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Human/Clinical

DECREASED PAIN INHIBITION PROCESSES ARE RELATED TO DECREASED COGNITIVE INHIBITION IN OLDER ADULTS

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The aim of the present study was to examine the relation between decreased efficacy of pain inhibition mechanisms and the decline of cognitive inhibition in older adults. It was hypothesized that the age-related decrease in efficacy of pain inhibition mechanisms would be associated with the decline in cognitive inhibition, reflecting a general decrease of inhibitory functions with aging. Two groups of participants were recruited: 21 young adults (28,8 ± 9,1 y), and 23 older adults (62,9 ± 5,4 y). The experimental session included the assessment of nociceptive flexion reflex (RIII-reflex) threshold using transcutaneous electrical stimulation of the sural nerve, assessment of pain inhibition mechanisms using a heterotopic noxious counter-stimulation paradigm (HNCS) and assessment of cognitive inhibition using a computerized modified Stroop test. HNCS analgesia was abolished in older adults in comparison to young adults who showed significant pain inhibition during HNCS ($p < 0.001$). Similar effects were observed for RIII-reflex inhibition ($p = 0.03$), although RIII-reflex amplitude did not recover after HNCS. In addition, age was associated with decreased HNCS analgesia ($r = -.42$, $p = .004$), decreased RIII-reflex inhibition during HNCS ($r = -.37$, $p = .014$), and decreased cognitive inhibition (stronger Stroop effect) ($r = 0.41$, $p = 0.005$). Moreover, the decline of cognitive inhibition was related to RIII-reflex inhibition during HNCS ($r = - 0.33$, $p = 0.025$), and this relation failed to reach significance after controlling for age ($r= -.219$, $p = .15$). Together, these results confirm that normal aging is associated with a decline of both pain inhibition mechanisms and cognitive inhibition. Interestingly, decreased descending pain inhibition was associated with the decline in cognitive inhibition, suggesting that aging may induce a generalized decline of inhibitory functions. This warrants future studies to assess whether the overall decline of inhibitory functions reflects decreased efficiency of prefrontal inhibitory systems.