Study design, materials and methods

Experiment was carried out in 6-OHDA-lesioned rats, an animal model of Parkinson’s disease. Intervention by application of DAergic agents. To further clarify the mechanism by which DAergic modulation, focusing on the following points: 1) micturition reflex under physiological conditions and 2) pharmacological intervention by application of DAergic agents. To further clarify the mechanism by which DAergic modulation, experiment was carried out in 6-OHDA-lesioned rats, an animal model of Parkinson’s disease.

Interpretation of results

GABA levels were not decreased but increased in 6-OHDA-lesioned rats (Fig. 3, 4).

Rats (6-OHDA: 2.53±0.36 min, sham: 4.23±0.33 min; p<0.05). Glutamate levels were also increased by micturition, parameters (data not shown).

MVP (43.1±5.1 cm water) compared with controls (ICI: 4.78±0.65, MVP: 25.8±3.6) (Fig. 2). Neither D2 antagonist was observed that PAG GABA was not decreased but increased by micturition in 6-OHDA-lesioned rats. These findings suggest that at least in the PAG, reduction in GABAergic tone underlying DAergic modulation may participate in lower urinary tract dysfunction observed in Parkinson’s disease, which is characterized by nigrostriatal DA depletion. It leads us to suppose that the PAG DA neuronal system plays a significant role in mediating micturition reflex, however few studies have addressed about its detailed mechanisms. Here in, we neurochemically investigated the functional role of DAergic control, in turn, GABAergic mechanism mediated via D1 receptor might be responsible for the micturition reflex. This hypothesis was supported by the finding that depletion of DA facilitates the micturition reflex. Furthermore, we observed that PAG GABA was not decreased but increased by micturition in 6-OHDA-lesioned rats. These findings suggest that at least in the PAG, reduction in GABAergic tone underlying DAergic modulation may participate in lower urinary tract dysfunction in Parkinson’s disease.

Concluding message

The present study suggests that GABAergic mechanism mediated via D1 receptors in the rat PAG contributes to micturition reflex. The bladder dysfunction of Parkinson’s disease could be attributed to the derangement of this regulatory mechanism.

References

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