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OPINION

Impact of the menopause on the female urogenital system and sexual function

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Abstract
The menopause has a considerable impact on the female urogenital system because declining levels of sex hormones negatively affect oestrogen- and androgen-receptive tissues. This can result in the development of genitourinary syndrome of menopause (GSM). The clinical signs and symptoms of GSM are significantly detrimental to quality of life in half of all menopausal women, and the severity of the condition increases over time. The menopause also has an impact on female sexual function. This paper discusses: the normal functioning of the female urogenital system and the role of sex hormones; the impact of the menopause and ageing; and the vaginal, urinary and sexual symptoms that occur during the climacteric. It concludes with a review of assessment and treatment options that focuses on physiotherapy management.

Keywords: genitourinary syndrome of menopause, menopause, sexual function.

Introduction

The female urogenital system is comprised of both the urinary tract (i.e. the kidneys, ureters, bladder and urethra), and the reproductive organs (i.e. the uterus, ovaries, fallopian tube and vagina).

Arising from the urogenital sinus and Müllerian ducts, the urinary bladder, trigone, urethra, vagina and vulval vestibule develop from a common embryological origin (Gandhi *et al.* 2016). Because of this, the genitals, lower urinary tract, levator ani muscles and supporting tissues (including the uterosacral ligaments and fascia) are all oestrogen-receptive (Mannella *et al.* 2013; Nappi *et al.* 2019).

Antimicrobial peptides (i.e. cytokines, chemokines and bacterial products) in the cervicovaginal fluid contribute to immunity and provide defence against pathogens (Chappell *et al.* 2015). This fluid is comprised of genital tract secretions and vaginal epithelium transudate.

Sex hormones have a substantial impact on the female urogenital tract throughout adulthood.

Oestrogen is vasoactive, and supports maturation of the vaginal epithelium and glycogen production. Glycogen breaks down into glucose, and *Lactobacillus* converts this further, producing lactic acid. This helps to maintain an acidic vaginal environment (pH 4.0–4.5) which, along with the cervicovaginal fluid, inhibits inflammation, bacterial pathogens such as bacterial vaginosis, and diseases such as human immunodeficiency virus and herpes simplex (Chappell *et al.* 2015; Linhares *et al.* 2019).

Oestrogen plays an important role in the proliferation of the vaginal epithelium and maintenance of the vaginal rugae, which contribute to compliance, stretch and lubrication during sexual stimulation (Ghandhi *et al.* 2016). This hormone also supports the urethral epithelium and periurethral collagen, and increases urethral resistance. It helps to raise the bladder sensory threshold and promote detrusor relaxation, and has an impact on pelvic and bladder support through its role in collagen synthesis and breakdown. The impact of oestrogen on muscle mass and strength also impacts on urogynaecological function (Calleja-Agius & Brincat 2015).

The clitoris, vulval vestibule, urethra, anterior vaginal wall, periurethral tissue bladder and pelvic floor also respond to androgens (Simon *et al.* 2018; Traish *et al.* 2018). These steroid hormones are associated with the induction of male secondary sexual characteristics, but are

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also produced in the female ovaries and adrenal glands at around one-tenth of male levels. Androgens modulate blood flow, are a precursor for oestrogen production, and have an independent role in maintaining genitourinary structure and function (Traish *et al.* 2018). Free testosterone levels have been correlated with sexual desire and masturbation in healthy young women (Nappi *et al.* 2010), but these gradually decline with age and natural menopause (O'Neill & Eden 2017). However, the link between testosterone and sexual desire has not been definitively established. Androgens also play a role in limbic system disorders such as anxiety, insomnia and mood disorders, and since mental state and well-being are closely linked with sexual function, may have an effect in this way.

Genitourinary syndrome of menopause

The genitourinary syndrome of menopause (GSM) is a collection of lower urogenital tract clinical signs and symptoms associated with decreased oestrogen. Previous terminology such as vulvovaginal atrophy and atrophic vaginitis excluded the urinary symptoms.

Changes occur to the clitoris, labia, introitus, vagina, bladder and urethra that have the potential to make a significant impact on a woman's quality of life (QoL), emotional well-being and activities of daily living (ADLs), including sexual function. This impact has been demonstrated internationally across ethnically diverse groups (Huang *et al.* 2010; Kingsberg *et al.* 2013; Moral *et al.* 2018).

A number of factors have been linked to the development of GSM. Smoking tobacco has been correlated with decreased biosynthesis, increased metabolization of oestrogen and an earlier onset of the menopause (Gu *et al.* 2013; Palacios *et al.* 2015). It is also linked with vaginal atrophy, probably as a result of its effects on local blood flow and tissue oxygenation. Women who have never had a vaginal birth have been observed to be more likely to develop GSM symptoms. In some studies, an increased level of sexual activity has been associated with fewer atrophic changes and GSM symptoms; however, we need to be mindful that this may reflect patients with fewer symptoms engaging in more sexual activity, rather than a causal link.

The onset of GSM occurs between 1 and 6 years after the menopause, and by 7–10 years, 50–65% of women report clinical signs and symptoms; this percentage continues to rise as the time elapsed since the menopause increases (Macbride *et al.* 2010; Nappi & Palacios 2014; Palacios *et al.* 2018). Women often experience multiple symptoms, and this can have a significantly negative impact on their QoL.

Symptoms are not always reported nor treatment sought because women often accept the effects of GSM as a natural part of ageing, are embarrassed to seek help or may not find it bothersome. Nearly half (49%) report finding it hard to speak to medical professionals about their symptoms (Castelo-Branco *et al.* 2015), and only 25% seek treatment (Palacios *et al.* 2015; Panay 2018).

Vaginal symptoms

Oestrogen depletion has an impact on vaginal collagen and elastin, contributing to atrophy, and loss of vaginal size and length. The cervical mucosa, and vaginal and vulval epithelium become thinner and more vulnerable to injury. As the epithelium thins, the rugae decrease, resulting in a smoother vaginal wall. Blood flow decreases because vaginal perfusion both at rest and during sexual arousal is governed by androgens and oestrogen (Traish *et al.* 2018).

Glycogen levels decrease and the vaginal biome is altered. A reduction in *Lactobacillus* results in a more alkaline vaginal pH, and gram-negative flora such as group B *Streptococcus* and *Staphylococcus* overgrow, which contributes to inflammation and infection (Gandhi *et al.* 2016). The altered microbiome lowers the innate immune function and vaginal fluid viscosity alters, often becoming thinner and insufficient, which results in dryness, irritation and increased discomfort. This is the predominant symptom for the majority (75%) of women (Panay 2018).

Urinary symptoms

The most common urinary symptom of GSM is urinary tract infection (UTI) in approximately 20% of women (Panay 2018). Thinning of the urethral and bladder mucosa can contribute to overactive bladder symptoms. The bladder microbiome is also altered, with a reduction in *Lactobacillus* being reported in postmenopausal women (Curtiss *et al.* 2018). There is also a decrease in collagen and elastin in the urethra and bladder. Other urinary symptoms include urge urinary incontinence (UI), frequency and dysuria, and urethral sphincter dysfunction, which can contribute to stress UI (SUI). There is an overlap with the effects of ageing.

Sexual symptoms

The sexual symptoms of GSM affect libido and arousal, sexual satisfaction, and pain or discomfort during sexual activity. For a significant number of women (around 66%), these symptoms have a considerable impact on their enjoyment of sex (Nappi *et al.* 2010), and 40% report dyspareunia (Panay 2018). Fifty-five per cent of women and 61% of men report that painful sex for the woman was the reason that they avoided intimacy (Nappi *et al.* 2013).

The menopause and pelvic floor dysfunction

Rates of pelvic floor dysfunction (PFD) increase with advancing age. The disorders associated with this condition include pelvic organ prolapse (POP), SUI, bladder urgency and frequency, and sexual dysfunction. A number of factors are involved in PFD, and it is difficult to isolate the effects of the menopause and oestrogen deficiency from those related to ageing, childbirth and lifestyle.

Pelvic structures vary in terms of the kind of collagen that is present: types I and III are predominantly found in the ligamentous tissue, and the vaginal wall, pelvic organs and arcus tendineus fasciae pelvis (ATFP), respectively (Moalli *et al.* 2004; Lee *et al.* 2015).

Oestrogen receptors are present in the uterosacral ligaments, levator ani muscles and pubocervical fascia. Animal models using rhesus macaques have shown that oestrogen stimulates collagen synthesis in the connective tissues of the pelvic floor (Clark *et al.* 2005). Therefore, decreased oestrogen levels are theoretically likely to have an impact on the strength and mechanical integrity of pelvic support, but this has not yet been confirmed by research. The ATFP plays a key role in bladder and urethral support. The predominance of type III collagen gives it considerable flexibility. Following the menopause, the type I collagen component decreases even further. This affects tensile strength, and potentially, further contributes to the development of POP and UI, probably as a result of reduced anterior vaginal support and urethral pressure (Moalli *et al.* 2004). The fact that women with connective tissue disorders (e.g. Ehlers–Danlos and Marfan syndromes) have higher rates of POP (Lammers *et al.* 2012) also lends support to the theory that connective tissue changes are likely to play a role in PFD.

In common with other skeletal muscles, those of the pelvic floor lose mass with age. In a sample of 384 women, Pereira *et al.* (2016) demonstrated decreased electromyographic (EMG) activity in the pelvic floor muscles (PFMs) of peri- and particularly postmenopausal participants compared with other groups, with nulliparous women having the highest levels of activity. In some studies, lower EMG activity has been shown to be linked with poorer SUI and overactive bladder (OAB) scores on the International Consultation on Incontinence Questionnaire (Zhang 2006; Burti *et al.* 2015). However, a decrease in EMG activity with ageing has been shown even in continent women, and it is unclear what the separate impact of the menopause might be.

The length of time since the menopause does not appear to predict POP or PFD (Trutnovsky *et al.* 2013). However, Cagnacci *et al.* (2017) reported that increased scores on the Greene Climacteric Scale, which indicate more-severe menopause-related symptoms, were associated with POP.

Abdominal adiposity is common in women after the menopause, and this may well contribute to a greater risk of POP as a result of increased intra-abdominal pressure. This condition is more common in those with both a high body mass index (BMI) and a waist circumference > 88 cm (Handa *et al.* 2004). Another factor may be the increased rates of obstructive defecation reported in middle-aged women (Varma *et al.* 2008). In common with other stages of life, POP may also spontaneously regress after the menopause. Reviewing an 8-year period, Handa *et al.* (2004) found significant levels of resolution for grade 1 POP, and up to 9% for grades 2–3. However, this may represent changes in other factors such as lifestyle, activity levels or occupation at this time of life.

Sexual function and the sexual response

The neural, endocrine and vascular systems all need to be functioning normally in order to enable an appropriate sexual response. This is controlled by central excitatory and inhibitory pathways. Dopamine and melanocortins stimulate attention and desire. Noradrenalin and oxytocin are thought to arouse the sexual response, including vaginal engorgement and lubrication, and the rhythmic muscular contractions that occur during orgasm. Inhibitory signalling includes: serotonin, which controls satiety; opioids, which play a role in sexual rewards; and endocannabinoids, which contribute to sedation (Kingsberg *et al.* 2015).

Sex steroid hormones have both direct and indirect actions through the impact that these have on, respectively: tissue integrity and genital haemodynamics; and the production of other key neurotransmitters in the hypothalamus and limbic system, which prime the brain to respond to sexual cues (Kingsberg *et al.* 2015; Vignozzi & Maseroli 2020).

No one model fully encapsulates the female sexual response (Sand & Fisher 2007). For some, sexual activity is initiated by desire, as in Masters & Johnson's (1966) original model. For example, 50% of women across the menopause transition, and 35% of postmenopausal women report regular masturbation (once a week or more frequently), indicating a sexual desire or urge (Avis *et al.* 2009). For others, desire is more responsive, particularly in longer-term relationships (Basson 2002). Many factors are involved in sexual response, including biological drive, psychological or motivational factors, and cognitive, cultural and situational aspects (Levine 2003).

Both the mind and body can excite and inhibit the sexual response. There may be an individual tipping point of arousal, possibly on a normal distribution curve (Perelman 2009).

Another useful model to consider is that of "Good-Enough Sex" (Metz & McCarthy 2007), which considers sexual activity to be just another ADL. As such, it can be good, bad or indifferent on different occasions. This shifts the focus from performance to intimacy and satisfaction with a relationship.

The frequency of sexual activity decreases with age. Addis *et al.* (2006) reported that 75% of 40–69-year-olds were sexually active, with two-thirds being satisfied with their sex life. In their slightly older sample (55–74 years), Erens *et al.* (2019) found that females were slightly less active (54%) compared to males (62%), but rates of satisfaction for both were approximately 42%.

Sex and the menopause

Sex remains important throughout the human lifespan and has a considerable impact on QoL (Eden & Wiley 2009; Thornton *et al.* 2015). In a study of 405 postmenopausal women, a low Female Sexual Function Index (FSFI) score was correlated with poor overall QoL scores, and 61% of the participants suffered from sexual dysfunction (Nazarpour *et al.* 2016).

It has been theorized that continued sexual activity may delay the menopause. The US Study of Women's Health Across the Nation found that weekly or monthly sexual activity appeared to lower the risk of entering the menopause by 28% in a sample of 2936 participants (Arnot & Mace 2020). The authors postulated that this delay was related to pheromone exposure from cohabitation with males, but found little evidence for this. They included any form of sexual activity including oral stimulation, rationalizing that the physical cues of sex would indicate that there might still be possibility of becoming pregnant. However, the study overlooked other factors; for example, a woman who is already experiencing the onset of GSM symptoms may choose not to engage in sexual activity.

A wide range of factors have an impact on sexual arousal or a woman's ability to engage with sexual activity after the menopause. In the third British National Survey of Sexual Attitudes and Lifestyles, Erens *et al.* (2019) reviewed 3343 people aged 55–74 years in a mixed-methods study. They found that one in four men and one in six women had a health condition or medication that had a detrimental impact on sex.

Lindau *et al.* (2007) found lack of desire to be the most prevalent sexual problem associated with the menopause: it was experienced by 43% of their participants, and there was considerable overlap with arousal, orgasm and pleasure. Although vaginal pain was the least common issue (17%), it had the greatest impact on QoL (97% rated it as bothersome). It is unclear how much of the decline in sexual function relates to the effects of the menopause as opposed to biological aging. Some studies show no change to sexual function in younger menopausal women, but more-severe menopausal symptoms do correlate with reported sexual dysfunction, and there is a strong association between menopause-related genital symptoms and sexual pain (da Silva Lara *et al.* 2009). In one study, 40% of sexually active postmenopausal women admitted experiencing dyspareunia, and this was correlated with advanced menopausal age (Versi *et al.* 2001). Loss of libido is greatest in women who have undergone surgical menopause, possibly as a result of the abrupt drop in levels of circulating sex hormones, but it is probably also linked to age and the reasons for performing the surgical procedure (Arnot & Mace 2020).

Figure 1 outlines the different factors that impact on sexual function. There is considerable overlap and interaction between these elements.

Harder *et al.* (2019) found that just over half of a large sample of women aged between 50 and 74 years were sexually inactive. This was either

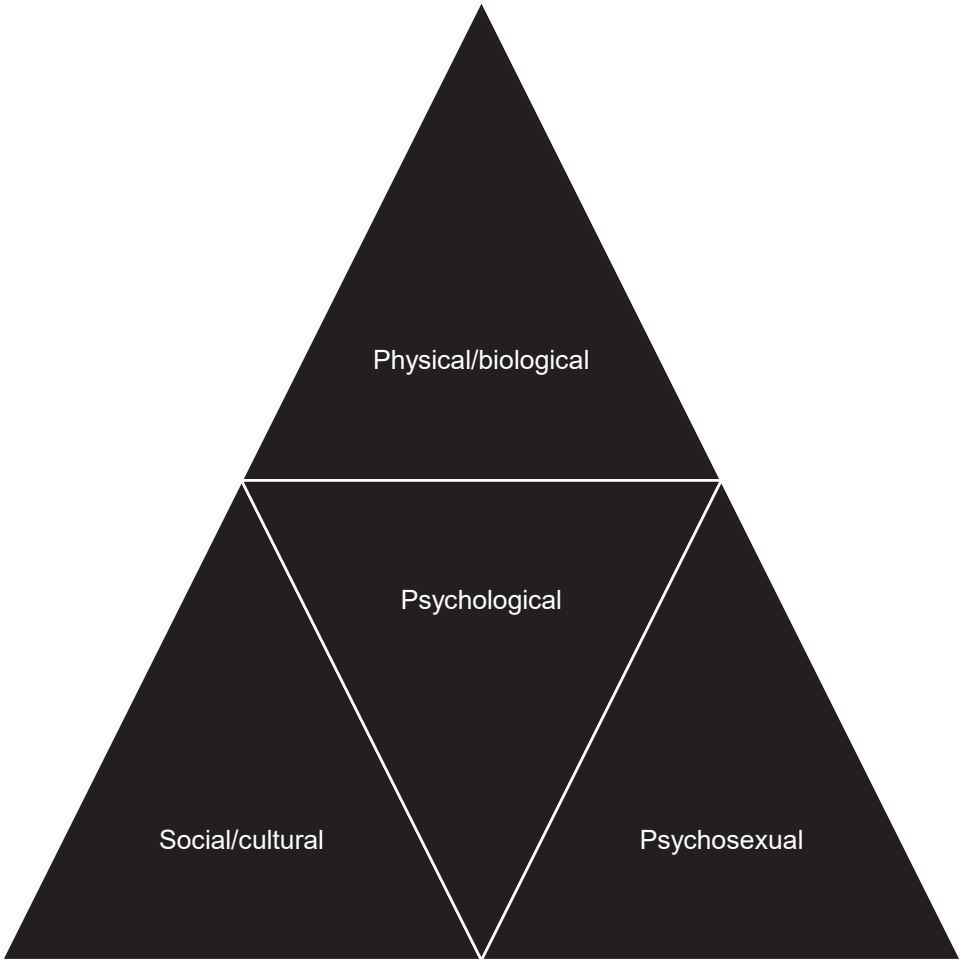

Figure 1. Interrelated factors that have an impact on sexual function.

because of a lack of an intimate partner, or a result of physical or psychological factors (relating to both themselves and their partner), including physical ill health, lack of libido and tiredness. Menopause-related body changes may play a part here (e.g. flushes, tissue friability, or other issues such as POP or incontinence). Medication use may also be a factor; for example, selective serotonin reuptake inhibitors have been associated with reduced desire and anorgasmia. For women with sexual partners, the main reasons for inactivity related to the partner's physical health or sexual function (usually erectile dysfunction or lack of libido), issues that also had an impact on the quality and quantity of sex for those participants who were sexually active (Harder *et al.* 2019).

Social factors such as the quality and length of a relationship, and loyalty have been shown to be important (Nazarpour *et al.* 2016). If a partner is unwilling or unable to adapt to the woman's menopause-related symptoms, this has a significant negative impact (Huang *et al.* 2009). Satisfaction levels are higher in women who find it easier to communicate with a partner about sex (Erens *et al.* 2019). In fact, relationship factors have an impact on a woman's QoL that exceeds the effect of menopause status and symptoms (Dennerstein *et al.* 2003). Psychosexual contributors can include upbringing, religion, someone's own sexual self-concept, and the context given by subjective arousal, interpretation and prior experiences (Dennerstein *et al.* 2003; Eden & Wylie 2009; Nappi *et al.* 2010; Nazarpour *et al.* 2016; Harder *et al.* 2019).

Social and cultural expectations about sex also have an impact at this time of life (Tetley *et al.* 2018). Additionally, women are often dealing with many social and psychological stressors, including caring for children or elderly relatives, career pressures, and other significant life events such as bereavement or divorce. All of these factors can have an impact on female arousal, or indeed, making time for sex.

It is worth noting that the research base still has a predominantly heteronormative bias, with a focus on penetrative sex as denoting sexual activity (Winterich 2003; Hinchliff *et al.* 2010). Additionally, many studies (e.g. Harder *et al.* 2019) do not consider characteristics such as masturbation

and intimate touch, which may become a more important part of satisfactory sex as people age. A biomedical research focus on the menopause can also omit the experiences of women who undergo a positive change or find no difference in their sexual well-being, or where changes do not have a negative impact on their sexual relationship (Hinchliff *et al.* 2010; Harder *et al.* 2019).

Clinical evaluation

Common findings on clinical evaluation include: anatomical changes to the labia (e.g. smaller, flatter or fused); a loss of rugae; a smaller, retracted cervix and prominent urethral meatus; and narrowing and decreased elasticity of the introitus. The skin may be pale, shiny or red, and the epithelium more delicate, often with fissures and petechiae (red spots). Secretions will often be insufficient (Kim *et al.* 2015; Moral *et al.* 2018).

Although these symptoms may be a result of oestrogen deficiency, it is also important to remember that inflammatory conditions (e.g. dermatitis, lichen sclerosis and lichen planus) and neoplastic changes (e.g. vulvar intraepithelial neoplasia and squamous cell carcinomas) are more common in postmenopausal women (Gandhi *et al.* 2016). Further aspects to consider include tissue damage, POP, an overactive pelvic floor, and infections such as bacterial vaginosis or thrush.

Outcome measures

Currently, a wide variety of outcome measures are used to evaluate GSM (Christmas *et al.* 2020), which makes comparisons across studies and interventions more difficult. Some consider aspects of GSM, such as the Vaginal Health Index Score (Bachmann 1995), the Day-to-Day Impact of Vaginal Aging questionnaire (Huang *et al.* 2015) or the Female Sexual Function Index (Rosen *et al.* 2000). Others are more general; for example, the Vulvovaginal Symptoms Questionnaire (Erekson *et al.* 2013). A core outcome tool for menopausal symptoms that covers both GSM and vasomotor symptoms is currently in development (Kim *et al.* 2020).

Treatment options

Hormonal treatment

Many women find that topical oestrogen is extremely helpful. The low dose results in serum oestradiol levels that are still well within the normal postmenopausal range, and it is 80–90% effective in the treatment of the sexual symptoms of GSM (Naumova & Castelo-Branco 2018). Topical oestrogen reduces complaints of UI, OAB and UTIs (Caretto *et al.* 2017; Matarazzo *et al.* 2018), and may possibly play a role in the prevention of POP (Mannella *et al.* 2013; Weber *et al.* 2015), although further research is needed to confirm this.

After conducting a high-quality systematic review, Rahn *et al.* (2015) concluded that vaginal oestrogen has an important role in the management of postmenopausal PFD. They found that topical oestrogen improved the vaginal maturation index and increased vaginal epithelium, and there was some evidence that it may reduce the need for POP surgery in women > 60 years of age. Additionally, levels of urinary urgency, frequency and incontinence were reduced, and became similar to those recorded when individuals were prescribed oxybutynin. However, overall, the studies involved small numbers of participants and rated as being of poor to moderate quality, and long-term improvement was not measured. Side effects such as breast tenderness, vaginal bleeding and discharge are common, and creams are often less well tolerated than pessaries (Ostle 2015). Women undergoing systemic hormone replacement therapy (HRT) for vasomotor symptoms report some improvement in GSM symptoms, and improved lubrication and sexual function. However, if GSM is the only issue being experienced, then topical oestrogen treatment is recommended rather than HRT (Kagan *et al.* 2019).

Levels of vaginal dehydroepiandrosterone (DHEA), an indirect precursor for sex steroid hormones that is produced in the adrenal cortex, decline with advancing age (Pięta & Smolarczyk 2020). The application of topical intravaginal DHEA has been shown to significantly improve the condition of the epithelium, skin colour and secretions, and also maintain serum steroid levels at normal postmenopausal levels (Labrie *et al.* 2018). Intravaginal testosterone elevates serum testosterone levels, and improves vaginal pH and reduces dyspareunia (Simon *et al.* 2018). Androgen administration has a positive effect on female desire and arousal (Davison & Davis 2011). A global consensus statement on the use of testosterone in the treatment of menopausal symptoms (Davis *et al.* 2019) found high-quality evidence of a beneficial effect attributable to systemic testosterone on sexual function in all domains, resulting in decreased sexual concerns and distress. A lack of specific products licensed for women and the need to develop these was highlighted.

Non-hormonal treatment

Selective oestrogen receptor modulators such as ospemifene have also been shown to improve FSFI scores in postmenopausal women (Constantine *et al.* 2015), and be beneficial in the treatment of moderate to severe GSM symptoms (Palacios *et al.* 2015).

Non-hormonal topical applications are extremely useful, and can be used in conjunction with topical HRT. The use of lubricants during sexual activity and long-lasting vaginal moisturizers both reduce friction. Moisturizers contain molecules (e.g. hyaluronic acid or polycarbophil gel) that retain water and release it slowly. With regular use, these can rehydrate the epithelium and lubricate the vaginal walls for up to 3 days, and also improve vaginal pH (Edwards & Panay 2015; Palacios *et al.* 2020). There is evidence that moisturizers reduce the symptoms of GSM (Nappi *et al.* 2017; Palacios *et al.* 2017), and therefore, these offer a viable option when non-hormonal treatment is required or preferred.

The osmolality of products should be checked since the vaginal epithelium can be dehydrated if this is too high, resulting in irritation and tissue damage (Edwards & Panay 2016; Kagan *et al.* 2019). The World Health Organization advises an osmolality of 380 mOsm/kg to minimize these risks (an upper limit of 1200 mOsm/kg is acceptable) and a pH of 4.5 (Kagan *et al.* 2019).

Laser vaginal rejuvenation using CO_2 wavelengths ablates mucosal tissue in order to stimulate collagen formation and remodelling. This treatment is generally expensive, but a study by Wallace *et al.* (2020) found that it is a cost-effective option for postmenopausal dyspareunia. Although there is some evidence that laser vaginal rejuvenation has a positive effect on GSM symptoms, the research base is compromised by small sample sizes, a lack of randomization or placebo, and short-term follow-up (Mounir *et al.* 2021). The risks of this form of treatment include thermal injury, scarring and persistent pain (Bhide *et al.* 2019). It is unclear whether the changes reported represent regeneration or mainly recovery from thermal injury, and the intervention is currently not recommended for routine clinical practice (Preti *et al.* 2019).

Physiotherapy

Lifestyle advice

Lifestyle advice should address factors that could accelerate oestrogen deprivation, or have an impact on the vaginal microbiome and local tissues. Where appropriate, this might include brief guidance and referral on for smoking cessation, dietary modification, and the use of pre- and probiotics. Exercise advice and support is also key. An increased BMI and low physical activity rates have been shown to increase the risk of vaginal symptoms, possibly because of a link with decreased genitourinary vascular supply (Kingsberg *et al.* 2013). Skin and vulval care advice should include recommendations about the removal of irritants (e.g. soaps, bubble baths, excess washing and man-made fibres), and education about the itch-scratch cycle. Suggestions about non-hormonal topical applications should be made. The usual lifestyle advice regarding the bladder and POP should also be offered, along with support, where required, to help women understand their anatomy, sexual response and pain mechanisms.

Pelvic floor muscle training

Pelvic floor muscle training is a mainstay of physiotherapy treatment that helps to improve perineal awareness and pelvic floor function. As at other stages, it is highly beneficial for reducing UI (Nygaard *et al.* 2013). In a small feasibility study, Mercier *et al.* (2019) reported promising indications that PFMT could play a role in improving GSM symptoms. Although the 12 weekly, 1-h sessions and home exercise were quite onerous for the 32 women who took part, levels of compliance with both the clinic sessions and home exercises were extremely high. Improvements were demonstrated in vaginal colour and secretions, and discomfort was reduced in the women's daily lives and during sex.

Capobianco *et al.* (2012) reported that combining topical oestrogen with PFMT (with or without electrical stimulation) was more effective than either alone. This resulted in a decrease in the symptoms of urogenital atrophy, an improvement in maximum and mean urethral pressures, and a reduction in UTIs and incontinence.

Antônio *et al.* (2018) demonstrated that PFMT increased pelvic floor strength significantly more in women who were not using systemic HRT. They also found that it had a significantly greater impact on urinary symptoms, but since baseline levels of UI were already greater in the HRT group, this did not prove to be significant.

Nazarpour *et al.* (2018) compared 12 weeks of specific PFMT instruction and weekly follow-up to general menopause advice in 97 Iranian women. The FSFI scores for arousal, orgasm and satisfaction were significantly higher in the intervention group. In an attempt to control for

the effects of age, these women were in the early postmenopausal period (i.e. ≤3 years), and therefore, it is unclear if similar results would occur in those who were at a later stage. In a review of 585 US and UK women with PFD, Kanter *et al.* (2015) found that women with stronger (i.e. normal rather than hypoactive) PFM strength had higher sexual function scores. However, the cross-sectional study design precluded conclusions being drawn about causation.

Pelvic floor muscle training is likely to improve vulvovaginal blood flow, tissue quality and mobilization of the soft tissues, and will also increase awareness of the pelvic floor. It is a simple, low-cost treatment, but more research still needs to be done in order to establish its effectiveness in relation to the menopause.

Treatment also needs to be targeted at maintaining the length and flexibility of the vagina, and consideration given to what happens when the urogenital system is challenged during sexual activity (Traish *et al.* 2018). It should be individualized, but may include regular vaginal work (ideally at home as well as working with the physiotherapist) using fingers, vibrators, sex toys, vaginal trainers/dilators, vaginal manual therapy or partner work, including penetration where appropriate or desired. It is really important that this work is supported with education through good explanations and demonstrations.

Talking to patients about sex

Kingsberg *et al.* (2019) stated that women often feel reticent about discussing their vaginal and sexual difficulties, and HCPs may feel that they have insufficient skills to address these issues. Studies show that >90% are willing to discuss sexual function with their doctors (Meystre-Agustoni *et al.* 2011; Zéler & Troadec 2020), but they are frequently reluctant to raise the issue themselves, believing that the HCP should do this. Therefore, we need to be proactive in asking women about symptoms. We need to make it clear that we are open to discussing sexual function, and be mindful of the individual woman's perspectives and any biases we bring to the conversation ourselves (Winterich 2003; Hinchliff *et al.* 2010).

Considering the PLISSIT (Permission, Limited Information, Specific Suggestions and Intensive Therapy) model (Annon 1976), permission can be given either verbally or by displaying posters that indicate a willingness to discuss sexual activity. Limited information provision might include leaflets or other educational materials. Specific suggestions include cognitive or behavioural strategies, and intensive therapy involves more-specialist intervention (e.g. counselling or psychosexual therapy). Short training courses provide an understanding of an approach, and specific skills to use in order to deliver the first three aspects of the PLISSIT model.

However, a qualification and ongoing supervision is necessary for the provision of intensive therapy. This is likely to be via university Master's degree modules, or under the aegis of a validated psychological or medical body, such as the Institute of Psychosexual Medicine (IPM) diploma, which the present author has completed. This approach to treatment evaluates the patient–physiotherapist relationship and the patient's response to the intimate examination. It considers what the above reveal about the patient's unconscious or repressed emotions, and how these may contribute to the sexual difficulty. Training takes place in multidisciplinary team seminar groups, and these or other, similar training groups add a great deal to support and supervision when working with peri- and postmenopausal women who have sexual issues.

Conclusion

The menopause has a significant impact on urogenital health and sexual function. However, it needs to be viewed through biopsychosocial/sexual and cultural lenses, and with the understanding that the effects of biological ageing also contribute to these issues.

Other resources

For further information, refer to the third edition of the *Introduction to Psychosexual Medicine* (Brough & Denman 2019). The website of the IPM (www.ipm.org.uk) provides a useful introduction to this topic, and has details about training courses and the diploma in psychosexual medicine.

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