Ginkgo biloba extract improves working memory performance in middle-aged women: role of asymmetry of prefrontal cortex activity during a working memory task

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Abstract

In order to clarify the mechanism through which extract of Ginkgo biloba leaves (EGb) improves cognitive function, we examined the effects of EGb on cerebral blood oxygenation in the prefrontal cortex (PFC) and on performance during a working memory task, using near-infrared spectrometry (NIRS). First, we evaluated differences in behavioral performance of the Sternberg working memory test (ST) and in the activation pattern of the PFC during ST between 15 young and 19 middle-aged healthy women. Then, we examined the effect of EGb (120 mg/day for 6 weeks) on ST performance and PFC activation pattern in the middle-aged group. The middle-aged group exhibited a longer reaction time (RT) in ST than the young group and showed a different PFC activation pattern during ST, i.e., the middle-aged group showed bilateral activation while the young group showed right-dominant activation. In the middle-aged group, administration of EGb for 6 weeks shortened the RT of ST and changed the PFC activation pattern to right-dominant, like that in the young group. The results indicate the PFC plays a role in the physiological cognitive function-enhancing effect of EGb. EGb might improve working memory function in middle-aged individuals by counteracting the occurrence of aging-related hemispheric asymmetry reduction.