Men’s Health: Sexual Dysfunction, Physical, and Psychological Health—Is There a Link?

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ABSTRACT

Introduction. Sexual dysfunction in men, such as erectile dysfunction, hypogonadism, and premature ejaculation, generates considerable attention. Its association with physical and psychological health is an issue which should be addressed seriously.

Aim. A review of the literature pertaining to the correlation between sexual dysfunction and physical and psychological health.

Methods. PubMed search for relevant publications on the association between sexual dysfunction in men and physical and psychological health.

Main Outcome Measure. Clinical and epidemiological evidence that demonstrates the association between sexual dysfunction in men and physical and psychological health.

Results. Sexual dysfunction, i.e., erectile dysfunction, hypogonadism, and premature ejaculation, has been shown to be associated with physical and psychological health. There is a strong correlation between sexual dysfunction and cardiovascular disease, metabolic syndrome, quality of life, and depression.

Conclusion. The association between men’s sexual dysfunction and physical and psychological health is real and proven. Therefore, it should not be taken lightly but instead treated as a life-threatening medical problem.

Key Words. Health; Physical; Psychological; Sexual Dysfunction

Introduction

Sexual health is defined as a state of physical, emotional, mental, and social well-being related to sexuality. It is not merely an absence of disease, dysfunction, or infirmity, and it requires a positive and respectful approach to sexuality and sexual relationship [1]. Sexual dysfunction in men encompasses erectile dysfunction, testosterone deficiency (hypogonadism), and ejaculatory disorders, particularly premature ejaculation. With aging of the world population, the prevalence of sexual dysfunction, particularly erectile dysfunction, is projected to increase markedly.

About 100 million men worldwide are affected by erectile dysfunction, and this is expected to increase to 322 million in 2025 [2]. Similarly, men’s serum testosterone decline progressively after the age of 40 [3–5]. The prevalence of adult males with low serum testosterone (total testosterone <10.4 nmol/L or 300 ng/dL) ranges from 10–25% [6]. However, prevalence of symptomatic androgen deficiency in adult male is around 10% [7]. In the Global Study of Sexual Attitudes and Behaviors, which surveyed the various aspects of sexual health among adults aged 40–80 years in 29 countries, the overall prevalence rate for premature ejaculation was 30% [8].
Despite the availability of effective treatment for erectile dysfunction, testosterone deficiency, and premature ejaculation, a large group of men affected by sexual dysfunction are not receiving appropriate treatment [8]. It might be due to the skepticism of the relationship between sexual dysfunction and their overall health. In this review, we would like to explore the current evidence for the relationship between psychological and physical health.

Methods
We conducted a literature search using PubMed from 1970 to 2010. The following Medical Subject Heading terms were used: “sexual dysfunction,” “erectile dysfunction,” “hypogonadism;” and “men” or “male;” and “quality of life” or “mental health” or “chronic disease” or “mortality” or “morbidity” or “epidemiology”. This was supplemented by key words search using the following terms and their synonyms: “sexual health,” “testosterone deficiency,” “cardiovascular risk,” “non communicable disease,” “diabetes,” “hypertension,” “obesity,” and “stroke”. Inclusion criteria for article selection were: articles in English, studies (of any design) on sexual dysfunction in men, and publication in a peer-reviewed journal. The abstracts and full text of the articles, identified from the initial search, were reviewed by two authors independently, who subsequently reached a consensus on adding each included article. The reference lists of identified articles were reviewed manually for additional relevant articles. Additional studies, recommended by expert peer reviewers, were examined and added.

Sexual Dysfunction and Quality of Life (QoL)
Many studies have shown that sexual dysfunction and QoL are closely interrelated [9–15]. Men bothered by sexual problem were more likely to have lower overall life satisfaction scores, mental health QoL scores, and vitality QoL scores. Perceived physical health was also found to be independently associated with sexual satisfaction and various sexual problems. Specifically, erectile dysfunction is the main male sexual problem associated with mental health QoL [9].

Sexual problems have also been attributed to other physical, clinical, and psychological factors [10,16]. Patients with erectile dysfunction had been shown to have significant adverse effects on both physical and mental health dimension of QoL [12,13].

Sexual Dysfunction and Physical Health
Many recent publications have clearly demonstrated that physical health is associated with sexual health. Numerous epidemiological studies have revealed a strong correlation between erectile dysfunction and cardiovascular risk factors that include hypertension, dyslipidemia, diabetes, and obesity [17–24].

Consistently, high prevalence of erectile dysfunction has been reported in men with comorbidities like cardiovascular disease, hypertension, diabetes, and stroke [25–29]. Similarly, men with erectile dysfunction are more likely to report having comorbid medical conditions [30–32]. In the original Men’s Attitudes to Life Events and Sexuality (MALES) and Asian MALES studies, the prevalence for cardiovascular disease and diabetes were two to three times higher in men with erectile dysfunction compared with men without erectile dysfunction [30,32].

Current knowledge supports the notion that erectile dysfunction is a sentinel marker for cardiovascular disease and stroke [26,33–40]. This is attributed mainly to shared pathophysiological mechanism and arterial occlusion [33,37,41–46] and common risk factors [47–51]. It is believed that progressive occlusive disease should manifest early in smaller vessels in the penile bed before involving larger coronary vessels [20,37,38]. Further, the penile arteries are end arteries and are thus less able to compensate for decrease blood flow as does in the heart and brain. As such, patients with a recent onset of erectile dysfunction often do not complain of symptoms of cardiovascular disease, and patients with cardiovascular disease commonly give a history of preceding erectile dysfunction [20]. Erectile dysfunction can therefore be considered an early marker for cardiovascular risk and preclinical cardiovascular disease [52].

Many studies have revealed that obesity, i.e., high body mass index was associated with prevalence and progression of erectile dysfunction, indicating that obesity is a risk factor for cardiovascular disease [53,54]. Further, a study on the intervention of obese men aged 33–55 years revealed that reduction of ≥10% of baseline body weight over 2 years correlated with a significant improvement in erectile function, resulting in reduction of cardiovascular risk [55].
The pioneering work of Thompson et al. showed prospectively a group of asymptomatic, healthy men who had, or developed, erectile dysfunction and then subsequently developed cardiovascular events [21]. This strong association between erectile dysfunction and subsequent development of cardiovascular events and risk of cardiovascular mortality is further confirmed by the Olmsted County Study and the Massachusetts Male Aging Study (MMAS) cohort study [56,57]. Erectile dysfunction was also shown to predict multiple end points of various adverse cardiac events in both low [21,58] and high [59,60] cardiovascular risk population. The Thompson Prostate Cancer Prevention Trial study showed that in the 40–69 years age group, men with erectile dysfunction have about a twofold greater risk of cardiovascular disease than men without erectile dysfunction [21]. The Olmsted Country Study on community dwelling men showed that erectile dysfunction was associated with about 80% higher risk of subsequent coronary artery disease, especially in the younger age group [56].

In the MMAS prospective study that followed 40–70 year old men for 15 years, erectile dysfunction was positively associated with all causes of mortality and cardiovascular mortality in age and multivariate adjusted models [57]. Men with erectile dysfunction had a 26% higher risk of all-cause mortality and a 43% higher risk of death due to cardiovascular disease compared with men without erectile dysfunction. Erectile dysfunction was found to be comparable with a number of conventional risk factors such as hypertension, diabetes, and self-assessment of health [57]. In this study, erectile dysfunction was however not associated with other causes of mortality like cancer mortality.

The findings from these three key studies have major clinical and public health implications especially in the promotion of men’s health. The advent of effective oral medications for treatment of erectile dysfunction has prompted a huge population of men to seek treatment, providing the primary care physicians an opportunity to predict, detect, and treat men for cardiometabolic disease (cardiovascular disease and diabetes). The reported prevalence of silent coronary artery disease in patients with erectile dysfunction, ranged between 8% and 56% [20,60]. This observation is also supported by a study by Mulhall et al. showing men with vasculogenic erectile dysfunction had between six- to tenfold increased incidences of abnormal stress echocardiogram [61].

As 66% of sudden cardiac deaths and 20% of nonsudden cardiac deaths occur in patients without a history of coronary artery disease, and the fact that 70% of all erectile dysfunction is vascular in origin, physicians should pay particular attention to all men presenting with erectile dysfunction [62,63]. Furthermore, a large scale study of 25,650 men revealed a 75% increase risk of peripheral vascular disease in men with preexisting erectile dysfunction [64]. Often, the appearance of erectile dysfunction precedes symptomatic cardiovascular diseases by 1 to 5 years [21]. Educating and impressing men on the link between erectile dysfunction and cardiometabolic disease will motivate men to adhere to lifestyle modifications in primary and secondary prevention of the diseases.

Current knowledge has clearly shown the close association between erectile dysfunction and cardiometabolic disease and risk factors. This link is particularly strong for men above 50 years of age and with existing cardiovascular risk factors. There is still a large population of younger and healthy men with symptoms suggestive of organic erectile dysfunction of long duration and yet current cardiovascular assessments do not show any abnormalities [65]. There is definitely a need to conduct studies to detect subtle or early abnormalities of the penile vasculature both hemodynamically and biochemically. Confirmation of any physiological or biochemical disarrangement is vital to instill prophylactic or preventive measures.

The other common conditions affecting men’s sexual health are testosterone deficiency and premature ejaculation. Testosterone deficiency is a clinical and biochemical syndrome, frequently associated with age and comorbidities. It may affect the function of many bodily systems resulting in significant decline in the QoL including sexual dysfunction [66].

The clinical manifestations of testosterone deficiency are variable. Sexual dysfunctions like hypoactive sexual desire, erectile dysfunction, and delayed ejaculations are prominent presenting symptoms [67]. Other presenting features that affect physical health and QoL include visceral obesity, diminished muscle mass, muscle strength, bone mineral density, and alterations in spatial cognitions and mood [66]. Observational studies, both cross-sectional and prospective cohort studies, have revealed that testosterone deficiency is frequently associated with metabolic diseases [68–80]. Low testosterone is significantly associated with obesity (relative risk 2.38), type 2 diabetes (relative risk 2.1), metabolic syndrome and its
components, and insulin resistance [68–70]. The triad consisting of erectile dysfunction, metabolic syndrome, and testosterone deficiency is very prevalent and commonly reported [71–73]. Many cohort studies have shown that low testosterone levels predict type 2 diabetes and metabolic syndrome. Similarly, obesity, type 2 diabetes, and metabolic syndrome predict subsequent testosterone deficiency [77–80]. A meta-analysis by Isidori and colleagues revealed favorable results of testosterone replacement therapy with respect to decline in total fat mass and improvement in lean body mass [81].

Testosterone has been widely accepted as detrimental to the cardiovascular system. However, numerous epidemiological studies have suggested otherwise [82]. Nearly all epidemiological studies have revealed that high testosterone is not associated with cardiovascular disease [82]. The majority of studies have shown that testosterone level is inversely related to most cardiovascular risk factors and degree of atherosclerosis [82]. A majority of cohort studies revealed no correlation between testosterone levels and subsequent cardiovascular morbidity or mortality [82]. However, at least three recent studies have suggested significant correlations between low testosterone levels and either cardiovascular or all-cause mortalities [83–85]. Of concern to us are sporadic cohort studies that have reported weak but definite correlation between androgen levels and cardiovascular mortality [86–88]. More long-term, large scale, prospective randomized controlled trials of testosterone therapy looking at cardiovascular parameters and mortalities are urgently needed.

Premature ejaculation, which affects 30% of men in all age groups, is still a very stigmatized and distressing medical condition. Premature ejaculation is quoted as the most common sexual problem, and it is threefold more prevalent than erectile dysfunction in men below 40 years of age [10]. Current knowledge on premature ejaculation as a genuine organic sexual dysfunction related to serotonin dysregulation [89,90] and its association with medical conditions like prostatitis, chronic pelvic pain syndrome, varicocele, and thyroid disease [91–93] provide both physicians and patients, especially in the younger age group, an excellent platform to engage in health consultation and promotions. The advent of effective oral medication, specifically designed for premature ejaculation, and the dissemination of awareness of this common distressing sexual problems will provide a legitimate opportunity for men to seek medical consultation.

Sexual Dysfunction and Psychological Health

Besides QoL and physical health, sexual dysfunction is also related to psychological health. Depression is often seen in men with sexual dysfunction. In a study in Malaysia, men with erectile dysfunction had significantly higher geriatric depression scores compared with men without erectile dysfunction; i.e., a higher proportion of men with erectile dysfunction suffered from depression [94]. In Japan, it was shown that the odds ratio for an association between erectile dysfunction and depression was 2.02 [95]. In a cross-national study between Brazil, Italy, Japan, and Malaysia, depression was shown to be associated with erectile dysfunction in a graded manner, and men with erectile dysfunction were 2.09 times more likely to have depression [96].

In the study by Araujo et al., the estimated odds ratio for erectile dysfunction was 1.82 in the presence of depressive symptoms. What was more important was that they showed that this relationship between depressive symptoms and erectile dysfunction was independent of important aging and para-aging confounders, such as demographic, anthropometric and lifestyle factors, health status, medication use, and hormones [97]. Besides depression itself, antidepressant medication use also may cause erectile dysfunction. Conversely, it has also been shown that erectile dysfunction independently may cause or exacerbate depressive moods [98].

The diagnosis of depression among erectile dysfunction patients is affected by the manner by which it is diagnosed. When Strand et al. used categorical diagnosis such as the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), only a small number of erectile dysfunction patients were noted to be depressed. However, when measured dimensionally using the Brief Symptom Inventory, significant elevations of depression and other dysphoric affects were revealed. This demonstrates an important fact that men with erectile dysfunction are affectively distressed but infrequently meet the criteria for categorical DSM-IV depression [99].

Hypogonadism is also associated with depression. Levels of testosterone have been shown to be lower in depressed patients than in nondepressed individuals [100–104]. This relationship between low levels of testosterone and depression is more obvious in aging men. Elderly men who have depression or dysthymic disorder appear to have lower testosterone levels compared with nonde-
pressed elderly men [105–112]. Decreased testosterone levels were also seen in patients with schizophrenia who present with a depressive episode [113–115]. In a study in Asia, 30% of the hypogonadal men were found to have mild/moderate depression whereas 9.37% had severe depression [116]. This relationship between hypogonadism and depression is further strengthened by a systematic review and meta-analysis that concluded testosterone therapy may have an antidepressant effect in depressed patients, especially those with hypogonadism [117].

Serum testosterone level in the body is also greatly influenced by an individual’s emotional state. A sustained reduction in testosterone secretion can occur when faced with life stresses such as those caused by work or relationships. Positive emotional states on the other hand, will increase testosterone production [118]. Sleep deprivation has also been shown to cause low testosterone levels [119].

For premature ejaculation, the association with mental health was confirmed in a recent study from Malaysia, where the Hospital Anxiety and Depression Scale (HADS) was used to measure the psychological impact. In this study, the odds of having anxiety and depression among men with premature ejaculation were 2.83 (95% CI = 1.45–5.54) and 2.08 (95% CI = 0.97–4.44), respectively. It was also noted that the higher the HADS score, the higher was the prevalence of premature ejaculation. The prevalence of premature ejaculation was 13.6%, 41.5%, and 68.6% in those with low (0–7), medium (8–10), or high (>11) HADS scores, respectively [120].

Conclusion
Awareness of erectile dysfunction, testosterone deficiency, and premature ejaculation has increased substantially, and discussion on these issues between patients and health professionals is more open, less stigmatized, and easier to initiate, especially if the discussion is contextualized and confined to serious medical diseases. Men’s sexual dysfunction including testosterone deficiency syndrome should be highlighted as not just QoL but also as life-threatening issues.

Primary care physicians should be aware of the various sexual dysfunction issues and their relationship to various life-threatening medical conditions and diseases. In the promotion and maintenance of men’s health, the front line physicians should focus on age-specific clinical evaluation and provide the appropriate preventive or interventional measures.

There is a need for screening for all sexual dysfunction men for their physical as well as psychological health. Public health authorities also have a role in creating awareness by disseminating knowledge on this issue. Men’s sexual health across all age groups is indeed intimately related to men’s physical and mental health.

There is also a need for further research on the association of cardiovascular risks among young, healthy men with symptoms of erectile dysfunction. Research to detect subtle or early abnormalities of the penile vasculature both hemodynamically and biochemically will help in the formulation of prophylactic and preventive measures. Besides that, more robust, long-term, large scale, prospective randomized controlled trials of testosterone therapy looking at cardiovascular parameters and mortalities are urgently needed to confirm the benefits and safety of testosterone therapy. The association between premature ejaculation and physical health is another area that needs to be addressed.

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