



The Role of Sleep in Pelvic Pain: Are We Missing Something

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Abstract

Chronic Pelvic Pain (CPP) is a debilitating condition, common in gynecologic and urologic practice. It is defined as pain lasting over 6 months in the pelvic region and it is estimated to affect about 15% of the general population [1]. It could be related to certain pathology or infection, such as: endometriosis, vulvodynia, prostatitis or it could be primary when is not otherwise explained.

As in other chronic pain conditions, psychological factors play a role in the genesis and maintenance of pelvic pain. Less is known about the role of sleep in these patients. Among the treatment for CPP, surgery could be an option. In this case the role of preoperative and perioperative sleep should be assessed, since it could have a role for the development of Chronic Postsurgical Pain (CPSP). Future studies should assess the role of sleep in pelvic pain in order to develop effective multidisciplinary treatments for its management.

Introduction

Chronic pelvic pain (CPP) is defined as noncyclic pain lasting over 6 months in the pelvic region and it is estimated to affect about 2.1-26.6% of women worldwide [2,3]. Although pelvic pain is associated with multiple illnesses in women (i.e. vulvodynia, dyspareunia, dysmenorrhea), it also affect men with a prevalence of 2.2-9.7%. Chronic prostatitis is considered the most common cause of pelvic pain in men [4]. CPP is actually an umbrella term which contains multiple pathologies of visceral or pelvic origin. Among these conditions endometriosis, vulvodynia, chronic prostatitis but also irritable bowel syndrome and intestinal cystitis are considered cause of pelvic pain [5].

Pelvic pain could be related to inflammation or damage to tissues, for example in the case of endometriosis, uterine adenomyosis or as a consequence of pregnancy and delivery. Otherwise, it could have a neuropathic origin and it is defined as "primary pelvic pain" when it is not explained by other pathology [6]. It is, for example, the case of primary dysmenorrhea [7]. However, in the majority of cases, CPP symptoms arise from interplay between physical processes, such as tissue inflammation, dysfunctions in the immune, endocrine or nervous systems and psychological factors. Depression, anxiety, pain catastrophizing and central sensitization have demonstrated to be strongly associated with pelvic pain severity. Women suffering from CPP are also more likely to report sexual or physical abuse and psychiatric comorbidities (e.g. PTSD, personality and mood disorders) which are recognized as a risk factors for pelvic pain [8,9]. CPP is often associated with negative emotional, cognitive, behavioural and sexual consequences. Moreover, it is often associated with infertility and loss of workdays. For these reasons, people suffering from CPP report higher rates of disability, poor health-related quality of life and increased healthcare and medication utilization. It is

clear that CPP is a complex condition and all these factors generate a vicious cycle that worse patient's symptomatology.

Among the factors associated with pain, sleep quality and sleep disturbances have demonstrated to play an important role in different chronic pain conditions, for example in the field of fibromyalgia [10,11] and in multiple sclerosis [12]. Notably, chronic pelvic pain often occurs in comorbidity with musk skeletal pain conditions, such as fibromyalgia or chronic fatigue. Sleep and pain seems to have a bidirectional association, with sleep worsening pain perception and pain affecting sleep quality [13]. Despite this, the role of sleep experience has been less investigated for pelvic pain.

The recent literature use the term "sleep disturbances" referred to a wide range of sleep problems that affect sleep quality, for example sleep latency, sleep duration, difficulty falling and staying asleep, and early awakenings. Sleep disturbances referred instead to clinical conditions, for example insomnia, that are included and defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM) [14] or in the International Classification of Diseases (ICD-11) [15].

In DSM-5, insomnia is defined as dissatisfaction with sleep quantity or quality and a difficult to initiating and maintaining sleep [14]. Insomnia is generally diagnosed through physiological instruments, for example polysomnography and actinography, while sleep disturbances are assessed through self-report instruments [16] and are considered as subjective variables. The most common and reliable instruments used to assess sleep quality, are the Pittsburgh Sleep Quality Index (PSQI), the Insomnia Severity Index (ISI), and the Epworth Sleepiness Scale (ESS) [17].

Recent Findings

One of the latest articles that examined the association of sleep with pelvic pain was carried in endometriosis patients. This research showed a bidirectional association between pains sleep and also fatigue which is common in patients with endometriosis [18]. Women with endometriosis seem to report a poor sleep quality, excessive daytime sleepiness and some degree of insomnia [19]. In these women, worse sleep is associated with worse quality of life.

Moreover, women with endometriosis are often concerned about infertility. About this, Goksu [20] reported that endometriosis patients with infertility problems have poor sleep quality and more depressive symptoms. This clarifies how the multiple variables involved in pelvic pain interact each other, worsening symptoms. Other studies confirmed the association between poor sleep quality, pelvic pain severity and poor quality of life [21-23]. Women suffer from endometriosis are also more

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likely to use medication to sleep compared to the general population. Maggiore et al., also found an association between sleep quality and the severity of dysmenorrhea and pelvic pain [19]. Poor sleep worse pelvic pain perception, but also represent a risk factor for its development. Reed showed that women with worse baseline sleep disturbances have a higher risk to develop vulvodynia [24]. Similarly, Marino, et al. [25] reported a higher risk for endometriosis in women working on night shift (Figure1).



Figure 1

For inertial cystitis, the role of sleep is evident, since this illness is characterized by nocturnal, pelvic pain and an urgency to urinate that disturb the sleep cycle [26]. Patients with inertial cystitis report poor sleep quality, short sleep duration and trouble sleeping because of their symptoms. Poor sleep quality impairs quality of life, and it is also associated with greater sexual dysfunction in these patients [27]. These results show that, as it happens for other chronic pain conditions, sleep is a risk factor for the development of pelvic pain. It seems that sleep enter in the vicious cycle mentioned above harming patients mental and physical quality of life.

In some cases, surgery for CPP is an option. This is frequent in women, in particular for endometriosis patients. Hysterectomy, surgical excision, ablation or laparoscopic surgery is the most common surgical techniques for these patients. Thus, people who undergo these treatments could develop post-surgical pain (CPSP). A recent review, point out that 34.4% of women surgically treated for endometriosis develop post-surgical pain, 28.7% develop recurrent pain and 14.8% reported adverse events after surgery [28]. Presurgical and perisurgical sleep have demonstrated to be associated with the onset of CPSP, in particular after orthopaedic surgery [29]. Unfortunately, the prevalence of studies assessing the role of preoperative and perioperative sleep on pelvic pain severity after surgery is limited. Goksu [20] showed that, after laparoscopic surgery in women with endometriosis, sleep quality and depression scores improves, and this is considered as a success of the intervention. Nevertheless, the sleep improvement could be due to the reduction of pain itself.

Conclusion and Future Direction

Different treatments options exist for CPP. These treatments range from pharmacological therapy to physiotherapy and pelvic

floor exercises, although current guidelines recommend adopting multidisciplinary interventions. These should also include some form of psychological support or psychotherapy, due to the complexity of CPP and the multiple domains that are impaired in these patients [5]. Moreover, it is recommended to tailor the interventions for single patient's needs.

Cognitive-Behavioural Therapy (CBT) is widely used for the treatment of patients with chronic pain conditions, from fibromyalgia to migraine. It is also recommended for CPP, since it acts on specific components of the vicious cycle mentioned above, for example: anxiety, depression and pain catastrophizing [9]. CBT has been employed for endometriosis [30], vestibulodynia [31] and chronic prostatitis [32], demonstrating to be effective in ameliorate pain, sexual and emotional functioning and overall well-being. Notably, these interventions resulted particule effective when combined with physical therapy. Third-wave cognitive-behavioural therapies are also gaining attention: a mindfulness-based intervention conducted by Brotto [33] results effective for provoked vestibulodynia. Mindfulness-based treatment was also effective in reducing pain and fatigue in women with endometriosis [34,35].

CBT is widely used also for the treatment of pain-related insomnia through education programs [36] and it is recommended as the best treatment option for insomnia by current guidelines [16]. Thus, the use of CBT could be helpful for treating CPP patient's symptomatology, included sleep disturbances. For dysmenorrhea, a recent exercise program combing yoga, stretching and kegel exercises showed significant improvements in sleep quality and pain severity. According to the authors, the exercise program reduced pain and, through the reduction of pain, also sleeps quality improved [7]. This result should inspire future researches to include sleep quality in their trials. Sleep disturbance and sleep quality seem to play an important role in chronic pain conditions. This is also true for CPP, although the heterogeneity of pathologies under this name make difficult to draw generalized conclusions.

Furthermore, studies in this field have often adopted a cross-sectional or a case-control design, so it is no possible to draw conclusions about the causality of this association. Equally, trials evaluating the efficacy of psychological therapy on sleep and pain are limited by the scarce methodological quality and the lack of control groups [37]. Future studies should focus on the longitudinal association between sleep and chronic pelvic pain, in order to clarify the role of sleep and then use it as a target for the interventions. Moreover, the role of sleep for CPSP in patients who undergo surgery for pelvic pain needs to be further examined.

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