Recognising Female Sexual Dysfunction as an Essential Aspect of Effective Diabetes Care

Corresponding authors:

Anne Phillips

Senior Lecturer in Diabetes Care,

Seebohm Rowntree Building - Area 5,

Dept of Health Sciences,

Faculty of Science,

University of York,

Heslington,

York, YO10 5DD, UK.

anne.phillips@york.ac.uk

Tel: +44 1904-321674 / +44 7961946486

Weblink : http://www.york.ac.uk/healthsciences/our-staff/anne-phillips/

Conflicts of interest: none

Stephen Phillips

Senior Lecturer in Adult Nursing,

Ramsden Building,

University of Huddersfield,

Queensgate,

Huddersfield, HD1 3DH, UK.

s.phillips@hud.ac.uk

Conflicts of interest : none

Abstract

The following literature review will focus on sexual dysfunction in women living with diabetes, drawing on international studies in this specialist field. The key aim of this paper is generate a greater understanding and recognition of the issues facing these women and to determine a more proactive approach to identification, consultation and potential treatment options. The main findings highlight the unique role practitioners have with women with diabetes and how to facilitate partnership working. Nurses have the most frequent contact with people living with diabetes in any healthcare system. Nurses' knowledge about sexuality in relation to diabetes should improve patient education, recognition and could signal undiagnosed or increased risk of sexual dysfunction to enable treatment so care can be optimised accordingly (Sivrikaya et al, 2014).

Key words

Female sexual dysfunction

Diabetes

Sexuality

Effective consultation

Psychological considerations

Key phrases

Sex is an important part of all adult relationships

Female Sexual Dysfunction has become more recognised as an aspect of living with diabetes

Exploring sexuality and sexual wellbeing with women is part of the holistic nature of care

Sexual difficulties in females appear currently more readily recognised in society

Diabetes is one of the most common long term diseases in nearly all countries

Female Sexual Dysfunction is generally a self-reported condition, thereby continues to be unrecognised

Introduction

Sex is an important part of all adult relationships and increasingly Female Sexual Dysfunction (FSD) has become more recognised as an aspect of many women's experiences, especially those living with diabetes. However, the historical paucity of research into FSD, as compared to male, is only becoming addressed more frequently in more recent years. A key reason being related to an emphasis on traditional research approaches regarding recognition of male sexual dysfunction linking to reproduction purposes whereas female sexual functioning not having this requirement (Maiorion et al, 2014). Female sexuality has begun to be considered as an important aspect of women's health with the World Health Organisation (WHO, 2014) declaring this as a basic human right. Exploring sexuality and sexual wellbeing with women is part of the holistic nature of care and therefore the complexities of sexual identity and sexual dysfunction relating to living with diabetes need recognition within practice (Phillips & Khan, 2010).

Female Sexual Dysfunction

FSD has several causes including interpersonal, contextual (social), psychological and biological (Berman, 2005). Consequently, every factor contributing to normal sexual functioning can be a potential cause of dysfunction. The first phase of female sexual response is governed by a combination of neuromuscular and vasocongestive events including increased clitoral size (diameter and length), vaginal lubrication and wall engorgement (Otunctemur et al, 2014). Orgasm is the culmination of sexual arousal, although Lloyd (2005) reported approximately 90% of women report orgasm from some form of sexual stimulation, most women do not and some never experience orgasm solely from sexual intercourse, whereas 100% of men routinely experience orgasm solely from sexual intercourse.

Maiorino et al (2014) reported that normal sexual response requires the integrity of the sensory and automatic nervous systems responding to erotic stimuli. The smooth muscle relaxation of the female genital erectile tissue and increase in blood supply are dependent on the healthy action of non-adrenergic / non-cholinergic neurotransmitters. The regulation of blood supply and clitoral erectile function is governed by the same vasoactive intestinal polypeptides such as Nitric Oxide and cGMP that govern erectile functioning in males. Bargiota et al, (2011) also reported that normal levels of various hormones are required for physiologic sexual activity. Diabetes can potentially disrupt all of these integrated systems triggering females to experience sexual dysfunction. The systems involved include hyperglycaemia, vascular and neuropathic damage, infections and hormonal disorders.

In males, orgasms are under 'strong selective pressure' as orgasms are coupled with ejaculation thus contributing to reproductive success (Wallen & Lloyd, 2010). By contrast, female orgasms in intercourse are under little selective pressure as they do not constitute a reproductive necessity. Normal sexual

function in females occurs by an interaction between emotional and physical wellbeing, this complex interaction maybe modified by disease, anatomic, physiological and/or emotional causes (Vaccaro et al, 2014).

Sexual difficulties in females appear currently more readily recognised in society (Maiorino et al, 2014) with large epidemiological US studies reporting the prevalence of FSD to be 40-60% (Shifren et al, 2008, Dennerstein et al, 2002, Lindau et al, 2007) with highest values reported in postmenopausal females.

Diabetes

Diabetes is one of the most common long term diseases in nearly all countries and is increasing to epidemic proportions; the International Diabetes Federation (IDF, 2015) reported a world prevalence of 387 million people diagnosed and living with diabetes which is 8.3% of the world population. Also predicted is 46.3% of the world population being undiagnosed currently. The prevalence of diabetes is anticipated to reach 592 million by 2025 (IDF, 2015). A higher prevalence of FSD has been associated with diabetes (Maiorino et al, 2014).

Research into the arterial blood supply supplying the female pelvic anatomy relating to the presence of atherosclerosis of the arterial bed can lead to decreased vaginal engorgement and clitoral insufficiency syndrome resulting in vasculogenic FSD (Doumas et al, 2005, Gragasin et al, 2004). Additionally the prevalence of Metabolic Syndrome increases during the fifth and sixth decades of women's lives and also coincides with the onset of the menopause hence associated with the lower oestrogenic milieu which enhances risk factors for metabolic syndrome such as increased insulin resistance, obesity and hyperglycaemia (Otunctemur et al, 2014). Hyperglycaemia is the main determinant of preventable vascular and neuropathic complications of diabetes and control of risk factors in a person centred partnership is the focus of effective diabetes care (Phillips, 2012).

FSD is associated with both type 1 insulin dependent diabetes (Enzlin et al, 2009) and type 2 diabetes (Giugliano et al, 2010). A meta-analysis by Pontiroli et al, (2013) which included 26 studies and 3,168 women with diabetes compared to 2,832 controls reported that the risk for sexual dysfunction was 2.27 (95% confidence interval (CI) with 2.49 (CI 1.55 – 3.99) in type 1 and type 2 diabetes respectively. Interestingly, Pontiroli et al, (2013) reported increased risk of FSD in premenopausal rather than postmenopausal females.

The presence of prolonged hyperglycaemia reduces the hydration of the vaginal mucus membranes, producing reduced lubrication and females experiencing dyspareunia (Ismail et al, 2014, Erten et al, 2013). Hyperglycaemia also increases the risk and incidence of genitourinary and fungal infections which can

cause vaginal discomfort and dyspareunia (Phillips, 2012). Vascular and neuropathic complications of diabetes can cause decreased nerve stimulation and blood flow, which inhibits sexual response to stimuli, thereby impairs reaction of the vaginal tissue to reduced nerve stimulation (Maiorino et al, 2014). Vascular abnormalities including atherosclerotic damage and diabetes-induced endothelial dysfunction are postulated to also interfere with clitoral engorgement and vaginal lubrication which lead to decreased arousal and dyspareunia during intercourse. Additionally the presence of neuropathy can further participate by altering the normal transduction of sexual stimuli and triggered sexual response (Duby et al, 2004).

Several endocrine pathways are associated with diabetes; Bhasin et al, (2007) and Feldhaus-Dahir, (2009) undertook epidemiological studies which indicated that the alterations of androgens and oestrogens implicated in disorders such as polycystic ovarian syndrome which is associated with obesity, insulin resistance, lipid disorders and ovulatory infertility also affects FSD (Eftekhar et al, 2014). Hormonal imbalances accompanying diabetes such as thyroid and/or hypothalamic –pituitary disorders can further contribute (Bhasin et al, 2007).

Psychological considerations

FSD is generally a self-reported condition, thereby continues to be unrecognised and under reported (Thakar, 2009). FSD has an important impact on females' quality of life. Filocamo et al, (2013) reported from their cross-sectional multi-centre study in gynaecological and urological clinics across Italy that under-reporting of FSD reflected practitioners reluctance to ask females about their sexual life during consultations. Their study used the Female Sexual Function Index (FSFI) which is recognised as the gold standard for screening for FSD.

Vafaeimanesh et al, (2014) in their descriptive analytical study recognised a strong association of women experiencing FSD with psychological health issues such as anxiety, depression, low self-esteem, body image perception disorders, sexual performance anxiety, fear of rejection, past traumatic sexual experience and history of abuse (Bancroft et al, 2003, Cyranowski et al, 2004). Furthermore, Ismail et al, (2014) recognised that being diagnosed with diabetes or during a period of ill health might cause females to experience a loss of libido. Furthermore, obesity and being overweight are associated (independently of age) with FSD (Costa and Brody, 2014).

Several factors have been associated with reduced or absent subjective sexual arousal and research has substantiated the association between sexual and mental health of women such as diminished desire and arousal (Kalmbach et al, 2014). Depression is twice as likely to be experienced by people living with

diabetes and one in three people with diabetes experience a significant loss in their quality of life due to depression, with the risk for females being higher than for males (Phillips, 2012). Several research studies have reported increased incidence of depression with lower educational levels (Kucuk et al, 2013, Lloyd et al, 2012, Yang et al, 2009, Stankunas et al, 2006, Sivrikaya et al, 2014). Practitioners also need to acknowledge the effects on sexual dysfunction of anti-depressant treatments.

Associated to this, acknowledgement of the practical difficulties of living with diabetes can cause anxiety and distress which can further inhibit or trigger FSD. Distress related to body image perception from worrying about the seemingly unsightly appearance of induced lipohypertrophy at injection sites can be inhibiting when engaged in sexual activity with new partners (Phillips & Khan, 2010). Additionally, for women who use insulin, fear of an unexpected hypoglycaemic episode during or after sex, or not recognising if a hypo is occurring can cause anxiety.

Enzlin et al, (2009) as part of the EDIC Study Group reported females with diabetes had a more negative appraisal of their condition and more problems with their emotional adjustment to the disease. They also reported less satisfaction with their diabetes treatment. Enzlin et al (2009) also studied females who experienced diabetes related complications to those who were complication free at the time of their study. The difference between the two groups was significant as the females who were living with diabetes related complications including FSD blamed this 'as another complication of the disease'. Sarkadi and Rosenqvist (2003) identified in their cohort study of females with diabetes, the expression of guilt and embarrassment related to their diabetes, and Phillips (2014) identified diabetes related grief and distress as having a significant influence on women's appraisal and perception of their diabetes.

Additionally, problems relating to FSD are multi-factorial as recognised by Berman (2005). These can be connected to emotional and social difficulties in the woman's life including work related, family or relationship distress. The quality of the relationship is recognised as a major factor, from research into women's experiences of sexual dysfunction (Sivrikaya et al, 2014).

What practitioners need to ask?

Sexual health is very personal and women can feel embarrassed when asked about it. They might feel it more appropriate to see a female practitioner and they may or may not want to have their partner with them. Additionally, practitioners need to demonstrate cultural and / or religious sensitivities when discussing sexual health and wellbeing (Nelson, 2009). It is important for practitioners to be more aware of some of the causes and links between diabetes and FSD so women can be understood and helped

effectively. When reviewing women with sexual dysfunction a physical examination should be undertaken including the factors in table 1.

Treatment options

Women can be referred with their partners to a sexual relationship therapist with experience of working with couples to overcome sexual problems. The therapy aims to ease tensions and uses techniques such as Cognitive Behavioural Therapy and Sensate Focussing which helps couples to learn to touch each other in a sensual rather than sexual way in order to try to reduce possible tension and increase performance (Avagianou, 2015). These types of psychological approaches can be very helpful, however culturally sensitive approaches and awareness of religious preferences need acknowledgement when suggesting this type of therapy (Phillips & Khan, 2010).

Psychological and physical problems have the potential to contribute to arousal disorders resulting in vaginal dryness. Advice regarding the use of over the counter water based lubricants can be the first step many women will benefit from.

As highlighted, some FSD results from diminished blood flow to the clitoris, labia and vagina and stimulation with a mechanical vibrator may not achieve adequate engorgement because of poor blood flow. Treatment options do include a clitoral engorgement device which applies a gentle vacuum to engorge the clitoris even in the presence of diminished genital blood flow, this could have important treatment efficacy for women with diabetes (Billups, 2002).

Some research is emerging regarding the efficaciousness of antioxidant therapies and the use of Phosphodiesterase type 5 inhibitors (Monte et al, 2014) however until more evidence is available, this remains experimental only.

Conclusion

Practitioners have a unique relationship with women with diabetes receiving care. Through acknowledging and recognising the increased risk of FSD and through effective consultation through partnership working in a person centred way this can be recognised and approached with sensitivity to help women who may feel embarrassed to broach this subject with practitioners believing it is their fault due to their diabetes. Reassuring consultation skills and having awareness of the evidence can enable effective consultations and treatment escalation as required to help women with their sexual health and sexuality.

Table 1

Investigative guide to help asking women about sexual dysfunction in diabetes

Diabetes Specific Questions	Rationale
What medications are you currently taking?	To establish whether there are any possible iatrogenic-related influences that can be addressed.
Are you experiencing any stress or depressive symptoms?	To review if depression is present & to enable discussion if this is the case. Review of treatment if depression is already diagnosed.
Have you recently had a baby?	To find out whether the woman has experienced a difficult delivery or birth injuries, & whether she is getting enough sleep & has sufficient support to help her.
Do you feel tired all the time?	To establish whether this is due to hyper or hypoglycaemic unawareness, which can both cause fatigue. If the woman's sleep pattern is disturbed, she may be experiencing anxiety, stress or depression.
Do you experience vaginal dryness?	To find out whether this is related to diabetes control, neuropathy, medication, hormones or the menopause & whether the woman would like to have treatment for this.
Do you feel uncomfortable or experience pain during sex?	To explore whether this maybe causing sexual anxiety.
Do you experience recurrent infections, especially thrush or urine infections?	To investigate whether this is due to sub-optimal control of the woman's diabetes. Fungal infections are easily treatable & advice regarding blood glucose control can be given.
General Questions?	Rationale
Do you feel there is a problem with your relationship with your partner?	To explore whether the woman is experiencing martial tensions or guilt about relationships, each of which can inhibit sexual experience.
Do you feel embarrassed by having sex?	To discover whether or not a past negative experience or previous abuse may be influencing the present situation.
Do you feel you have a poor self-image?	To give the woman an opportunity to discuss any feelings of depression or low self-esteem, for example due to obesity, which can have a negative impact on sexual function.
Have you ever experienced sexual or physical abuse?	To discover whether the woman has a past negative experience (see above).
Adapted from Phillips & Khan, 2010.	

References

Avagionou P (2015) Erectile dysfunction in hypertension & cardiovascular disease in A Guide for Clinicians, Springer Pub: Switzerland.

Bancroft J et al (2005) Distress about sex: a national survey of women in heterosexual relationships, Arch Sex Behav, 32, 193-208.

Bargiota A et al (2011) Sexual dysfunction in diabetic women, Hormones (Athens), 10, 3, 196-206.

Berman J (2005) Physiology of female sexual function & dysfunction, Int J Impot Res, 17, S44-51.

Bhasin S (2007) Sexual dysfunction in men & women with endocrine disorders, Lancet, 369, 9561, 597-611.

Billups K (2002) The role of mechanical devices in treating female sexual dysfunction & enhancing the female sexual response, World J Urol, 20, 137-41.

Costa R & Brody S (2014) Orgasm & women's waist circumference, European Journal of Obstetrics & Gynaecology & Reproductive Biology, 182, 118-122.

Cryanowski J et al (2004) Lifetime depression history & sexual function on women in midlife, Arch Sex Behav, 33, 539-48.

Dennerstein L et al (2002) Hormones, mood, sexuality & the menopause transition, Fertil Steril, 77, Suppl 4, S42-S48.

Doumas M et al (2006) Female sexual dysfunction in essential hypertension: a common problem being uncovered, J Hypertens, 24, 12, 2387-2392.

Duby J et al (2004) Diabetic neuropathy: an intensive review, Am J Health Syst Pharm, 61, 2, 160-173.

Eftehar T et al (2014) Sexual dysfunction in patients with polycystic ovary syndrome & its affected domains, Iran J Reprod Med, 12, 8, 539-546.

Enzlin P et al (2009) DCCT/EDIC Research Group. Sexual dysfunction in women with type 1 diabetes: long-term findings from the DCCT/EDIC study cohort, Diabetes Care, 32, 5, 780-886.

Erten Z et al (2013) Sexual lives of women with diabetes mellitus (type 2) & impact of culture on solution for problems related to sexual life, Journal of Clinical Nursing, 23, 995-1004, DOI: 10.1111/jocn.12273.

Feldhaus-Dahir M (2009) The causes and prevalence of hypoactive sexual desire disorder: part 1, Urol Nurse, 29, 4, 259-263.

Filocamo et al, (2013) The female sexual function index (FSFI): Linguistic validation of the Italian version, International Society of Sexual Medicine, J Sex Med, 11, 447-453.

Giugliano F et al (2010) Determinants of erectile dysfunction in type 2 diabetes, Int J Impot Res, 22, 3, 204-209.

Gragasin F et al (2004) The neurovascular mechanism of clitoral erection: Nitric oxide & cGMP-stimulated activation of BKCa channels, EASEB Journal, 18, 1382-91.

Kalmbach D et al, (2014) The transaction between depression and anxiety, symptoms & sexual functioning: A prospective study of premenopausal healthy women, Arch Sex Behav, DOI 10.1007/s 10508-014-0381-4.

International Diabetes Federation (2015) Diabetes Facts & Figures, http://www.idf.org/worlddiabetesday/toolkit/gp/facts-figures (accessed 010215).

Ismail A et al (2014) Factor analysis study on sexual responses in women with type 2 diabetes mellitus, Comprehensive Psychiatry, 55, S34-S37.

Kucuk L et al (2013) The relationship between depression & sexuality in patients with depression in patients with Type 2 Diabetes in Turkey, Sex Disabil, 31, 1, 43-52.

Lloyd C et al (2012) Epidemiology of depression in diabetes: International & cross-cultural issues, J. Affect Disord, 142 Supp, 22-29.

Lindau S (2007) A study of sexuality & health in older adults in the United States, N Engl J Med, 357, 8, 762-774.

Maiorino M et al (2014) Diabetes & sexual dysfunction: current perspectives, Diabetes, Metabolic Syndrome & Obesity: Targets & Therapy, 7, 95-105.

Monto G et al (2014) Women taking the 'blue pill' (sildenafil citrate): such a big deal? Drug Design, Development & Therapy, 8, 2251-2254.

Nelson S (2009) Women & sex in Squire C Ed. The Social Context of Birth, 2nd Ed, Radcliffe Publishing: Oxford.

Otunctemur A et al (2014) Effect of metabolic syndrome on sexual function in pre & post-menopausal women, Journal of Sex & Marital Therapy, 0, 0, 1-10.

Pontiroli A et al (2013) Female sexual dysfunction & diabetes: a systematic review & meta-analysis, J Sex Med, 10, 4, 1044-51.

Phillips A & Khan K (2010) Assessment & support of women with sexual dysfunction, Practice Nursing, 21, 9, 474-477.

Phillips A Ed (2012) Principles of Diabetes: evidence based management for health care professionals, Quay Books: UK.

Phillips A (2014) Diabetes Related Grief and Distress – Recognising This Within Practice, Practice Nursing 25, 12, 347-350.

Sarkadi A & Rosenqvist U (2003) Intimacy & women with Type 2 Diabetes: an exploratory study using focus group Interviews, Diabetes Educ., 29, 4, 641-652.

Shirfren J et al (2008) Sexual problems & distress in the United States women: prevalence & correlates, Obstet Gynecol, 112: 970-8.

Sivrikaya S et al (2014) Sexual dysfunction & depression in Turkish women with Type 2 Diabetes, Sex Dis, 32, 3-13, DOI 10.1007/s11195-013-9337-1

Stankunas M et al (2006) Duration of unemployment & depression: A cross-sectional survey in Lithuania, BMC Public Health, 5, 6, 174.

Thakar R (2009) Review of the current status of female sexual dysfunction evaluation in urogenecology, Int. Urogencol J, 20 (suppl) S27-31.

Vaccaro C et al (2014) Female sexual function & the clitoral complex using pelvic MRI assessment, Eur J Obstet Reprod Biol, 180, 180-5.

Vafaeimanesh J et al (2014) Evaluation of sexual dysfunction in women with type 2 diabetes, Indian Journal of Endocrinology & Metabolism, 18, 175-9.

Wallen K & Lloyd E (2011) Female sexual dysfunction: Genital anatomy & orgasm in intercourse, Hormones & Behaviour, 59, 780-792.

World Health Organisation (2014) Sexual Health, http://www.who.int/reproductivehealth/icpd/en/ (accessed 010215)

Yang J et al (2009) Predictors of depression in Chinese community dwelling people with Type 2 Diabetes, Journal of Clinical Nursing, 18, 9, 1295-1304.