

# Sexual Dysfunction in Men with Chronic Pelvic Pain Syndrome

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## ABSTRACT

Chronic pelvic pain syndrome (CPPS) is typically characterized by non-malignant genital or pelvic pain (in or around the prostate, penis, rectum, perineum and scrotum), that lasts for more than 3 months. Erectile, ejaculatory and other sexual dysfunctions are strongly linked with CPPS. Erectile dysfunction (ED), defined as the consistent inability to obtain and/or maintain a penile erection sufficient for adequate sexual intercourse, is also a common problem with a negative impact on quality of life. In CPPS patients, the prevalence of premature ejaculation, ED and ejaculation pain are high. Pelvic floor hypertonus is considered an underlying pathology in sexual dysfunction, specifically in sexual pain disorders and CPPS. Both CPPS and sexual dysfunction impair the overall quality of life in males; therefore, these conditions should be considered and treated together.

*Key words:* chronic pelvic pain, erection, dysfunction, ejaculation pain

## INTRODUCTION

Chronic pelvic pain syndrome (CPPS) is a non-malignant pain perceived in the organs surrounding the pelvis which has been persistent or recurrent for over three months. The occurrence of chronic pain is associated with changes in the central nervous system (CNS) that may maintain the perception of pain in the absence of acute injury. These CNS changes, also called CNS sensitization, may magnify pain perception so that non-painful stimuli under normal conditions are perceived as painful (allodynia) and painful stimuli are perceived as more painful than expected (hyperalgesia) [1]. However, the causes of CPPS remain elusive, multi-factorial and unclear even after several years of study. Different factors have been proposed in the etiopathogenesis of CPPS, such as viral infections [2,3], psychological stress [4], hormonal and neural factors [5,6], T-cell recognition of prostatic peptides [7], and possible autoimmune diseases [7-10]. It is usually difficult to manage CPPS because of difficulty identifying the pathophysiological origin. Currently, pelvic myofascial spasm and pain are viewed as important factors causing the symptoms of CPPS [11]. Psychological factors can also affect the development of chronic pain. Persistent pelvic pain and worry about tissue damage or the development of malignancies can cause psychological distress.

Sexual dysfunction, including erectile dysfunction (ED) and/or

ejaculation dysfunction, has been linked with CPPS. ED, defined as the consistent inability to obtain and/or maintain a penile erection sufficient for sexual activity [12], is a common problem affecting quality of life. In CPPS patients, the prevalence of premature ejaculation (PE), ED and ejaculation pain is high [13-16]. However, the specific effects of CPPS on sexual desire and dysfunction are difficult to identify. Pelvic floor dysfunction is proposed as the underlying pathophysiology in sexual dysfunction, specifically sexual pain disorders and CPPS. The aim of the present review is to provide an evidence-based correlation between CPPS and sexual dysfunction.

## PELVIC FLOOR ANATOMY AND FUNCTION IN MALES

The pelvic floor is a group of muscles shaped like a bowel. It contains three layers of muscle: the superficial perineal layer (bulbocavernosus muscle, ischiocavernosus muscle, superficial transverse perineal muscle and external anal sphincter); the deep urogenital diaphragm layer (compressor urethra muscle and deep transverse perineal muscle); and the pelvic diaphragm (levator ani, ischiococcygeus muscle, piriformis muscle and obturator internus muscle) [17]. These muscles are attached to the coccygeal bone and continue to the pubic bone. The outlets of the bladder and bowel pass through the pelvic floor. Basically, these pelvic floor muscles function to support pelvic floor organs, assist in urinary and fecal continence, aid in sexual performance, and act as venous and lymphatic pumps for the pelvis.

Generally, the organic causes of male ED involve the neurologic, vascular, or endocrine systems. However, pelvic floor muscle may also play a role in male sexual dysfunction. While the ischiocavernosus muscle facilitates enhancement of blood flow to the penis, the bulbocavernosus muscle involves in the maintenance of penile erection. Contraction of the bulbocavernosus muscle blocks venous leakage from the penile deep dorsal vein, and thus maintain a penile erection [18,19].

Ejaculation is controlled by the sympathetic nervous system and induced by active pelvic floor muscle contractions. During ejaculation, the bulbocavernosus muscle, ischiocavernosus muscle and external urethral sphincter show a significant increase in motor unit action potentials and rhythmic contractions. The onset of the ejaculation reflex can be delayed through intentional relaxation of the bulbocavernosus and ischiocavernosus muscles during arousal. This delay of ejaculation may be facilitated by "releasing" the levator ani muscles through relaxation of the pelvic floor muscles. Taken together, the pelvic floor muscle is important in male sexual function.

## PELVIC FLOOR DISTURBANCE IN CHRONIC PELVIC PAIN

Several groups have suggested that myofascial pain syndrome

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(MPS) with abnormal pelvic muscle spasm is the major source of the symptoms of CPPS [20,21]. Primarily, the pelvic floor musculature and pelvic organs share the same nervous innervations. The tissues overlaying the lower abdomen, pelvis and lower back are innervated through T10 to T12 anteriorly and L1 to S5 posteriorly into the anus and perineum [17]. These pelvic organs and pelvic floor muscles share the same neurologic reflexes as well and coordinate with each other. It is not clear how increased pelvic floor muscle tone is related to pelvic pain. These muscle spasms could be secondary to local pelvic floor infection or inflammation. Dysfunction of one pelvic organ may also affect others through the reflex mechanism.

In patients with MPS, palpation of the affected muscles can induce muscle guarding, cramping, spasm and pain. The persistent status of muscle hyperactivity has been described as hypertonus and is frequently associated with an increase in neurological tone rather than a pain response. Currently, no established laboratory test or imaging technique can diagnose MPS. A thorough physical examination with careful palpation and identification of the myofascial trigger point is mandatory. Zermann et al reported 88.3% of patients with CPPS had pathological tenderness of the striated pelvic floor muscle with poor to absent pelvic floor function [22]. They proposed that there is a CNS disturbance in the regulation of pelvic floor muscles because function and contraction of these muscles reflect neural control. Another report by Hetrick et al showed increased pelvic floor muscle tone (56.7% vs. 11.9%), enhanced muscle spasm (25.4% vs. 1.2%), and increased internal palpation pain (19.4% vs. 1.2%) in CPPS patients compared with controls [20].

The actual etiology of MPS in CPPS patients is still unclear. Activation of myofascial trigger points can result from a fall, automobile accident, or surgery in the pelvic region. However, in many cases, no history of injury can be identified. On the other hand, some physicians have implicated voiding dysfunction in childhood as the beginning of a long term process that finally results in pelvic floor dysfunction in adulthood [21]. A significant number of CPPS patients report a history of sexual or physical abuse at a young age, which may be a contributing factor to their pelvic floor disorders [23]. Generally, pelvic floor hypertonus is seen as an underlying pathology in sexual dysfunction, specifically sexual pain disorders.

### SEXUAL DYSFUNCTION IN MEN WITH CHRONIC PELVIC PAIN

Male sexual dysfunction can be classified into hypoactive sexual desire disorders, ED, ejaculation disorders (PE and post-ejaculation pain) and orgasmic dysfunction [24]. Although pain is the most significant symptom of CPPS, the available literature on the effects of chronic urogenital pain on the male psychology is limited. Although it is well recognized that chronic pain affects sexual function [25,26], there are few studies of the effects of chronic urogenital pain on sexual dysfunction. Unlike pain, urination and quality of life can be evaluated by the standard questionnaire of the National Institutes of Health-chronic prostatitis symptom index (NIH-CPSI) [27]. Most CPPS studies have ignored sexual dysfunction because of a lack of standardized measurements. At present, the most commonly used tool is the international index of erectile dysfunction (IIEF) questionnaire [28]. However, the IIEF is primarily used to measure ED. PE and post-ejaculation pain are not mentioned in the questionnaire, and there is only one question on

sexual desire and satisfaction.

Many patients with urogenital pain have trouble with sexual desire, arousability, satisfaction, and ability to achieve orgasm. Others avoid sex because sexual activity may worsen urogenital pain. In an unselected population-based study exploring psychological stress and personality in men with prostatitis, Mehik et al reported that 80% of prostatitis patients had a certain degree of psychological difficulty (anxiety, depression, affect lability, and weak masculine identity) [4] and 52% of prostatitis patients had periodic or total impotence or decreased libido [13]. Berghuis et al also reported that patients with chronic idiopathic prostatitis had a reduced frequency of sexual contacts (85%), and interference with or withdrawal from seeking new sexual partnerships (43%) [29]. In a recent study, 70% men with CPPS reported pain episodes decreased their sexual desire, and 39.5% men had increased sexual dysfunction problems [30].

ED is the most investigated sexual dysfunction in CPPS patients. The reported prevalence of ED ranges from 15.1% [15] to 48.3% [14], varying with the evaluation tools and populations. Lee et al [14], using an IIEF-5 score  $\leq 21$  as a cut-off point, reported a prevalence of ED of 48.3%, which increased with age, while men with ED had worse CPPS symptoms. Based on IIEF scores, more severe CPPS symptoms were related to not only a higher prevalence of ED, but also a greater severity of ED [31]. In addition, the prevalence of ED varies significantly with age. In a large-scale Chinese epidemiological report, the prevalence of ED in patients with chronic prostatitis was 17.3% at <40 years old, 37.3% at 40-49 years old and 41.2% at 50-59 years old, suggesting that ED is more common in men with CPPS than in healthy men ( $P < 0.01$ ) [15]. The documented prevalence of ED was 27.4% among Italian men aged 25-50 years [32], 15.2% among Turkish men [33] and 43% among Finnish men with CPPS [4]. A higher prevalence of ED was found in young men with CPPS than in the general population [34]. Nevertheless, there are limited studies evaluating the underlying pathology of ED in CPPS. Using penile Doppler ultrasonography, Gonen et al demonstrated that none of the men with CPPS and ED showed evidence of vascular deficiency that would interfere with erectile ability [33]. Although neurological and hormonal causes were not totally ruled out, investigators concluded that psychogenic causes, mainly depression, were the main reasons for the development of ED [33].

PE is a common male sexual dysfunction, affecting 30%-40% of sexually active men [35]. The term PE is subject to several definitions in accordance with approaches. According to the definition set up by the International Society for Sexual Medicine, "PE is a male sexual dysfunction characterized by ejaculation which always or nearly always occurs prior to or within about one minute of vaginal penetration, and inability to delay ejaculation on all or nearly all vaginal penetrations" [36]. PE is another common sexual dysfunction associated with CPPS. Similar to findings in ED, the reported prevalence of PE varies widely, ranging from 26.2% [15] to 77.3% [33] in CPPS patients. Unlike ED, the prevalence of PE does not increase with age [15]. Although a clear link exists between the severity of CPPS and ED, published studies have produced inconsistent results about the relationship between the severity of CPPS and PE. An intravaginal ejaculation latency time (IELT) within 2 minutes was a standard cutoff point in the past. With this cutoff point, some studies have found a positive association between more severe CPPS symptoms and PE [14,15], while others have not [33].

CPPS and PE are highly comorbid, and the prevalence of CPPS in men with PE has been examined. Shamloul et al conducted a study

with 153 men with PE and 100 healthy men. They found 64% of PE patients had prostatic inflammation and 52% had chronic bacterial prostatitis [16]. In their study, CPPS was defined either by pain and urinary symptoms, or by organic pathology of the prostate, such as infection or inflammation.

Although pain with ejaculation is often a criterion for CPPS, the impact of ejaculation pain on quality of life or symptom scores has seldom been investigated. A previous study showed patients with CPPS and persistent ejaculatory pain had more severe CPPS symptoms, were less likely to show improvement with time, and had differences in demographic and quality of life data and sexual history compared with other patients with CPPS [37]. However, we also noted that ejaculation could relieve pelvic pain in a small number of men with CPPS [38].

Sexual dysfunction heightens anger, frustration, and depression, all of which places a strain on a partner's relationship. The female partners of men with sexual dysfunction and depression often present with similar symptoms, including pain upon intercourse, vaginismus, and depressive symptoms. Despite expectations that CPPS would be detrimental, Smith et al found men with CPPS did not report significantly decreased sexual satisfaction or relationships compared with controls [39]. In addition, Aubin et al found that men appeared open to the initiation of sex with partners, were receptive to partners, and assumed their partners were sexually satisfied [30]. However, further research is needed to investigate why these men with CPPS appear to be functioning much better than expected in their relationships, despite persistent chronic pain.

## MANAGEMENT OF SEXUAL DYSFUNCTION IN MEN WITH CHRONIC PELVIC PAIN

The hypothesis of hypertonic pelvic floor muscles has led to treatment of CPPS by releasing the trigger point. Trigger point release reduces pain, and may have positive effects on sexual dysfunction [25, 40]. After trigger point relaxation and paradoxical relaxation training, sexual symptoms on a pelvic pain symptom survey (PPSS) improved an average of 77% to 87% in responders [25]. Overall, global responses of marked and moderate improvement were reported by 70% of patients who had significant decreases of 9 (35%) and 7 points (26%) on the NIH-CPSI ( $P < 0.001$ ), respectively [25]. PPSS sexual scores improved 43% with a markedly improved global response assessment ( $P < 0.001$ ) [25]. However, in that study, ejaculatory pain was considered a sexual dysfunction, unlike most other studies where it was characterized as a pain symptom. Therefore, the observed improvement in sexual dysfunction may be inflated by actual improvement in pain.

Pelvic floor exercise is also effective for the treatment of ED in the general population. Dorey et al showed a better response in an intervention group who had 3 months of pelvic floor exercise than a control group [41]. After 6 months of exercise, 40% of men had regained normal erection function, and 35.5% improved [41]. In addition, pelvic floor biofeedback has been studied and found effective in the treatment of men with CPPS [42,43]. Physical therapy including pelvic floor biofeedback and manual trigger point relaxation should be considered in the treatment of men with CPPS and sexual dysfunction.

PE associated with CPPS is hypothesized to be caused by infection or inflammation of the prostate [16], thus treatment with antimicrobial agents should reduce PE symptoms. Antibiotic treatment has been shown to significantly increase patients' IELT [44,45]. Despite these

improvements, the mean IELT was still very low. It is questionable whether the above-mentioned clinical improvement is significant [44]. Before these promising results can be recommended, further studies with placebo control or randomized assignment are mandatory.

## CONCLUSION

CPPS patients have a high prevalence of ED, PE and ejaculation pain. Pelvic floor hypertonus is considered an underlying pathology in sexual dysfunction, specifically sexual pain disorders and CPPS. Both CPPS and sexual dysfunction in males impair overall quality of life and should be considered and treated together.

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