

Differences in Dopamine Function in Fibromyalgia

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Objective: Fibromyalgia (FM) is a debilitating pain disorder that affects 2% of the population. Many of the drugs prescribed to fibromyalgia sufferers are highly addictive, have limited clinical efficacy, and do not treat the cognitive symptoms of fibromyalgia. The neurobiological substrates of fibromyalgia are unknown, but there is evidence for involvement of altered dopaminergic transmission in pain disorders. Given that dopamine is essential for proper cognitive function, it is possible that fibromyalgia symptoms are partly mediated by abnormal dopaminergic functioning. However, the *in vivo* dopamine system in fibromyalgia patients has not been assessed. Thus, the objective of the current study was to ascertain how the dopamine system in fibromyalgia differs from healthy controls. **Methods:** [¹⁸F]-Fallypride (FAL) PET scanning was used to assess DA changes during a working memory task relative to a baseline task. Twelve patients with FM and twelve controls completed study procedures. Subjects received one FAL PET scan during a 2-back working-memory condition and one during a 0-back (attentional control) task. **Results:** Fibromyalgia subjects had higher baseline FAL binding potential (BP_{ND}) in the right amygdala and ventral pallidum relative to controls. FM subjects had lower baseline FAL BP_{ND} in frontal, temporal, and cingulate cortices. Voxel-wise paired *t*-tests were used to infer increases or decreases in FAL BP_{ND} (indicative of decreases or increases in dopamine, respectively) during 2-back performance. Fibromyalgia subjects had significant dopamine release in the ACC, left insula, OFC, and bilateral hippocampus during the 2-back task. Conversely, decreases in DA were detected in the posterior parietal cortex and vmPFC. In controls, dopamine appeared to decrease in the posterior parietal lobe, left hippocampus, and vmPFC during the 2-back task. No significant DA release was detected in controls. Self-reported pain ratings in fibromyalgia subjects were significantly associated with baseline FAL BP_{ND} in the ACC, bilateral ventral pallidum, amygdalae, and PAG. **Conclusion:** These data suggest that in fibromyalgia, abnormalities in dopamine function may be associated with both working memory and pain perception. Further studies are needed to further explore the potential associations between dopamine and cognitive performance and pain perception in FM.

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