ODOR DISCRIMINATION IMPAIRMENT IN 6-OHDA-LESIONED RATS: A TOOL FOR HYPOSMA RESEARCH IN PARKINSON'S DISEASE

E. Aguilar\(^1\), J. Mullol\(^2\), V. Clementi\(^3\), V. Perez\(^3\), C. Marin\(^1\)

\(^1\)Laboratori de Neurologia, Institut d'Investigacions Biomediques August Pi i Sunyer (IDIBAPS), \(^2\)Clinical and Experimental Respiratory Immunoallergy, Institut d'Investigacions Biomediques August Pi i Sunyer (IDIBAPS), \(^3\)Laboratori de Neuropsicologia, Institut de Recerca de l'Hospital de la Sta Creu i St Pau, Barcelona, Spain

Although the pathophysiology of olfactory dysfunction in Parkinson's disease (PD) is poorly understood, hyposmia is considered a valuable biomarker for PD. To validate an animal model to investigate hyposmia in parkinsonism, we assessed olfactory dysfunction in rats with unilateral lesion of the nigrostriatal pathway induced by 6-hydroxydopamine (6-OHDA).

Following a food-deprivation schedule, Sprague-Dawley rats discriminated between two simultaneously presented odors (cinnamon vs vanilla), one food-rewarded and other non-rewarded. Experiments consisted of 15 consecutive trials. Number of correct trials and time required to dig in the rewarded odor were recorded. Self-correction was recorded as incorrect. Rats were distributed in two groups receiving 6-OHDA (8 µg) or vehicle into the left medial forebrain bundle. Olfactory discrimination was assessed prior and 7 days after surgery.

No differences between both groups were observed before surgery neither in percentage of correct trials nor in time required to dig in the rewarded odor. 6-OHDA lesion decreased the percentage of correct trials (p< 0.01) and increased the self-corrected digs (p< 0.05). No significant differences were observed in the time required to achieve the rewarded odor.

An alteration in odor discrimination has been shown in hemiparkinsonian rats. The lack of differences in the time required to achieve the rewarded odor indicates that motor alterations are not involved in the olfactory disorder. These results suggest that the unilateral 6-OHDA-lesion rat model might be a useful tool to investigate the pathophysiological mechanisms of hyposmia in PD.