Approaches to psychotherapy for chronic musculoskeletal pain

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The management of patients with chronic musculoskeletal pain is an important biomedical problem due to the prevalence of this pathology and its resistance to therapeutic interventions. Psychosocial factors play a significant role in the formation and maintenance of chronic pain. In this regard, psychotherapeutic assistance is very important in the management of patients with chronic pain within the framework of multidisciplinary treatment. This review discusses the main psychotherapeutic approaches that have been used for chronic musculoskeletal pain: cognitive behavioral therapy, mindfulness therapy, psychoanalysis, hypnosis. General information about the essence of the discussed methods and the evidence base for their use in chronic pain are presented. A significant effectiveness of cognitive-behavioral therapy and techniques based on mindfulness therapy has been demonstrated.

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Pain is one of the most common reasons for seeking medical help. Although pain has traditionally been regarded as a symptom of a disease, current evidence suggests that chronic (defined as existing for at least 6 months) pain becomes an independent disorder deserving special attention of health professionals [1]. In the International Classification of Diseases of the 11th revision (ICD-11), chronic pain is classified as a separate diagnostic category, divided into secondary (associated with any cause, such as cancer) and primary, which includes, among others, chronic musculoskeletal pain (CMP) [2].

Modern epidemiological data demonstrates widespread prevalence of chronic pain in the population. Approximately 20% of population in developed countries is affected, and in 8% pain symptoms reach the severity that significantly decreases the level of functioning and quality of life [3].

The most common form of chronic pain is nonspecific musculoskeletal pain. The proportion of CMP in the structure of long-term pain reaches 90% [4]. According to various estimates, the prevalence of CMP among patients is from 13% to 47% [5].

Pain in clinical practice is often a subjective phenomenon, which makes its objective diagnosis difficult. Additional difficulties arise due to the fact that character of pain is influenced by the previous specific experience of the patient. Pain cannot be objectively observed, quantitatively or qualitatively measured or evaluated, the main assessment methods of pain (visual analog scale or other tests) are based on the patient's self-report. In this regard, many specialists underestimate the importance of long-term persistent pain, and patients receive less specialized care. However, modern studies strongly suggest that chronic pain leads to objective changes in the functioning of the brain [6, 7]. In this regard, physicians should consider chronic pain as a separate target for therapeutic interventions, deserving multimodal and multidisciplinary care [8, 9].

Multidisciplinary work is particularly important since chronic pain is essentially a biopsychosocial phenomenon in which psychological factors play a significant role [10, 11]. In the case of musculoskeletal pain (CMP), psychological characteristics of patients and social stress are one of the main predictors of pain chronicity [12].

Psychotherapy is recommended for patients with chronic pain in order to increase coping strategies, or in other words, to teach coping techniques and to reduce emotional stress. The main aim of all psychotherapeutic approaches is to increase activity in the patient's daily life and to shift the focus from symptoms to regaining the ability to return to a socially active life. Psychotherapy also allows patients to perceive their condition more consciously, to find a connection between repressed intrapsychic conflicts, experiences and changes in their body.

It is the combined usage of different approaches in the treatment of CMP that is more likely to bring positive results in working with such patients. The choice of a psychotherapeutic approach is individual and should take into account the level of evidence, patient's characteristics, needs, attitudes, sociocultural status, and other factors [11].

Therefore, it is necessary to clarify the role and evidence base of different forms of psychotherapeutic interventions in CMP. This review focuses on systematic evaluation of different approaches to psychotherapeutic care of patients with CMP: cognitive behavioural, psychoanalytic, mindfulness-based and hypnosis.

Cognitive behavioural therapy

The role of cognitive mechanisms in the formation and persistence of CMP has been convincingly demonstrated in several studies [13]. Pain perception, pain-related attitudes and pain-response behaviours are now thought to play a decisive role in the

transformation of acute pain (which plays an adaptive role) into maladaptive chronic pain. A contribution to the formation of chronic pain has been demonstrated for a range of cognitive mechanisms – catastrophizing, intolerance of uncertainty, ruminative thinking, etc. [14, 15].

Within the cognitive-behavioral paradigm, catastrophizing refers to a tendency to irrationally "predict" negative developments, even in the presence of compelling evidence to the contrary. Catastrophizing was originally described in samples of patients with anxiety and depressive disorders, but has since been found in patients with chronic pain as well, including those without comorbid psychiatric conditions. If there is a strong tendency to catastrophize, the patient considers even minor pain stimulus as evidence of their own unwellness, and concludes that the pain will never go away (even if the pain is episodic, and past experience suggests that it will eventually get better). The consequence of this is selective attention and fixation on painful stimuli, as well as a rejection of rehabilitative measures and behavioural activation and a consequent resistance of pain to existing therapeutic approaches [16].

Another cognitive characteristic of patients suffering from chronic pain is intolerance of uncertainty. Similar to catastrophizing, uncertainty intolerance was initially described in samples of patients with anxiety and, to a lesser extent, depressive disorders, but an association has now been established with chronic pain as well [17]. In patients with chronic pain, ambiguity intolerance is expressed by constantly seeking as much information about pain as possible, which is manifested both in repeated and excessive examinations, or in self-examination of the body area that hurts (groping, assessment of responses to different stimuli, etc.) [15].

Ruminative thinking is persistent fixation on certain negative experiences and thoughts with a persistent tendency to think about them repeatedly. Current research has shown that ruminative thinking is often activated in the presence of various somatic symptoms, among which pain comes to the fore. Repeated thoughts about pain, its manifestations and prognosis lead to the patient's fixation on the existing symptomatology and contribute to its chronicity [18].

The cognitive mechanisms described above form a "vicious circle" in patients: the perceptual and information processing patterns increase sensitivity to painful stimuli, intensify self-compassion, and decrease the capacity for behavioral activation. The resulting chronicity of pain serves as a "proof" of correct information processing tendencies and triggers negative thoughts [19,20]. In general terms, the vicious circle can be represented as follows: automatic negative thoughts → negative emotions → pain → maladaptive behaviour → automatic negative thoughts [21].

In this regard, cognitive behavioural therapy (CBT) serves as a primary mode of psychotherapeutic correction in patients with chronic pain. The therapeutic process in CBT is based on the identification of the described above and some other cognitive distortions and their consistent correction, followed by behavioural changes (active participation in rehabilitation programs, physical therapy, etc.). CBT for chronic musculoskeletal pain is delivered both individually and in groups [22].

The effectiveness of CBT has been convincingly demonstrated in randomized clinical trials summarized in a Cochrane Collaboration meta-analysis. CBT has been shown to have a significant clinical effect with respect to both the intensity of CMP itself and associated factors such as quality of life, anxiety and depression [23].

In addition, several areas of psychotherapy have developed in recent decades that are actually modifications of classical CBT. These are acceptance and commitment therapy as well as dialectical behavioural therapy.

Acceptance and commitment therapy (ACT) is a modification of CBT. The key difference between these approaches is that in ACT the client learns to accept their symptoms as well as the emotions associated with the symptoms, as opposed to correcting them in classical CBT. Acknowledging pain, accepting it, and shifting the focus from the symptoms to the level of functioning reduces pain perception, de-catastrophizes it, and significantly increases behavioral activation.

Existing evidence supports high effectiveness of ACT for various forms of chronic pain. In particular, the meta-analysis by L. Hughes showed that ACT has a significant positive impact on the overall functioning and well-being of patients with CMP [24].

A recent study has shown that older people responded better to ACT for chronic pain, whereas younger people responded better to classical CBT [25].

Dialectical behavioral therapy is also a result of modification of classical CBT and was originally developed to correct the symptoms of borderline personality disorder. However, over the last decade, the techniques underlying dialectical therapy have been successfully applied to patients with chronic pain. The basic tenets of dialectical therapy are based on the formation of a "compromise" between classical CBT, involving active correction of beliefs and emotions, and acceptance and commitment therapy [26].

Data on the effectiveness of dialectical therapy in chronic pain are limited to some preliminary results, which appear to be promising [27].

Summarizing the evidence for CBT in chronic pain, it should be emphasized that CBT in its various modifications is the most studied form of psychotherapy in this field. A convincing evidence base makes it possible to recommend the use of CBT in the majority of patients with chronic pain. The use of CBT as part of a comprehensive rehabilitation program for patients with CMP is recommended in a number of reputable national and foreign clinical guidelines [4, 28].

However, the use of CBT for nonspecific CMP in domestic neurological practice is limited due to a number of factors, such as poor awareness of neurologists and other specialists working with chronic pain, as well as the lack of payment for CBT from the Compulsory Health Insurance Fund [11].

Mindfulness therapy

Mindfulness-based psychotherapeutic practices are a set of techniques for shifting attention to the present moment and surrounding reality without emotional evaluation. In fact, mindfulness practices are an adaptation of the modern psychotherapeutic principles of Eastern meditative practices. Current research suggests that mindfulness therapy can reduce anxiety and depression, reduce stress levels, and reduce burdensome bodily symptoms (including pain) by activating the brain's default mode network[1]

[1]A complex of brain structures that are activated when a person is not engaged in any purposeful activity.

[29]. Mindfulness therapy for CMP can be used either alone or in combination with CBT techniques.

There is now strong evidence to support the effectiveness of mindfulness practices for CMP. The available evidence has recently been summarized in a meta-analysis, which showed a reliable pain-relieving effect of mindfulness therapy [30]. The compelling evidence base places mindfulness therapy alongside CBT in its applicability to patients with CMP. This position is also reflected in a number of clinical guidelines [4, 31].

Psychoanalytic approaches

It is generally accepted that psychoanalytic approaches to psychotherapy suggest that various factors (traumatic memories, unacceptable emotions and desires) that are not fully consciously perceived influence the patient's behaviours and symptoms of illness. In the works of the classics of psychoanalysis, pain disorders, including chronic disorders, were discussed in a very limited way. Similarly, a large proportion of authors working within the psychoanalytic paradigm support the concept of dividing chronic pain into psychogenic and having organic causes which contradicts modern understanding of the biopsychosocial nature of CMP [32].

Psychodynamic understanding of chronic pain has progressed considerably since the second half of the twentieth century, and the accumulated research data suggests that at least some cases of chronic pain, including CMP, are a delayed reaction to traumatic events in the past. Significant progress in the psychodynamic understanding of chronic pain has been made by G. Engel [33] and his followers. In the papers discussed, chronic pain and its role in the mentality were viewed from several perspectives. First, chronic pain allows the patient to realize an unconscious urge to suffer (associated with guilt, self-loathing, or other reasons). Second, long-term persistent pain symptoms may function as a compensatory response to the real or imagined loss of a loved one. Finally, patients who experienced traumatic events in early childhood (parents who were seriously ill or abused alcohol; physical or emotional abuse) are more likely to develop chronic pain disorders [33]. It is generally agreed that 40–60% of women and about 20% of men with chronic pain have at least one severe episode of psychological or physical abuse in childhood or adolescence [34]. A noteworthy meta-analysis has also shown a two-way relationship between chronic pain and traumatic events: among the patients' population with chronic pain there is a greater number of individuals with a history of emotional trauma, and a significantly higher number of individuals with chronic pain experienced a traumatic episode in the past [35]. However, there is still a need for prospective studies with a good design to establish a true predictive value of traumatic events in relation to the development of chronic pain.

On the basis of the data presented, psychoanalytic approaches to CMP therapy should aim at establishing a symbolic role of persistent pain and reconsidering the traumatic experiences symbolised by this pain. The main organisational disadvantages of psychodynamic approaches are long duration of the therapy (at least one year is required in most situations), and the need for long-term specialist training, which, in fact, precludes the use of elements of psychodynamic approaches by physicians involved in pain medicine – neurologists, orthopaedists, rheumatologists, etc. As a result, attempts have been made in recent decades to develop modified approaches to chronic pain therapy that are more short-term, but no validated protocols have been published to date.

The evidence of the effectiveness of psychoanalytic approaches in chronic pain therapy is still limited. There are a lot of case descriptions or case series in the available literature, including those presenting impressive improvements in symptomatology in patients who are resistant to all other treatment options, but there are only two controlled studies of psychoanalytic therapy for CMP. Both studies have demonstrated the superiority of psychoanalysis over basic drug therapy or wait-listing for psychotherapy, but comparisons of its effectiveness with other therapies are lacking [36].

To summarise the evidence for psychoanalytic approaches, it is reasonable to conclude that they will be effective in at least some patients, particularly those with a history of severe traumatic episodes. Nevertheless, the long duration, high cost and low level of evidence generally preclude psychoanalysis from being considered as a first-line therapy for patients with chronic pain and it is not included in the current clinical guidelines.

Hypnosis

The technique of hypnotic suggestion is based on a combination of relaxation and arbitrary shifting of attention, both in terms of the surrounding reality and in terms of various sensations in the body. The use of hypnosis to reduce the intensity of pain has a long history and has been confirmed in several fundamental studies. In particular, using functional magnetic resonance imaging, researchers have shown that hypnotic suggestion is able to alter the activity of key areas of the cerebral cortex involved in pain perception (prefrontal cortex, cingulate cortex, insula, etc.) [37].

The effectiveness of hypnotherapy for CMP has been shown in a number of studies, summarized in a meta-analysis by T. Thompson et al. [38]. The team of authors confirmed the presence of a reliable analgesic effect of hypnosis (including in CMP), although it was highly dependent on the patient's suggestibility and sensitivity to hypnosis. Patients with low sensitivity to hypnosis reported little or no effect of hypnotherapy performed to reduce the severity of pain.

Over the last few decades, there has also been an increasing interest among researchers and clinicians in various techniques to improve the effectiveness of hypnotic suggestion. Two of the most promising directions are a combination of hypnosis with virtual reality glasses and biofeedback systems (biofeedback).

Some researchers believe that virtual reality glasses contribute to the induction of a hypnotic state by placing the patient in an immersive space, different from the familiar reality. The effectiveness of the combination of virtual reality and hypnosis in chronic pain is being intensively studied, but there is insufficient clinical evidence to draw an unequivocal conclusion about the effectiveness of this combination [39].

Biofeedback is a way of visualizing certain physiological parameters (pressure, pulse, muscle tension, electroencephalographic signals) and their conscious correction by the patient himself[2]. A number of researchers are currently attempting to

[2]Biofeedback therapy itself is not psychotherapy, and therefore its effectiveness in treating chronic pain is not discussed in this review.

combine training in biofeedback with recording the results of electroencephalography under hypnosis; the results are encouraging [40].

In general, the available evidence concerning hypnotherapy allows to regard it as a promising method of chronic pain management, although it should be kept in mind that maximum effect may only be expected from individuals with high sensitivity to hypnosis. However, due to the lack of evidence, hypnotherapy is not included in the current clinical guidelines for the treatment of CMP.

Conclusion

Psychological and social factors play a major role in the manifestation and persistence of CMP, and in many cases determine a suboptimal response to therapy. Various psychotherapeutic approaches seem to be promising in treating CMP, increasing the efficacy of the therapy. Currently, available forms of psychotherapeutic interventions (CBT and its modifications, mindfulness, psychoanalytic approaches, hypnotherapy etc.) provide resistant patients with individualized help that best meets their needs.

Awareness of current psychotherapeutic techniques among doctors specializing in the treatment of CMP will improve the quality of care and lead to a better prognosis for a significant number of patients. Thus, the inclusion of psychotherapists from different disciplines in a multidisciplinary team can fully address the psychosocial factors that play an important role in the chronicity of CMP.

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