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Effects of slow-oscillating transcranial direct current stimulation (so-tDCS) on early memory consolidation

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There is increasing evidence that brief periods of quiet wakeful rest immediately after learning facilitate memory-consolidation. This consolidation has been assumed to be supported by neocortical-hippocampal interactions that are controlled by slow-oscillating (~ 0.75 Hz) cortical activity. We examined whether so-tDCS supports memory consolidation when applied during quiet wakeful rest immediately after learning. Sixty adults underwent a one-hour arithmetic training, followed by a 15-minutes consolidation phase (quiet wakeful rest), in which participants received either anodal so-tDCS (targeting the left dorsolateral prefrontal cortex) or sham stimulation. After a 5-minute working memory task, participants were tested on their arithmetic performance. The group receiving anodal so-tDCS during the consolidation phase solved the arithmetic problems with a higher accuracy compared to the sham group. These preliminary results indicate that so-tDCS could support early memory consolidation and, hence, learning.

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