## Antidepressant

Antidepressants are drugs used for the treatment of major depressive disorder and of other conditions, including some anxiety disorders, some chronic pain conditions, and to help manage some addictions. Common side-effects of antidepressants include dry mouth, weight gain, dizziness, headaches, and sexual dysfunction.

## **Tricyclic antidepressant**

## Tricyclic antidepressant

Antidepressant drugs can be advantageous in treating psychiatric and non-psychiatric illnesses, including spinal disorders. However, spine surgeons remain unfamiliar with the advantages and disadvantages of the use of antidepressant drugs as a part of the medical management of diseases of the spine. Our review article describes a systematic method using the PubMed/Medline database with a specific set of keywords to identify such benefits and drawbacks based on 17 original relevant articles published between January 2000 and February 2018; this provides the community of spine surgeons with available cumulative evidence contained within two tables illustrating both observational (10 studies; three cross-sectional, three case-control, and four cohort studies) and interventional (seven randomized clinical trials) studies. While tricyclic antidepressants (e.g., amitriptyline) and duloxetine can be effective in the treatment of neuropathic pain caused by root compression, venlafaxine may be more appropriate for patients with spinal cord injury presenting with depression and/or nociceptive pain. Despite the potential associated consequences of a prolonged hospital stay, higher cost, and controversial reports regarding the lowering of bone mineral density in the elderly, antidepressants may improve patient satisfaction and guality of life following surgery, and reduce postoperative pain and risk of delirium. The preoperative treatment of preexisting psychiatric diseases, such as anxiety and depression, can improve outcomes for patients with spinal cord injury-related disabilities; however, a preoperative platelet function assay is advocated prior to major spine surgical procedures to protect against significant intraoperative blood loss, as serotonergic antidepressants (e.g., selective serotonin reuptake inhibitors) and bupropion can increase the likelihood of bleeding intraoperatively due to drug-induced platelet dysfunction. This comprehensive review of this evolving topic can assist spine surgeons in better understanding the benefits and risks of antidepressant drugs to optimize outcomes and avoid potential hazards in a spine surgical setting <sup>1)</sup>.

Intermittent theta-burst stimulation (iTBS), a novel repetitive transcranial magnetic stimulation (rTMS) technique, appears to have antidepressant effects when applied over left dorsolateral prefrontal cortex (DLPFC). However, its underlying neurobiological mechanisms are unclear. Proton magnetic resonance spectroscopic imaging) provides in vivo measurements of cerebral metabolites altered in major depressive disorder (MDD) like N-acetyl-aspartate (NAA) and choline-containing compounds (Cho).

Zavorotnyy et al. used  $\ensuremath{\mathsf{MRS}}$  to analyze the effects of iTBS on the associations between the shifts in

the NAA and Cho levels during therapy and MDD improvement.

In-patients with unipolar MDD (N = 57), in addition to treatment as usual, were randomized to receive 20 iTBS or sham stimulations applied over left DLPFC over four weeks. Single-voxel Proton magnetic resonance spectroscopic imaging of the anterior cingulate cortex (ACC) was performed at baseline and follow-up. Increments of concentrations, as well as MDD improvement, were defined as endpoints. They tested a moderated mediation model of effects using the PROCESS macro (an observed variable ordinary least squares and logistic regression path analysis modeling tool) for SPSS.

Improvement of depressive symptoms was significantly associated with a decrease of the Cho/NAA ratio, mediated by NAA. iTBS had a significant moderating effect enhancing the relationship between NAA change and depression improvement.

These findings suggest a potential neurochemical pathway and mechanisms of antidepressant action of iTBS, which may moderate the improvement of metabolic markers of neuronal viability. iTBS might increase neuroplasticity, thus facilitating normalization of neural circuit function <sup>2)</sup>.

1)

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