



Perioperative use of medical hypnosis

Perioperativna uporaba medicinske hipnoze

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Abstract

Emotional stress during medical procedures causes a direct negative experience as well as possible negative consequences for patients. It can be reduced by pharmacological and non-pharmacological interventions. Hypnosis is a non-pharmacological intervention which reduces perioperative stress and pain. Hypnosedation is an anaesthetic technique that combines hypnosis with local and regional anaesthesia, procedural sedation and analgesia. It is associated with improved intraoperative comfort, reduced anxiety and pain, diminished intraoperative anxiolytics and analgesics requirements, optimised surgical conditions and enhanced recovery. It is appropriated just for certain surgical procedures and selected patients. Multimodal strategies should include pharmacological and non-pharmacological approaches, where medical hypnosis is used as an adjunct in perioperative setting.

Izvleček

Perioperativni čustveni stres je za bolnika slaba izkušnja, ki ima negativne posledice. Zmanjšamo ga lahko s farmakološkimi ali nefarmakološkimi metodami. Medicinska hipnoza je nefarmakološka metoda, ki zmanjša perioperativni stres in bolečino. Hipnosedacija je anestezijska tehnika, pri kateri se medicinska hipnoza uporablja kot dodatek k lokalni ali področni anesteziji ob sedaciji ali analgeziji. Izboljša udobje med posegom, zmanjša občutek tesnobe, bolečine, porabo anksiolitikov in analgetikov, izboljša pogoje za operacijo in skrajša čas okrevanja. Uporablja se le pri določenih kirurških posegih in pri izbranih bolnikih. Multimodalna strategija zdravljenja vključuje tako farmakološke kot nefarmakološke pristope. Medicinska hipnoza se lahko uporablja kot sredstvo, ki učinkovito dopolnjuje perioperativno zdravljenje.

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1 Introduction

The first documented use of medical hypnosis in surgery dates back to 1830 when Jules Cloquet and John Elliotson performed several surgical procedures under hypnosis and without the addition of anaesthetics (1,2). The introduction of chloroform, ether, and volatile anaesthetics pushed medical hypnosis into the

background, but it later began to be used again as a complementary method to general anaesthesia and sedation (3). Since 1992, it has been routinely used to supplement sedation and analgesia in procedures performed under local or regional anaesthesia (hypnosedation) (4-9). Emotional stress during procedures contributes to an unsatisfactory experience for patients and can be associated with other negative consequences (pain, nausea, fatigue, inability to perform, poor wound healing) (10,11). Medical hypnosis is a nonpharmacological method that reduces perioperative stress and has no known side effects (10-12). It can be a complementary method for treating perioperative stress as well as anxiety, pain, nausea, and fatigue. The beneficial effects reduce the inflammatory response, drug consumption and shorten recovery and hospital treatment times. Research suggests that medical hypnosis may also have a long-term effect on a more favourable prognosis of cancer outcome (13,14). Therapeutic communication using medical hypnosis has also shown a beneficial mental impact on awake brain surgery patients (14-17).

The purpose of this article is to present how useful medical hypnosis can be in the perioperative period.

2 Neurobiology of hypnosis

Medical hypnosis is a state of consciousness with focused attention, decreased external awareness, and increased suggestibility (18). Scientific research confirms that medical hypnosis is an effective way to relieve pain, anxiety, psychosomatic diseases, dissociative disorders and behavioural disorders, and is useful in medicine, psychology and nursing care (4,9,10,18).

Analysis of functional magnetic resonance imaging provides a better

understanding of the effects of medical hypnosis on the brain. The functional connection of three brain networks was studied: the executive control network, which involves focused attention and working memory (ECN), the salience network, which involves working memory, challenges, anxiety, emotions and will (SN), and the default mode network, which involves thinking and rest (DMN). The executive control network includes the bilateral dorsolateral prefrontal cortex (DLPFC) and its upper parietal part. It is involved in focused attention and working memory (19). The main network combines the dorsal anterior cingulate cortex (dACC), the frontoinsula cortex and the subcortical area, e.g. the hypothalamus. It is activated in the face of challenges or anxiety (19). The default mode network consists of several structures: the posterior cingulate cortex (PCC) and other brain structures in the mid-sagittal line, such as the medial prefrontal cortex (mPFC). It is activated by thinking and rest and deactivated by task planning (19). In highly suggestible subjects, decreased default mode network activity during medical hypnosis has been reported. This suggests that hypnosis is a state of consciousness different from sleep (20). Increased suggestibility is associated with higher concentrations of dopamine metabolites (homovanillic acid) in cerebrospinal fluid (21). Recently, Jiang and colleagues demonstrated that medical hypnosis reduces dACC activity and increases the functional association between DLPFC and insula in the salience network. It also reduces the connection between the executive control network and the default mode network (22). Medical hypnosis is characterized by the following changes in neural activity: focused attention, enhanced physical and emotional control, and decreased self-awareness (Figure 1).

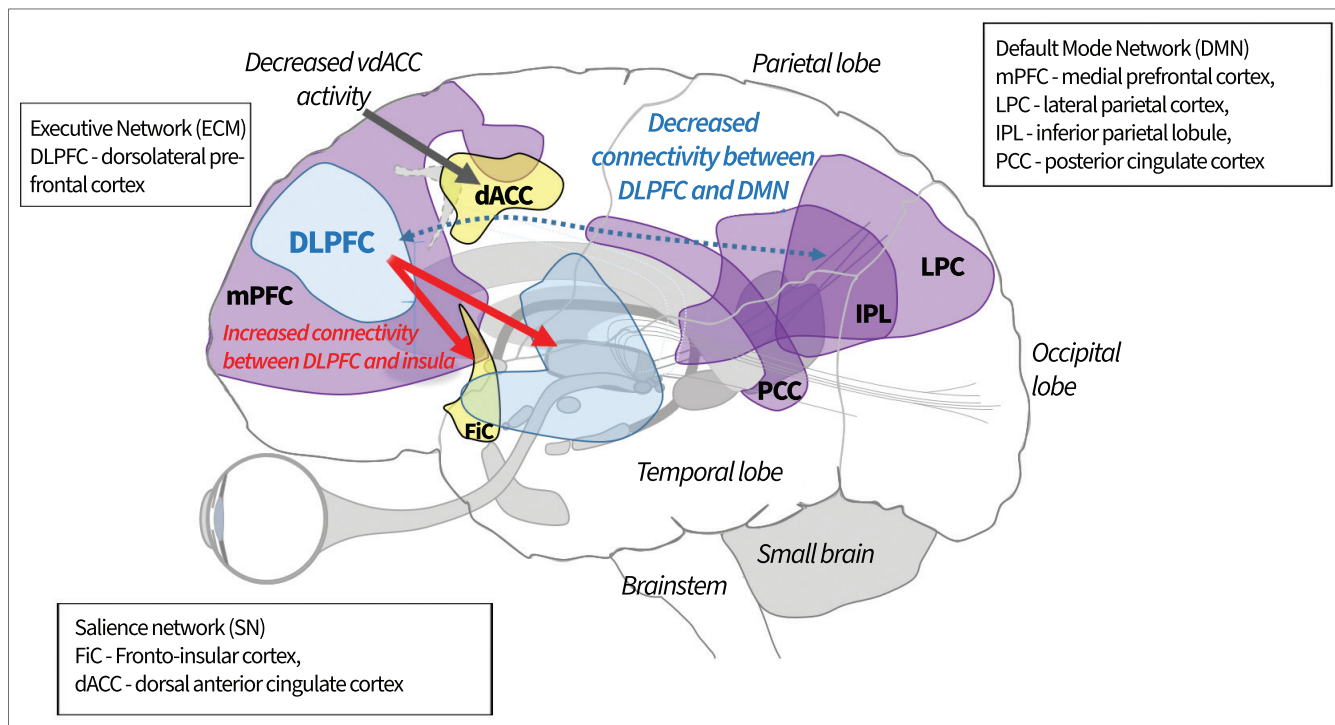


Figure 1: Functional connection of three brain networks during hypnosis. Figure is summarized from Jiang H, et al (22).

3 Perioperative use of hypnosis

In a meta-analysis, Teflikow and colleagues compared the effectiveness of perioperative hypnosis in three groups of adult patients: with standard care, with increased attention, or with medical hypnosis as a complementary method. Research has shown that medical hypnosis reduce perioperative stress, pain, drug consumption, parameters of vital functions, postoperative recovery time, and duration of surgery (11). More frequent and prolonged therapy sessions with medical hypnosis before surgery does not take precedence over single and short-term therapy (11). Other studies have found that perioperative use of medical hypnosis or positive suggestions contribute to faster wound healing, faster return of bowel function, and reduction of nausea (4,5,23). Moreover, medical hypnosis in children has also been shown to reduce

anxiety before and after surgery more effectively than midazolam (24).

Neuroradiological research has shown reduced activity of the extrinsic brain network involved in perceiving the environment and sensations during medical hypnosis. Hypnosis regulates the perception of pain in interconnected brain networks involved in the transmission and sensation of pain stimuli (8). Halsband and colleagues have shown that in patients with dental phobia, medical hypnosis is effective in reducing fear and the recollection of unpleasant memories (25).

In major operations, surgery and anaesthetic technique significantly affect the immune response. Cell-mediated immunity may increase the number of postoperative complications such as infections, poor wound healing, decreased cognitive abilities, and cancer progression (26,27). In cancer patients, volatile and intravenous anaesthetics have a clinically relevant

anti-inflammatory effect (28,29). In these patients, preoperative medical hypnosis effectively reduces emotional stress, nausea after surgery, pain, consumption of analgesics and their side effects, and the release of stress hormones. By reducing perioperative stress, the immune system is strengthened and tumour growth is slowed (2,9,13).

Adverse effects of general anaesthesia and deep sedation may result in haemodynamic instability, respiratory arrest, prolonged mechanical respiration, slowed bowel function, delayed early mobilization of patients, increased cognitive impairment, and prolonged hospital treatment (9). This can be avoided using nonpharmacological approaches to treatment, such as the perioperative use of medical hypnosis, which is inexpensive and without side effects (4-8,13). It is performed 1–5 days before the operation, when the patient's consent and trust are obtained. They are taught breathing techniques and how to visualize a safe and pleasant environment. The technique is based on reliving pleasant life experiences. Patients are positively motivated as they are invited to play an active part in the treatment process (7,30). The act of recalling positive suggestions is used before anaesthesia, which then further reduces anxiety and stress response before surgery. As a complementary method, medical hypnosis can be used with local anaesthesia or sedation, which is known as *hypnosedation*. During the operation, the feeling of discomfort, anxiety and pain is reduced, consumption of anxiolytics and analgesics during the procedure is reduced, conditions for the operation are improved, and recovery is accelerated (8,10,30). Medical hypnosis brings added value to established anaesthetic procedures but is only suitable for specific procedures and selected patients (7,13). It cannot be performed in deaf

patients and patients with psychosis (7).

A good hypnosedation performance requires close cooperation between the surgical and anaesthesia teams. The operating room needs to provide peace. The patient is conscious but has reduced external consciousness, so he or she is distanced from the procedure. The surgeon must work gently and precisely, and the anaesthesiologist must closely monitor the operation itself and the patient's needs (7,30).

Hypnosedation has become a routine technique in many branches of surgery, such as gynaecology, vascular surgery, plastic surgery, maxillofacial surgery, ophthalmology, oncology, orthopaedics, traumatology, dental surgery, and neurosurgery (4-8,13-17).

In Slovenia, the pioneer of medical hypnosis is prof. Marjan Pajntar, MD, PhD (31,32). In 1962, he began practising medical hypnosis in obstetrics (33). The first operation with medical hypnosis alone was performed in 2016 at the University Medical Centre Ljubljana by prof. Uroš Ahčan, MD, PhD. Matej Serdinšek, MD, also a medical hypnosis therapist, tested this method on himself, having the hypnosis performed by the medical hypnosis therapist Mitja Perat, director of the Institute for Human Resource Development (34). The positive effect of hypnosis is also shown in awake neurosurgery (15,35).

4 Conclusion

Although clinically beneficial effects of medical hypnosis have been proven, it is still not used routinely in the perioperative period. A multimodal treatment strategy with a combination of pharmacological and nonpharmacological methods could be used more frequently in the perioperative period. Careful

patient selection and close collaboration between the surgical and anaesthesia teams are important for the success of hypnosedation. Staff need to be trained in communication skills and non-pharmacological approaches.

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