive or prolonged bleeding and removes the threat of unwanted pregnancy. But considering its plausible detrimental effects on (1) ovarian function (hormonal), (2) damage to the pelvic plexus' innervations, ligaments and tissue (neuromechanics), and (3) injury to the remaining pelvic organs (general health), what this actually does to sexual wellbeing in aggregate, in comparison with a less invasive conservative surgical treatment remains unknown.

This is the first large epidemiological account of self-reported psychosexual health 5 years after highly contrasting main types of surgery for DUB.

Participants and methods

The data come from the ongoing VALUE[24] and MISTLETOE[25] project. These prospective cohorts were designed to investigate the medium and long-term risks of two types of gynaecological surgery for benign cause menorrhagia. The MISTLETOE arm recruited a national sample of unselected women who had less invasive, conservative surgery – transcervical endometrial resections/ablations (TCRE) from April 1993 to September 1994; while the VALUE arm recruited as control women who had hysterectomy from October 1994 to September 1995. Over 400 gynaecologists provided baseline data (operative, at discharge and at 6-week post-surgery). Women who were pre-menopausal, and under 60 years of age, free of cancer and with the DUB indication were surveyed at 1, 3 and 5-year postoperation by postal questionnaires, asking about their satisfaction with the procedure, and various aspects of health and quality of life.

The cohorts were unselected, but inevitably largely determined by the gynaecologists. The TCRE cohort was selected to assess a new procedure against a similar cohort given normal treatment – hysterectomy. The samples were selected as a complete enumeration from participating hospitals, which constituted the large majority of treatment facilities in the UK apart

from Scotland. Eighty per cent of all TCREs performed were included. For hysterectomies it is likely that 45% were included, although it is difficult to be certain as there might have been some selection by indication. Busy staff undertaking a routine operation cannot be expected to submit details with the same energy as for a new procedure, but this may introduce bias.

In the validation process we reviewed random hospital case note samples. When compared with the study sample newly identified cases (1431 women compared with 10 832 reported cases) differed only ($P < 0.05$) with a higher likelihood of conserved ovaries (OR = 1.2), major haemorrhage (OR = 2.1) and postoperative complications before discharge (OR = 3.1). Comparing case note records of the same women with study responses suggested good agreement on all data recording (Cohen's $\kappa > 0.6$), except moderate disagreement on indication for surgery DUB or pelvic mass (κ 0.4–0.6) and poor agreement on fibroids and postoperative complications ($\kappa < 0.4$), for reasons mentioned above. Some residual underestimation of risk of poor health in the hysterectomy group remains possible due to this response bias. The conservative surgery group (TCRE) had a higher prevalence of recorded co-morbidity (14%) than the hysterectomy groups (3%) at surgery*, not obviously protective for subsequent sexual malfunction. Selection was however minimized as a consequence of this efficient design, including the largest follow-up series for both procedures to date, and there is no evidence of preferential selection of healthier women in the less invasive groups.

Women in the TCRE group were part of a gynaecological audit and hence permission for follow up was not sought, while those having hysterectomy were asked for this permission.

With ethical approval the 1-year follow-up was a sensitive communication in which the permission of all women was (again) sought. A handful of women objected, and were responded

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*Medical history recorded as comorbidity included asthma, diabetes, hypertension, heart, lipid or clotting disorders, arthritis, cirrhosis, gross obesity, previous gynaecological operations, gut disease and CNS disorders.

to with a personal communication with their consultant. Response to this follow-up was treated as consent.

Ethical approval has been obtained from ethical committees of six district health authorities and the London School of Hygiene and Tropical Medicine (LSHTM). The British Medical Association (BMA) and the RCOG approved the study.

Objectives and outcome measures

In this paper, we use data on psychosexual function that were collected by the 5-year follow-up questionnaire. We asked women how much they were bothered with (1) loss of interest in sex, (2) difficulty in becoming sexually excited and (3) vaginal dryness during the past 4 weeks. The bother impact was measured on a four-point Likert scale ('not at all', 'a little', 'quite a bit', 'extremely'), and these responses were coded and analysed to reflect the presence or the absence of degrees of the problem. 'Some' problem included 'a little' plus 'quite a bit' plus 'extreme'. 'Severe' problem included 'quite a bit' plus 'extreme'. 'Extreme' problem included 'extreme' bother only.

The exposure of interest was the type of surgery. We compared two unselected groups of women who had hysterectomy, with and without BO, with the TCRE group. The TCRE group were selected by practicing gynaecologists interested in performing a less invasive procedure at the time. In other respects the groups were comparable, except that those with BO were somewhat older. Women were excluded from analysis if the method of hysterectomy or ovarian status were unknown, or if their TCRE operation was superseded by a subsequent hysterectomy.

Confounders

At the time of surgery, the three subgroups of women had mean ages (standard deviation) of TCRE 42 (5.47), hysterectomy with at least one ovary preserved (hereafter referred to as 'hysterectomy') 39 (5.37), hysterectomy with both ovaries removed (BO) 45 (5.23); mostly married

or cohabiting (92, 91, 91%). Age was *a priori* considered to be a confounder.[26] Hormone replacement therapy (HRT) was considered to be a function of surgery, possibly on the causal pathway for some women, and not a confounder. But clearly the changing role of HRT might be significant[27] and hence adjustment for HRT use might be more relevant to contemporary women treated for DUB, who may not use HRT for anything but acute menopausal symptoms.[28] We have, therefore, analysed the independent effect of HRT on psychosexual wellbeing, and its interactions with age and surgery. As expected, women with BO had the highest long-term use of HRT (81%), followed by women who had hysterectomy (29%) and women who had TCRE (20%).

Analysis

Stata 8.0 has been used for statistical analysis of the data. Univariate logistic regression looked at the association of each outcome with each exposure, and a multivariate regression analysis was carried out, controlling for age and HRT effects.

Results

There were 11 325 respondents to the 5-year survey (Table 1). This represents approximately 55% of the original cohort. Response rates did not differ significantly between the VALUE and the MISTLETOE cohorts. A total of 1748 respondents were excluded for having had repeat surgery (358 repeat TCRE, 1366 from TCRE to hysterectomy and 24 an unknown type of follow-up surgery). Another 30 women were removed because their ovarian status was not reported and 626 (libido loss), 719 (difficult sexual arousal) and 692 (vaginal dryness) women did not answer the three psychosexual questions. The final multivariate regression analyses covered 8774 (libido loss), 8682 (difficult sexual arousal) and 8711 (vaginal dryness) women.

Women who underwent hysterectomy, with and without BO, and regardless of the method of surgery, were more bothered with psychosexual problems on all three levels of intensity (Fig. 1). Women reported being bothered with (1) loss of libido in over 66% (hysterectomy) vs.

Table 1 Characteristics of the cohort, within each type of surgery

		Hysterectomy	
	TCRE	One or more ovaries conserved	Bilateral oophorectomy
Number of women	3845	3397	2305
Age at 5 years, mean (SD)	47.9 (5.5)	45.1 (5.4)	50.6 (5.2)
Parity			
None	224 (6.3%)	183 (5.5%)	180 (8.0%)
One to two pregnancies	1763 (49.8%)	1490 (44.7%)	1009 (44.9%)
Three or more	1555 (43.9%)	1661 (49.8%)	1058 (47.1%)
Current HRT			
Yes	765 (20.2%)	969 (29.0)	1835 (81.1)
No	3021 (79.8%)	2375 (71.0)	427 (18.9)
Marital status			
Married	2695 (91.1)	2243 (89.5)	1567 (90.7)
Single	86 (2.9)	95 (3.8)	60 (3.5)
Divorced	150 (5.1)	135 (5.4)	88 (5.1)
Cohabiting	27 (0.9)	32 (1.3)	13 (0.8)
Method of surgery			
TCRE	3845 (100)	–*	–
Vaginal	–	1087 (32.0)	147 (6.4)
Abdominal	–	2191 (64.6)	2018 (87.7)
Laparoscopic	–	116 (3.4)	135 (5.9)

*Missing data – as participants either have TCRE or hysterectomy. Those having repeat surgery are excluded from analysis.
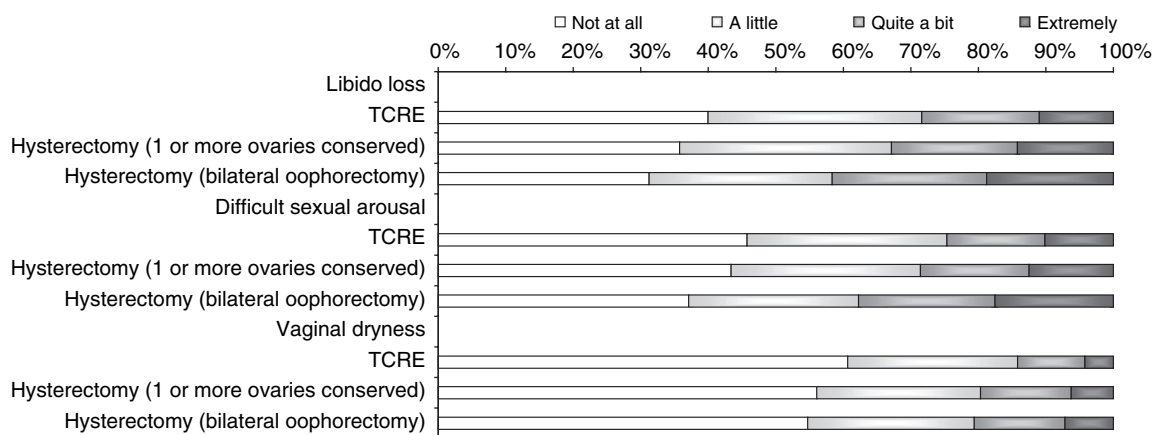
Figure 1 Please tell us how much you have been bothered with the following symptoms during the last 4 weeks.

60% (TCRE), (2) difficult sexual arousal in over 60% (hysterectomy) vs. 50% (TCRE), and (3) vaginal dryness in over 45% (hysterectomy) vs. 40% (TCRE).

As previously suggested, the prevalence of psychosexual problems was positively associated with age.[29] Older women reported being more bothered with psychosexual problems than younger women (all $P < 0.001$).

We did not observe a uniform independent effect of HRT on psychosexual health. While the current, long-term HRT use appeared protective (against reported sexual dysfunction) in older women without ovaries (over 50 years of age at surgery), it appeared to increase the psychosexual problems in younger women with ovaries (under 50 years of age; all $P < 0.001$). This variable HRT effect maybe due to the different types of HRT used by these three groups of women, or different types of women using HRT. For their menopausal symptoms women with preserved ovaries after hysterectomy are likely to be using unopposed oestrogen, but with TCRE opposed therapy for protection of any residual endometrium. Women with ovaries removed (and uterus) may be offered oestrogen plus testosterone implants straight after surgery, unless contraindicated. Therefore, it is possible that we have underestimated the observed bother after castration and overestimated it after hysterectomy, albeit only slightly (Table 2).[30] When controlling for these possible embedded interactions, the odds for extreme libido loss in

women with BO went from 77 to 80%, while the odds for severe libido loss in women with one or more ovary conserved after hysterectomy went from 30 to 29% (Table 3).

With logistic regression analysis we observed a higher risk of all degrees of psychosexual problems in women after hysterectomy than after TCRE (Table 2). Bilateral oophorectomy appeared to have a particularly debilitating effect on women's libido. The odds of being bothered with difficult sexual arousal and vaginal dryness were also higher in women with BO, particularly so for extreme problems (Table 3). In these data the method of hysterectomy *per se* did not show evidence of any differences (chi-square tests of association produced *P*-values ranging from 0.29 to 0.99, not shown).

Discussion

We have used a population-based approach to evaluate the self-reported bother impact of psychosexual problems 5 years post-hysterectomy for DUB against the less invasive, preservative surgery (TCRE). The loss of interest in sex, difficulty in becoming sexually excited and vaginal dryness were considered separately, and calculated odds were adjusted for age and HRT. We included three perceived levels of bother into our analyses, because a higher intensity of bother factor might have a stronger impact on quality of life. The women reported being more

Table 2 Odds ratios (OR) (95% confidence intervals) of being bothered with the three symptoms 5 years post-hysterectomy, with and without bilateral oohporectomy, TCRE baseline

	Hysterectomy (one or more ovaries conserved)		Hysterectomy (bilateral oophorectomy)	
	Crude OR	Age adjusted	Crude OR	Age adjusted
Libido loss				
Some	1.20 (1.08–1.32)	1.27 (1.15–1.41)	1.47 (1.31–1.64)	1.38 (1.23–1.55)
Severe	1.23 (1.11–1.37)	1.30 (1.17–1.45)	1.80 (1.61–2.01)	1.71 (1.52–1.91)
Extreme	1.35 (1.17–1.56)	1.42 (1.23–1.65)	1.88 (1.62–2.18)	1.77 (1.52–2.07)
Difficult sexual arousal				
Some	1.10 (1.00–1.21)	1.19 (1.07–1.31)	1.43 (1.28–1.60)	1.34 (1.20–1.50)
Severe	1.22 (1.10–1.36)	1.29 (1.15–1.44)	1.85 (1.65–2.08)	1.75 (1.56–1.98)
Extreme	1.26 (1.09–1.47)	1.36 (1.16–1.59)	1.88 (1.61–2.20)	1.74 (1.49–2.05)
Vaginal dryness				
Some	1.21 (1.10–1.33)	1.29 (1.17–1.42)	1.27 (1.14–1.42)	1.20 (1.08–1.34)
Severe	1.48 (1.30–1.69)	1.57 (1.37–1.79)	1.57 (1.36–1.81)	1.48 (1.28–1.71)
Extreme	1.51 (1.22–1.88)	1.52 (1.22–1.90)	1.75 (1.39–2.21)	1.71 (1.35–2.17)

Table 3 Age and HRT-adjusted* odds ratio (OR) (95% confidence intervals) of being bothered with the three symptoms 5 years post-hysterectomy, with and without bilateral oohporectomy, TCRE baseline

	Hysterectomy (one or more ovaries conserved)	Hysterectomy (bilateral oophorectomy)	Chi-squared test of heterogeneity† (*P*-values)
Libido loss			
Some	1.25 (1.13–1.39)	1.32 (1.16–1.51)	0.254
Severe	1.29 (1.16–1.44)	1.68 (1.48–1.92)	< 0.001
Extreme	1.42 (1.22–1.65)	1.80 (1.51–2.14)	< 0.001
Difficult sexual arousal			
Some	1.16 (1.05–1.29)	1.27 (1.11–1.44)	0.068
Severe	1.28 (1.15–1.44)	1.79 (1.56–2.05)	< 0.001
Extreme	1.35 (1.15–1.58)	1.82 (1.52–2.19)	< 0.001
Vaginal dryness			
Some	1.28 (1.15–1.41)	1.17 (1.03–1.33)	0.057
Severe	1.55 (1.36–1.78)	1.43 (1.22–1.69)	0.170
Extreme	1.50 (1.19–1.88)	1.69 (1.29–2.22)	0.195

*Controlling for current use of HRT in those aged over 50 and less than 50.
†A chi-squared test of heterogeneity, to see if the model categorizing the hysterectomy group on ovarian status, was a better fit than a model with hysterectomy alone.
All adjusted ORs in this table represent significant increases compared with TCRE (*P* < 0.05 at most).

bothered with psychosexual problems after hysterectomy than the women who had a less invasive operation. Bilateral oophorectomy (castration) intensified this effect. Whatever the method, hysterectomy is more likely to compromise sexual wellbeing than less invasive surgery.

As shown in Table 3, women who had castration with hysterectomy (and hysterectomy alone) reported significantly more problems than women who had less invasive surgery (*P* < 0.001). The adjusted odds of being bothered with loss of libido were higher – 32% (and 25%), severely 68% (and 29%) and extremely 80% (and 42%) – than after TCRE. The same pattern of increased odds was observed for difficult sexual arousal – 27% (16%), severely 79% (28%) and extremely 82% (35%). Vaginal dryness on milder levels was more bothersome for women after hysterectomy and respectively castration ['some' 28% (17%), 'severe' 55% (43%)], while the extreme bother impact

mimicked the previous two outcomes, with castration producing 69% (50%) higher odds than TCRE. These effects are all highly significant.

The prevalence of severe (arousal) problems among the TCRE women is around 25% (Fig. 1). If these results represent the true effect of more radical surgery then the prevalence, adjusted for age, will increase to 29% for a 20% increase in odds, to 30% for a 30%, and to 36% for a 70% increase in odds estimated above. The size of these effects on populations of women is thus important.

These results support previous research of the detrimental effects of sudden or progressive decline of circulating testosterone in innate sexual need and/or in the processing of sexual stimuli.[31] The beneficial role of testosterone, as the most potent anabolic steroid, in improving health and overall body function, including psychosexual function, in either sex is possible.[32,33] However, the exact effect of endogenous and/or exogenous androgens, and their interaction, in women's health is still unclear.[34] The Rancho Bernardo Study confirmed that surgical menopause permanently halves circulating testosterone while natural menopausal result in only a temporary reduction, with premenopausal levels being restored in the space of 2 years.[35] On the other hand, an earlier study measuring hormones in blood long term after menopause and oophorectomy found that the differences between women with and without ovaries disappeared by 5 years after surgery.[36] If the latter is correct, the bother impact we observed may have nothing to do with circulating testosterone. Future research should seek to explore this further.

Limitations

Observational cohort

This prospective observational study did not measure actual behaviour, it did not include any objective measures of reported impact and it did not assess perceptions before surgery. Moreover, response to postal questionnaire might not be able to provide the optimal measure of sexual wellbeing, which may be determined by too many chronic and transient, individual, social and interpersonal aspects. It is, nevertheless, the first ever population study to report on women's psychosexual feelings 5 years post-hysterectomy with an essentially unselected control group in the women who had less invasive surgery for the common indication.

Selection bias

The women who underwent hysterectomy could have been different from women who underwent TCRE before the surgery. The observed 5 years postoperation increased odds in psychosexual problems could have masked an improvement. But even if the effects were not entirely due to surgery, the substantive differences amongst such a large number of women so long after resolved DUB are, we believe, likely to reflect the variant levels of circulating endogenous hormones involved, rather than the decision processes that go with selecting which surgeries women should undergo.

Finally, preservation of the cervix did not appear to reduce the bother impact, as previously suggested. However, most of our women had a total hysterectomy, and only 178 women had an intact cervix, which were too few to compare.

Conclusion

Our results showed that hysterectomy appears to compromise sexual wellbeing more than less invasive surgery does, especially when accompanied with castration, and we believe that future patients and clinicians need to be aware of these results. Hysterectomy resolves menstrual bleeding, but it is major surgery with a number of significant health trade-offs. One of these could be a continuing problem with sex life, which is likely to adversely affect a women's quality of life. Psychosexual health after hysterectomy for problem periods (DUB) is of considerable concern, and less invasive surgical techniques for DUB on these data should therefore be suggested.

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