



Enhancement of learning capacity and cholinergic synaptic function by carnitine in aging rats.

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The effects of a carnitine derivative, acetyl-L-carnitine (ALCAR), on the cognitive and cholinergic activities of aging rats were examined. Rats were given ALCAR (100 mg/kg) per os for 3 months and were subjected to the Hebb-Williams tasks and a new maze task, AKON-1, to assess their learning capacity. The learning capacity of the ALCAR-treated group was superior to that of the control. Cholinergic activities were determined with synaptosomes isolated from the cortices. The high-affinity choline uptake by synaptosomes, acetylcholine synthesis in synaptosomes, and acetylcholine release from synaptosomes on membrane depolarization were all enhanced in the ALCAR group. This study indicates that chronic administration of ALCAR increases cholinergic synaptic transmission and consequently enhances learning capacity as a cognitive function in aging rats. Copyright 2001 Wiley-Liss, Inc.

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