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The Impacts of Yoga On Cortical Thickness, Neural Connectivity and Cognitive Function in Early Psychosis: Preliminary Results From a Randomized Controlled Clinical Trial

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Background: Impairments of attention and memory are evident in early psychosis, and often lead to severe, longstanding functional disability. Effective non-pharmacological interventions are needed due to the unsuccessful results of pharmacological interventions.

Aims: To determine whether yoga is effective for cognitive impairments, and the neural mechanism underlying these effects.

Methods: It was a randomized controlled study of 12-week of yoga and aerobic exercise (walking and cycling) intervention vs wait-list control for female early psychotic patients. Memory was measured with Hong Kong List Learning Test and Digit Span test, and attention was measured with Letter Cancellation test. Cognitive data analysis was based on the Intention-to-Treat method using a mixed-model analysis. Seed based functional connectivity was applied using posterior cingulate cortex (PCC) as seed with AFNI. Cortical thickness analyses were performed using FreeSurfer. Results from yoga and control groups were presented.

Results: A total of 140 women were recruited and randomized into three groups. 95 completed the study, and 115 were included for cognitive data analysis. For imaging data, 42 participants were used for cortical thickness analyses; and 60 were included for neural connectivity analyses. Yoga group demonstrated significant improvements in working memory, verbal acquisition and attention ($P=.01$). Cortical thickness increased in the postcentral gyrus ($P<.01$); connectivity between PCC and bilateral inferior parietal gyrus increased after yoga intervention ($P<.005$).

Conclusions: Yoga has been found to be effective for memory and attention in early psychotic patients. The increases of thickness and neural connectivity indicate the possible neural mechanisms underlying the improvements of cognition.