

Meditation-related increases in GABA(B) modulated cortical inhibition.

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Recent reports suggest meditation practice improves attentional performance and emotional regulation. The process of meditation apparently increases activation in the prefrontal cortex (PFC) and stimulates the reticular nucleus of the thalamus, implicating the production and delivery of the inhibitory neurotransmitter gamma-aminobutyric acid (GABA). GABAergic inhibitory interneurons have a central role in cortical inhibition (CI), modulating cortical excitability and neural plasticity. Changes in CI, after completion of a single meditation session, were investigated and compared to a non-meditating control activity. Transcranial magnetic stimulation (TMS), a non-invasive method of examining CI, was used to evaluate changes before and after a 60 min meditation session. Seventy right-handed healthy subjects (n = 35 meditators, n = 35 non-meditators) were assessed using TMS related measures of cortical silent period (CSP) and short intra cortical inhibition (SICI), with stimulation of the motor cortex coordinated with EMG recording of peripheral hand muscles. For the meditators, CSP and SICI were measured before and after meditation sessions while age-sex matched healthy control subjects were identically assessed after a non-meditating activity (television watching). The meditators showed a statistically significant increase in CSP after meditation compared to non-meditators after an equivalent period of television watching (P = 0.02) while no significant between-group differences were observed in the SICI. These findings indicate meditation processes are linked to GABAergic cortical inhibition, a mechanism previously implicated in improved cognitive performance and enhanced emotional regulation.

Brain Stimul. 2012 Sep 7. pii: S1935-861X(12)00153-2. doi: 10.1016/j.brs.2012.08.005. Guglietti CL, Daskalakis ZJ, Radhu N, Fitzgerald PB, Ritvo P. York University, Department of Kinesiology and Health Science, Toronto, Ontario, Canada.

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