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Sexual Dysfunction after Stroke: Underestimating the Importance of Psychological and Physical Issues

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Abstract

Sexual dysfunction is common following stroke. However, it is often neglected during rehabilitation along with the psychological issues that may affect sexual dysfunction. Consequential to stroke is often low self-esteem, depression, anxiety, fear of another stroke, rejection by a partner or spouse, impotence, problems communicating due to aphasia or unwillingness to communicate, and role changes. Mobility problems, fatigue, hyper-sexuality, previous illnesses, and medication also have a negative effect on sexual dysfunction. The complexities of physical and psychological issues together with their interaction, is consideration together with recommendations from research and rehabilitation.

Introduction

According to World Health Organisation, in 2005 stroke accounted for 5.7 million deaths worldwide, which is equivalent to 9.9% of all deaths (WHO, 2011). In England, stroke is the third most common cause of death where an estimated 110 000 people have a stroke each year and over 300,000 people live with moderate to severe disabilities caused by a stroke (Ibbitson, & Thompson, 2011).

A stroke can be explained as 'a sudden attack or weakness affecting one side of the body, resulting in an interruption to the flow of blood to the brain by thrombosis or ruptured aneurism' (Thompson & Morgan, 1996, p2). The mortality rate is high with an estimated 20% of stroke patients dying in the first 20 days (SIGN, 2010).

Hales (2007) claims that 80% of strokes are preventable through lifestyle changes and the use of medication. The key risk factors that need to change are hypertension, smoking, diabetes, and cholesterol. Treating or managing these risk factors can lower the risk of a stroke. However, when stroke does occur, there are wide ranging consequences for all areas of functioning including physical, sensory, perceptual, cognitive and behavioural (Teasdale & Engberg, 2005). This can cause problems such as hemiplegia (one-sided weakness), incontinence, dysphagia, and dysphasia (Thompson, 1998; 1999). Cognitive disturbances include problems with attention, awareness, learning, memory, and judgement. Psychological problems can include depression and anxiety (Pfiel, Gray, & Lindsey, 2009).

Stroke rehabilitation has improved dramatically over the decades especially in terms of occupational therapy (Thompson, 1987a,b; Thompson, & Coleman, 1987; 1988; 1989; Thompson, Coleman, & Yates, 1986; Thompson, Hards, & Bate, 1986; 2011a,b) and psychological support (Thompson, 2010). However, one area often neglected is the effect of stroke on sexuality.

In the past, there has sometimes been a tendency by professionals to consider stroke patients as asexual simply because they are generally older as well as disabled, despite the fact that for those who have suffered a stroke, their sexual functioning is important and possible for them, though hampered by dysfunction (Lemieux, Cohen-Schneider, & Holzapfel, 2002).

Sexuality & dysfunction

According to Shah (2009) sexuality comprises more than just sexual intercourse. It is a complex phenomenon that includes psychological, biological, behavioural and interpersonal, dimensions. A key part of human life is the ability to create and sustain intimate relationships (Shah, 2009).

The cerebral cortex influences sexual arousal and response and the limbic system and hypothalamus play an important role in the integration and control of reproductive and sexual functions. Sexual arousal can occur without any sensory stimulation (Shah, 2009).

In the general population, approximately 40-45% of women and 20-30% of men are thought to have at least one sexual dysfunction (Shah, 2009). Dysfunction increases with age with common risk factors being general health, psychiatric and psychological disorders and socio- demographic conditions. For men, common sexual dysfunction includes decreased desire, erectile dysfunction and ejaculation problems (Wylie, & Kenney, 2010). For women, desire, arousal, orgasm or sexual pain are the common forms of sexual dysfunction (Jha, & Thakar, 2010).

However, after a stroke, sexual dysfunction is much higher with approximately 57-75% of patients suffering some form of sexual dysfunction (Korpelainen, Nieminen, & Myllyla, 1999; Monga, Lawson, & Inglis, 1986). As stroke may have a greater disability impact than perhaps any other long term condition.

Psychological factors

Sjogren and Fugl-Meyer (1982) studied the impact of hemiplegic stroke on the frequency of sexual intercourse and leisure activities. One-hundred-and-ten (71% male; 29% female) participants, all having suffered one hemiplegic stroke, and younger than 66 years old, were included. All had been discharged home at least two months prior to the study. One hundred participants were married or cohabitated; 34% of participants had aphasia; 61% had hypertension; 10% had suffered a myocardial infarction; 12% had diabetes. Of the participants, 102 were sexually active before the stroke; changes in sexual activity were determined by whether participants maintained their pre-stroke frequency of intercourse or had experienced decrease or cessation.

The results showed that gender, relationship status, time between stroke and research, touch (intact vs impaired), aphasia or illness pre stroke, was not significantly correlated to coital frequency being maintained or decreasing. Coital frequency, for 72% of those who were sexually active before the stroke, had rapidly and permanently reduced. Decreased frequency or cessation of intercourse was found in significantly more hemiplegics than hemiparetics, with 15% of hemiplegics having intercourse. This is not surprising as hemiplegia is complete paralysis of one side whereas hemiparesis is weakness of one side. The participants with no motor-impairment showed the same results as the hemiparetics.

Sexual activity was linked significantly with activities of daily living (ADL) dependence. All who were dependent reported a decrease with two thirds having stopped intercourse. Therefore, the more dependent the person, the greater the reduction in sexual activity. Those who depended on their partners for help had lower levels of sexual activity than those who were single, with the partner taking the role of a 'mother figure', leading to changes in sexuality. This finding shows that change in roles can affect sexual dysfunction (Sjogren, & Fugl-Meyer, 1982).

Those who had no motor impairment had reduced frequency of intercourse; therefore, movement problems were not specifically important for sexual dysfunction. Sexual activities were also influenced by problems with touch. Skin sensation deficits of half the body rather than sensory impairment of the genitals influenced the non-verbal sexual communication negatively (Sjogren, & Fugl-Meyer, 1982). Therefore, sexual levels are affected by several factors in addition to psycho-social and interpersonal status.

According to the authors, interpersonal factors could have triggered sexual dysfunction. Reactive depression, anxiety and fear of relapse could have led to reduced sexual drive. Unsuccessful coping may reinforce the symptoms due to a lack of information necessary for initiating successful coping. Denial could also block cognitive processing of information. In fact, psychological problems may affect sexual dysfunction more than physical (Sjogren, & Fugl-Meyer, 1982). This study demonstrates that the physical problem of hemiplegia can change the role between patient and spouse after a stroke and thus negatively affect sexuality. Also, psychological issues resulting from the impact of hemiplegia on the patient, such as depression, anxiety and fear are more important for sexual dysfunction.

Sjogren, Damber and Liliquist (1983) and Sjogren (1983) support the role that psychological factors have in affecting sexual dysfunction in hemiplegic patients. Sjogren (1983) supports the notion that change in role, between patient and spouse, is a contributory factor since patients changes from being a participator to a psychologically maladjusted spectator due to performance anxiety (Duits, et al., 2009) and fear of relapse. Not being able to perform according to their expectation, leads to reduced self-esteem and in turn, they became a frustrated sexual spectator. Role expectations and role changes control both the patient's and partner's adjustment to the new life situation. The spouse becomes ambivalent towards sex. Female participants in particular, thought fatigue was responsible for the decrease in sexual enjoyment which can be a symptom of reactive depression and may reinforce avoidance (Sjogren, 1983).

Boldrini, Basaglia and Calanca (1991) found spouses of hemiparetic patients had changes in sexual life with differences between men and women, and an association between changes in sexuality and clinical features of the hemiparetic patients.

Eighty six patients, all sexually active before their stroke, took part. A structured interview based on a questionnaire was carried out, with patients being asked about how stroke influences some behavioural features of sexual function and about personal feelings concerning sexual life after the stroke. Eleven male patients had no erection problems before their stroke but difficulties afterwards, and 4 who reported post-stroke erectile difficulties had pre-stroke problems. Normal ejaculation was reported by 37 before the stroke, and premature ejaculation by two participants.

Sexual life changes were perceived as a negative change in patient's attitudes toward sexuality, including a decrease in sexual interest or a feeling of unattractiveness. However, most of the patients reported no change in satisfaction from intercourse.

Spouses thought that the patients were increasingly anxious, irritable and showed a depressed mood. The overall changes in their own sexual lives were akin to those expressed by the patients - that they always reported negative changes, often related to the concern that sexual activity could be dangerous for the patient (Boldrini, Basaglia, & Calanca, 1991). Physical reasons and the side of the lesion did not seem to be essential in determining changes in sex life; such changes can be better explained in terms of psychological maladjustment or interpersonal factors.

Communication problems, between patients and spouses, have been found to affect sexual dysfunction in a study by Hawton (1984). Fifty men (mean age of 49.1 years), who had suffered moderate-to-severe strokes, were interviewed using a semi-structured interview 3 months following the stroke, about their sexual adjustment. For the majority, sexual interest had returned to their pre-stroke level but only 18 had resumed sexual intercourse. Some felt that their sexual activity had stopped forever. The author states that one factor which may have prevented resumption of sexual activity was inability for the partners to discuss this aspect of their relationship.

Hawton (1984) suggests that as several of the men were suffering from depression (24%) or anxiety (18%) following their strokes, this could have had significant effects on sexual interest and response, making communication more difficult between stroke patient and spouse, therefore, affecting sexual dysfunction. Again, physical factors did not affect resumption of sexual activity; therefore, it appears to be psychological rather than physical issues affecting sexual dysfunction.

One limitation of this study was that it did not include female participants; also, perhaps the study was conducted too soon after the stroke for the participants to have resumed sexual intercourse. Korpelainen, Nieminen and Myllylä (1999), found similar results to Hawton (1984) and that an inability to discuss sexuality was an important explanatory factor for a marked decline in sexual functions.

Monga, Lawson, and Inglis (1986) asked 192 stroke patients (117 men; 75 women) and 94 spouses to complete a self-administered questionnaire regarding their pre- and post-stroke sexual functions and habits. They found reduced libido in 57% of patients and 65% of spouses. This was explained by the patient's general attitude towards sexuality, fear of impotence, and functional disability. A significant association was found between the depression score and post-stroke libido, coital frequency, erectile capacity, vaginal lubrication, orgasm ability, and satisfaction with sex life. Changes in sexual function after the stroke were not related to the gender and marital status of the patients, type of stroke, or lesion location.

Left-sided lesions was seen to have an effect in Keppel and Crowe's (2000) study exploring the effects of a first stroke on body image and self-esteem in 33 participants (20 women; 13 men) who recorded retrospective and current ratings of self -concept.

Self-esteem was negatively affected following stroke. Post-stroke self-esteem ratings correlated with post-stroke ratings of body image. Those with left hemisphere lesions had significantly lower body image ratings than those who had a right hemisphere lesion. The authors claim that the levels of awareness of deficits are linked to feelings of self-worth. Therefore, the more a person is aware of their impairments and what this means for their future functioning, the lower their feelings of self-worth.

Right-side damage is associated with being unaware of physical and cognitive impairments compared to left-side damage. 'Neural lesions in the right hemisphere affect visual attention, spatial awareness, and somatosensory stimuli causing the patient to extinguish the left side of the body'(Keppel, & Crowe, 2000, p12). Perhaps this could explain why those with sensory disturbances in Aloni and colleagues (1994) study had reduction in desire - those with left-sided lesions, may have damage to the motor cortex resulting in speech and physical difficulties. As patients are aware of their problems these negative influences on body image and self-esteem following left-sided lesions appear to be more psychologically based.

Post-stroke depression is more commonly associated with left lesions and low self-esteem is linked to the development of depression (Keppel, & Crowe, 2000). Body image can be linked to depression through its impact on self-esteem. Therefore, damage to the left hemisphere can cause body image problems, which in turn creates low self-esteem and then depression, which can theoretically cause sexual problems.

High rates of depression post-stroke and its' effect on sexuality is supported by Kim and Kim (2008). Smith and colleagues (2003) found that it caused friction between patient and spouse; Ramasubbu and colleagues (1998) found that those with depression also reported worse functioning before the stroke. Perhaps depression had affected their judgement on pre-stroke sexual functioning. Another interesting finding was the fact that lesion location only affected

men. However, limitations of this study include the fact that it only focused on libido and satisfaction and that other aspects of sexual dysfunction were not researched. Also, the questionnaire required the researcher to make a clinical judgement about the existence of sexual dysfunction that could be subject to bias.

Buzzelli and colleagues (1997) found that the side of lesion was not important in sexual decline. The aim of the study was to collect and compare data on sexual change a month and a year after stroke and compare the relationship between sexual behaviour, age, education, number of years of marriage, depression, and disability level. Eighty six participants, who had suffered one stroke a month before, took part in a structured interview which assessed: number of sexual intercourses per week, when sexual life started again, changes in desire, changes in sexual positions, satisfaction, medication taken, and importance of sex life. Patients and partners were interviewed; however, those suffering from aphasia were excluded.

Thirty three per cent of patients and 34.5% of partners reported sexual decline whereas 8 patients (11.1%) had a slightly increased activity. Of the patients, 83.3% who resumed sexual activity did so 3 and 6 months after stroke. Erectile problems were reported by 60% and 29% complained about the quality of their erection and ejaculation. Gender, age, education disability, depression nor damaged hemisphere accounted for the sexual decline. Marriage duration had a negative influence on sexual intercourse after stroke. According to the findings, the main problems were the fear of relapse experienced by both patient and partner, the belief that sexual life only belongs to healthy people and the 'turned off' partner who complained of lack of excitation or even horror. Therefore, the results of the study again endorse the opinion that psychological issues and interpersonal relationships rather than medical ones account for disruptions of sexual function in stroke survivors.

Physical

Following a stroke, there are many physical problems that can affect sexual functioning. Some of these include erection and ejaculation, and vaginal lubrication and orgasm problems in men and women, respectively, and also mobility problems. A normal functioning neuroendocrine system is required for normal sexual function; however, in a few stroke survivors, neuroendocrine changes occur. Neuromuscular changes that affect mobility can occur such as fatigue, weakness and spasticity (Shah, 1999).

A number of studies (Chambon, 2011; Green, & King, 2009; Kimura, et al., 2001; Lemieux, Cohen-Schneider, & Holzapfel, 2002) found that mobility problems affected sexual functioning. Schmitz and Finkelstein's (2010) study of 15 stroke survivors and 14 partners found that physical problems affected sexual function. Hawton (1984) found that physical problems caused by stroke had posed difficulties during sexual activity, especially during sexual intercourse. Frequently reported was weakness and problems getting into sexual positions for intercourse. Other problems included pain and flexor spasms.

Sensation problems

Problems with sensation are other factors which affects sexual dysfunction (Giaquinto, et al., 2003). Korpelainen and colleagues (1998) assessed the impact of stroke on sexual behaviour of stroke patients and their spouses (38 men; 12 women) aged 32 to 65 years. Changes in libido, coital frequency, erection, ejaculation, vaginal lubrication, and satisfaction with sexual life were explored. Only married patients who were sexually active before the stroke were included in the study. Those over 65 years, those with previous illnesses, severe aphasia or major psychiatric problems were excluded.

Results indicated that for 19% of stroke patients and spouses, sexual problems were due to sensory deficits. Compared with patients who had normal sensation they had a higher rate of sexual dysfunction with lower libido, erectile dysfunction, and orgasm problems and more often dissatisfied with their sexual life.

Intact sensation is extremely important in sexual arousal and orgasm. It is therefore, understandable that sensory problems are related to problems with erection, ejaculation and orgasm resulting in impaired libido and quality of sexual life.

Post-stroke fatigue

Post-stroke fatigue is another significant problem. Sjogren (1983) conducted a study into the sexual life of 51 hemiplegic or hemiparetic stroke victims using a structured interview (39 males with a mean age 54 years; 12 females with a mean age 50 years). Erectile problems were high in males along with fatigue, which was also the main cause of reduction in pleasure for females. No patients in this study thought that problems were caused by spasticity or decreased mobility; however, two did feel that extra-genital pain had led to reduced sexual enjoyment.

Sjogren (1983) speculated that fatigue may be a symptom of reactive depression. Also, the high rate of fatigue among females may reinforce post-stroke avoidance of unrewarding sexual intercourse. Although fatigue is a physical outcome of stroke, it can cause psychological issues. One limitation of this study is the large difference in ratio of male and female participants. This could mean the results are

not as generalizable to the female stroke population. The use of an interview could reveal more specific information regarding the views and opinions of the participants. However, as it is a structured interview, the participants may not have had as much freedom in their answers as if it were a semi-structured interview.

Fatigue may reduce autonomy and cause feelings of guilt and also the patient's outward appearance, in particular facial asymmetry and drooling, may cause problems and reluctance for physical contact with their spouse. Van der Werf and colleagues (2001) suggest there is a relationship between post-stroke fatigue and depression.

Hypersexuality

Hypersexuality has been found in a few cases following stroke. Monga and colleagues (1986) described 3 cases of hypersexuality in 1 male and 2 females who were all married. Aspects of Hypersexuality included increased libido, stripping inappropriately and touching genital areas. The authors claimed that 'hypersexuality and abnormal sexual behaviour could either be part of the temporal lobe seizure activity or may manifest in patients with unilateral and bilateral temporal lobectomies'. Unilateral temporal lobe lesions were present in all 3 cases, although involvement of the frontal lobe was present in cases 1 an 3. In cases 1 an 3 the hypersexuality had been noted a few weeks before the onset of seizure activity, and control of seizures with medication did not improve the abnormal sexual behaviour. In case 2 the hypersexuality started after seizures but the seizures were under control by the time hypersexuality had occurred. Involvement of the temporal lobe was the only common factor in all 3 cases. As this was not an empirical study the results cannot be generalised but it is interesting to see the similarities between the 3 cases and differences and what could possibly cause hypersexuality.

Hypersexuality has been found in stroke patients with temporal lesions (Giaquinto, et al., 2003). Korpelainen and colleagues (1999) found that hypersexuality can be a reversible side effect of moclobemide (an anti-depressant medication). This is an interesting finding as it is possible that hypersexuality can be reversed. It also means that professionals need to be mindful of the medication they prescribe to stroke patients in this respect.

Previous illness

Previous medical conditions can cause sexual difficulties (Shah, 1999). Hypertension and diabetes are important contributors to sexual dysfunction. The vascular problems diabetes causes can have an impact on arousal whereas cardiovascular disease may inhibit intercourse due to fatigue (Shah, 1999). Dysfunction in diabetic men has been found to range from 27-75% with erectile dysfunction, ejaculatory dysfunction and low libido commonly found in men with diabetes (Shah, 1999). The medications used to treat these illnesses can also affect sexual functioning.

Cheung (2002) assessed the effects of stroke on sexual functioning in 63 men and 43 women with mild or no disability. Patients completed a self-administered questionnaire. It was found that a decline in erection among male patients was associated with a mild disability and a history of hypertension, diabetes mellitus or atrial fibrillation. The decline in ejaculation was associated with a mild disability, an older age group, a history of hypertension, a belief that sexuality was important, a belief in stroke affecting sexual functions, and an unwillingness for sexual activity. For the women, a decline in vaginal lubrication was associated with a history of hypertension. This study shows that previous illnesses combined with psychosocial issues have a negative impact on sexual dysfunction. This is supported by several studies (Aloni, et al., 1993, Korpelainen, et al., 1999).

Medication

Medication can have adverse effects on sexual functioning. Selective serotonin reuptake inhibitors (SSRIs) are commonly used to treat post-stroke depression. However, sexual dysfunction is a side-effect (Shah, 1999). Certain medications do not induce sexual dysfunction, including bupropion, mirtazapine, and nefazadone (Ferguson, 2001; Gelenberg, et al., 2000; Kavoussi, et al., 1997). Beta blockers and diuretics have the most negative effects on sexual performance with erectile dysfunction being associated with propranolol and thiazide diuretics (Shah, 1999).

Anti-depressants, anti-convulsants and anti-hypertensives have been shown in a few studies to affect sexual dysfunction following stroke (Bener, et al., 2008; Sjogren, 1983; Sjogren, & Fugl-Meyer, 1981; Tamam, et al., 2008). Hawton (1984) found that medications being received by male stroke patients included anti-hypertensives (30%), anticonvulsants (18%), anticoagulants (18%), analgesics (18%), diuretics (14%), hypnotics (10%), muscle relaxants (10%), vasodilators (6%), antidepressants (8%), hypoglycaemic agents (6%), and minor tranquilisers (6%), as well as a number of other preparations. Many of these have negative effects on sexual interest and response.Kennedy and colleagues (1999) assessed disruptions in sexual drive and desire and arousal and orgasm in 107 (42 men; 65 women) patients who had major depression and were treated with either moclobemide, paroxetine, sertraline or venlafaxine. Men experienced a significantly greater level of

impairment in drive and desire due to medication compared to women; whereas between men and women, there were no significant differences in levels of arousal or orgasm impairment. For men, impairment in drive and desire ranged from 38-50% and from 26-32% for women. Anti-depressant-induced sexual dysfunction occurs in approximately 30-70% of patients who are treated with sertraline or paroxetine. Lower rates are reported with moclobemide and venlafaxine. This study therefore supports the negative effects of anti-depressant drugs.

Discussion

The change in role between a patient and spouse can have detrimental effects on sexual functioning (Sjogren, & Fugl-Meyer, 1982). Also, psychological issues resulting from the impact of hemiplegia on the patient, such as depression, anxiety and fear are more important for sexual dysfunction.

Decline in authority within the family in Boldrini, Basaglia, and Calanca (1991) study was expressed by the men as negatively affecting their relationship with their wives, with anxiety and frustration being often reported. Participants felt a lack of self-esteem or fear of being refused by their spouses because of the stroke, with a decrease in sexual interest or a feeling of unattractiveness. Tamam and colleagues (2008) found that an inability to discuss sexuality with their partner was explanatory for the decline in coital frequency and sexual satisfaction, along with unwillingness for sexual activity. Whereas, Hawton (1984) stated the inability for the couples to discuss sexuality may have prevented resumption of sexual activity.

The change in roles that occurs causes resentment, ambivalence and embarrassment for both parties, which in turn reduces coital frequency and desire, and as such may be a key factor influencing sexual dysfunction following stroke as the life a person or couple was used to can change dramatically. This can have a profound effect on people's lives and again is linked to self-esteem, anxiety and depression for patient and spouse alike.

A stroke does not just affect the sufferer but also their spouse, in all aspects of life. Partners can feel 'turned off' by their partner's physical condition or due to cognitive changes which makes them appear unattractive or which forces the spouse to become like a parent. Spouses can also be afraid of causing more harm (Allsup-Jackson, 1981; Banks, & Pearson, 2004; Tamam , et al., 2008). This can lead to reduced desire and coital frequency.

Allsup-Jackson (1981) demonstrates how this reaction can have negative effects on the patient. The patient feels unattractive and unable to meet their partner's needs and their spouse's reaction only reinforces this feeling, creating lower self-esteem which can lead to avoidance of the partner and avoidance of intimacy and intercourse. Those who reported a greater amount of change in their lives following stroke also reported the greatest amount of depression, feelings of alienation and a poor sexual relationship with their spouses (Allsup-Jackson, 1981). Many found that the 'mother' role led to decline in libido and sexual intercourse. This complex change in the dynamics of the relationship can change sexual dysfunction considerably and therefore, couples may benefit from counselling couples in order to try and redress these changed roles.

Physical outcomes of a stroke have an important influence on sexual dysfunction especially when they interact with psychological problems. Neuromuscular changes that affect mobility such as fatigue, weakness and spasticity, and previous medical conditions and medications can have an impact (Shah, 2009). Mobility problems such as paralysis are common after a stroke and cause problems with sexual positioning.

Post-stroke fatigue, although a physical outcome, may be a symptom of reactive depression. The high rate of fatigue among females may reinforce post-stroke avoidance of unrewarding sexual intercourse. It may also be linked to role changes and guilt in the patient which can lead to sexual dysfunction.

Medications used to treat prior medical conditions do have side-effects which cause sexual dysfunction and should not be under-estimated. Kennedy and colleagues (2000) found that anti-depressant-induced sexual dysfunction occurs in approximately 30-70% of patients who are treated with sertraline or paroxetine. Lower rates are reported with moclobemide and venlafaxine. Special care needs to be taken when prescribing medication with regards to the effect they have on sexual function as this can lead to psychological problems, which in turn may lead to further sexual dysfunction.

One debate is whether the hemisphere has an effect on sexual dysfunction. It is interesting to note that following left hemisphere damage, it was found by Keppel and Crowe (2000) that people are more aware of their deficits, which can cause impaired body image and low self-esteem and possibly depression. Hyun and colleagues (2006) claim that sexual problems in stroke patients with a right-sided lesion may be due to poor sexual arousal, as right hemispheric lesion affects perception of complex visual stimuli, emotions and emotionally laden visual stimuli. This could explain

why some patients with right-sided lesions have low desire. Patients may show decreased desire also due to anxiety, impaired self-image and body image.

It is expected that damage to the areas of the brain that are involved in sexuality could affect sexuality in some way, but what is not so clear is how the same psychological issues can appear after a right- or left-sided lesion. Bhogal and colleagues (2004) found that left hemisphere damage contributed to the development of post-stroke depression in hospital inpatients but right hemisphere damage contributed to post-stroke depression in community study patients. Perhaps this could have been due to the fact that those with left-sided lesions are more aware of deficits and so notice them in hospital sooner than those with right-sided damage. This shows that there is more to it than just which side of the brain is affected and certainly, this subject needs further investigation.

Sexuality is a combination of physiological reactions, thoughts, feelings and memories and so it is not surprising that aspects such as desire can be affected by damage to different areas. This shows the complex nature of sexuality and how it is an integration of psychological and physical aspects. The brain is not neatly sectioned into different functioning areas; it is inter-linked which makes it sometimes difficult to determine what exactly is happening when the interaction between specific brain lesions and psychological issues present with sexual dysfunction in stroke patients.

Technological advances in MRI scan techniques can show how different brain areas are used in different situations and might explain some differences between the findings of the earlier studies. However, despite the advancement in technology, it is still difficult to ascertain the reasons for the same psychological issues still occurring in the findings throughout the years.

Methodological differences between the studies could have an impact on results and should always be considered. Along with this, participants differ widely in studies. Every patient is a unique individual with different outcomes, relationship status, gender, age, previous illnesses and current medications, different lengths of time since stroke, and different levels of disability.

It would seem, however, that men are overwhelmingly represented in the research compared to women. One reason could be due to cultural and religion, and that female participants, generally, may be less free to discuss to sexual issues in some societies or especially to male researchers.

Telephone interviews can help in this respect although they bring their own advantages and disadvantages. Advantages may be that participants get to participate in their own homes which will benefit those with more severe movement problems and it can be conducted in a more relaxing environment. Disadvantages include the possibility of researchers missing important non-verbal cues from the patient when following a particular line of questioning. It is far less personal which might be more comfortable for some, but for others, they may be more embarrassed as they do not get to know the researcher properly. Also, the participant may get distracted with what might be happening in their home whilst on the telephone.

Self-report questionnaires are also useful in that they encourage participants to supply their own perspective on their problems although results may not be generalizable if participants are embarrassed about the content and may not reveal the true extent of their problems.

Various scales have been successfully used in past research. The Functional Independence Measurement was used in Buzzelli and colleagues (1997) study; and the Rankin score for disability was used by Cheung (2002). In Tamam and colleagues (2008) study, the well-known Barthel Index was used to measure disability which is recognised as a reliable and valid measurement in stroke patients. The Beck Depression Inventory was used in Buzzelli and colleagues (1997) study and also in Cheung (2002) study to assess depression. An alternative tool is the Hamilton Rating Scale for depression as used in Tamam and colleagues (2008) study and by Kimura and colleagues (2001), to assess severity of depression in participating stroke patients and spouses.

Conclusion

More in depth and longitudinal research needs to be conducted to ascertain how exactly psychological problems interact with physical outcomes of stroke and their effects on sexual dysfunction.

As depression is so prevalent post-stroke and has an effect on rehabilitation and sexual dysfunction (Berg, et al., 2005; Gaynes, et al., 2002), it is important for those involved in rehabilitation to identify and treat depression, not just in the patient but also in the spouse. Post-stroke fatigue is also linked to depression and is common after stroke (Mead, et al., 2011), yet the causes remain unclear.

Counselling couples for sexual dysfunction after stroke is often infrequent and not available yet is of paramount importance if only to identify and give recognition to difficulties even if they cannot be fully resolved. Being able to express concerns and

difficulties with somebody neutral to help mediate a problem could help understand the difficulties of each other in the relationship and may even save a relationship or marriage. The psychological wellbeing of both patient and spouse is very important to the resolution of sexual dysfunction following stroke.

Patients can be given factsheets and booklets by the Stroke Association (2009) to help them learn about and expect certain physical and psychological outcomes of a stroke. There is also information available about possible causes of sexual dysfunction following stroke and the help that may be available. Song and colleagues (2011) claim that it is important for patients to understand that the most serious causes of decreased sexual satisfaction and frequency are psychosocial. It is up to us, as professionals to both educate and provide services that adequately support the stroke patient as well as their spouse in this sensitive but important area of life quality.

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