

Lesional differences in the medial forebrain bundle and striatum of 6-OHDA Parkinson's disease mice

Objective: 6-Hydroxydopamine (6-OHDA) is often used to model Parkinson's disease (PD) in animals, resulting in dopamine neuronal cell death. The medial forebrain bundle (MFB) and striatum (STR) are typical targets, but symptoms and pathological changes vary depending on the targeted site. We compared differences in motor symptoms in unilaterally 6-OHDA lesioned mice between MFB and STR. Methods: Wild-type mice (n=10) were allocated to the left MFB (n=5) and STR (n=5) groups, followed by 6-OHDA lesioning. Before and 2 and 4 weeks after lesioning, motor function was evaluated using the rotarod, cylinder, and methamphetamine rotation test. Results: One mouse in the STR group died 10 days after lesioning. Two weeks after 6-OHDA lesioning, motor symptoms were observed in both groups. In the rotarod test, the latency to fall was shortened from 238 ± 53.7 (mean \pm SD) to 223 ± 123.0 sec in the MFB group ($p=0.69$) and from 260 ± 84.1 to 135 ± 80.7 sec in the STR group ($p=0.02$). In the cylinder test, the mean percentage of wall touch with the affected side foreleg decreased from 52.7 ± 6.44 to $50.7 \pm 6.44\%$ in the MFB ($p=0.15$) group and from 51.9 ± 0.9 to $33.3 \pm 22.4\%$ in the STR group ($p=0.22$), although each result was not statistically significant. Considering the rotation test, two and three mice in the MFB and STR groups exhibited rotation behavior, respectively. Conclusion: 6-OHDA administration to MFB and STR could induce different degrees of PD symptoms. In addition, we plan to report the results of behavioral experiments for dopamine dysregulation syndrome-like symptoms and pathological analysis.