Subgenual Cingulate Cortex

The subgenual anterior cingulate cortex (subgenual ACC) plays an important role in regulating emotion, and degeneration in this area correlates with depressed mood and anhedonia.

Despite converging basic scientific and clinical evidence of the link between chronic pain and depression, existing therapies do not often take advantage of this overlap.

Kashanian et al. provided a critical review of the literature that highlights the intersection in brain networks between chronic low back pain (CLBP) and depression and discuss findings from previous deep brain stimulation (DBS) studies for pain. Based on a multidimensional model of pain processing and the connectivity of the subgenual cingulate cortex (SCC) with areas that are implicated in both CLBP and depression, we propose a novel approach to the treatment of CLBP using DBS of the SCC.

Materials and methods: A narrative review with literature assessment.

Results: CLBP is associated with a shift away from somatosensory representation toward brain regions that mediate emotional processes. There is a high degree of overlap between these regions and those involved in depression, including the anterior cingulate cortex, medial prefrontal cortex, nucleus accumbens, and amygdala. Whereas targets sites from previous DBS trials for pain were not anatomically positioned to engage these areas and their associated networks, the SCC is structurally connected to all of these regions and as well as others involved in mediating sensory, cognitive, and affective processing in CLBP.

CLBP and depression share a common underlying brain network interconnected by the SCC. Current data and novel technology provide an optimal opportunity to develop clinically effective trials of SCC DBS for CLBP [1)].

1)
Kashanian A, Tsolaki E, Pouratian N, Bari AA. Deep Brain Stimulation of the Subgenual Cingulate Cortex for the Treatment of Chronic Low Back Pain. Neuromodulation. 2021 Apr 19. doi: 10.1111/ner.13388. Epub ahead of print. PMID: 33872423.