Effect of traditional Japanese medicine, ninjin'yoeito, on cerebral blood flow in urethane-anesthetized mice

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[Background & Aim] Maintenance of adequate cerebral blood flow (CBF) is important for preventing cognitive dysfunctions. Ninjin'yoeito (NYT) reportedly mitigated cognitive dysfunction. The present study aimed to examine the effect of NYT on CBF.

[Methods] Male C57BL/6J mice (7-8 months old) were anesthetized with urethane and artificially ventilated. CBF was measured with laser-speckle contrast imaging. Arterial pressure was recorded from a femoral artery. NYT solution (0.25, 0.5, 1 g/kg) or vehicle (distilled water; DW) was intragastrically administered over 5 min via an implanted catheter. To induce CBF response to somatic stimulus, 30 sec of brushing stimulation was applied to the left hindpaw before and after NYT (1 g/kg) or DW administration. The order of solution was randomized.

[Results] The resting CBF decreased between 20 min and 50 min after DW administration ended. In contrast, CBF did not change after NYT administration. CBF obtained during the entire 70-min recording differed between DW and NYT (1 g/kg), but not the other doses of NYT. Arterial pressure was not affected by NYT or DW. Based on this result, brushing stimulation was applied within 20 min after administration. Brushing stimulation increased CBF, particularly in the right parietal cortex. CBF during stimulation after NYT (1 g/kg) was higher than that before administration, whereas DW did not affect CBF during stimulation.

[Conclusions] The present study suggests NYT has effects to prevent from CBF decrease after intragastric administration and to enhance CBF response to somatic stimuli.