

Publication

Brain volume changes after long-term injectable opioid treatment: A longitudinal voxel-based morphometry study

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 4607774**Author(s)** Schmidt, André; Vogel, Marc; Baumgartner, Sophie; Wiesbeck, Gerhard A.; Lang, Undine; Borgwardt, Stefan; Walter, Marc**Author(s) at UniBasel** [Schmidt, André](#) ;**Year** 2021**Title** Brain volume changes after long-term injectable opioid treatment: A longitudinal voxel-based morphometry study**Journal** Addiction Biology**Volume** 26**Number** 4**Pages / Article-Number** e12970**Keywords** anticipation; binge; brain volume changes; long-term opioid treatment; voxel-based morphometry; withdrawal

Clinical research has demonstrated the efficacy of injectable opioid treatment for long-term, treatment-refractory opioid-dependent patients. It has been hypothesized that compulsive drug use is particularly associated with neuroplasticity changes in the networks corresponding to withdrawal/negative affect and preoccupation/anticipation rather than binge/intoxication. However, as yet, no study has investigated the effect of long-term opioid treatment on key regions within these networks. Magnetic resonance imaging (MRI) was used to assess brain volume changes during long-term (approximately 9 years) injectable opioid agonist treatment with diacetylmorphine (DAM) in 22 patients with opioid use disorder. Voxel-based morphometry was applied to detect volumetric changes within the networks of binge/intoxication (ventral/dorsal striatum, globus pallidus and thalamus), withdrawal/negative affect (amygdala and ventral striatum) and preoccupation/anticipation (hippocampus, orbitofrontal and anterior cingulate cortex). The relationships between significant volume changes and features of opioid use disorder were tested using Pearson correlation. Long-term opioid agonist treatment was associated with the enlargement of the right caudate nucleus, which was related to the duration of opioid use disorder. In contrast, reduced volume in the right amygdala, anterior cingulate cortex and orbitofrontal cortex were found that were related to opioid dose, onset of opioid consumption and state anxiety. These findings suggest that long-term opioid agonist treatment is related to structural changes in key brain regions underlying binge/intoxication, withdrawal/negative affect and preoccupation/anticipation, suggesting sustained interaction between these systems.

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