Blockade of cyclic AMP-dependent protein kinase does not prevent the reverse ocular dominance shift in kitten visual cortex
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Monocular deprivation (MD) during the critical period for the development of visual cortex causes a loss of binocular response of neurons and a shift to the open eye, a normal ocular dominance (OD) shift. However, when MD is combined with chronic inactivation of the visual cortex by muscimol, the OD distribution of the neurons shifts to the deprived eye (reverse OD shift). It has been reported that the normal OD shift is abolished by chronic infusion of the protein kinase A (PKA) inhibitor, 8-chloroadenosine-3',5'-cyclic monophosphorothioate, Rp-isomer (Rp-8-Cl-cAMPS) into kitten visual cortex (Beaver et al., 2001). In the present study, we investigated the effect of this inhibitor on the reverse OD shift. Combination of MD and muscimol infusion into the visual cortex of 6-week-old kittens caused a reverse OD shift which was comparable to that seen in previous studies (Reiter and Stryker, 1988; Hata and Stryker, 1994). However, a reverse ocular dominance shift was also seen with concurrent infusion of the PKA inhibitor with muscimol. In laminar analysis, the strongest OD shift was observed in layer IV regardless of the presence or absence of the PKA inhibitor. This suggests that the dissociation of pre- and postsynaptic activities, which occurs mainly at thalamocortical synapses, induces the reverse OD shift, and that inhibition of PKA does not prevent it. We conclude that 1) PKA is not involved in the induction of the reverse OD shift; and 2) the intracellular signaling mechanism underlying MD-induced OD plasticity differs between normal and reverse OD shifts.

Changes in the activity-level of the cerebral cortex—the function of concentration maintenance (TAF) and influence of the exercise in the elderly
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Purpose: The purpose of this study was to clarify the effect of long-time exercise on the function of concentration maintenance (target aiming function:TAF) as indicators of activity-level of the cerebral cortex an on the influence to Profile of Mood States in the healthy elderly. Methods: Forty six subjects were divided into three groups, as long-time exercise group (LE-G): 21 subjects (66 age of years), exercise group (E-G): 12 subjects (69 age of years) and non-exercise group (NE-G): 13 subjects (70 age of years). Subjects were measured Profile of Mood States (POMS)test, 8-OHdG, Acrolein in urinary secretion as indicators of oxidative stress, and adrenaline, nor-adrenaline, dopamine in urinary secretion. Results: As the results, Mean TAF-L values as indicators on the function of concentration maintenance were significantly higher in LE-G, E-G (p<0.0001) than NE-G. And mean TAF-D values as indicators on tremble levels were significantly lower in same exercise group than NE-G. TMD as the total scores in the POMS test and scores of "Confusion" factors in LE-G and E-G were significantly lower than that of NE-G (p<0.05). However, 8-OHdG, ACR, adrenaline, nor-adrenaline and dopamine were no significant difference in three groups. Discussion: These results suggest the effect of exercise in the healthy elderly can increase the function of concentration maintenance in cerebral cortex activities and the Profile of Mood States.

Key words: advanced age, function of concentration maintenance (target aiming function:TAF), Profile of Mood States, exercise