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Chronic effects of wild blueberry (poly)phenols on cognitive function in healthy older individuals: the BluFlow study

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Recent evidence suggest that polyphenols found in blueberries may have benefits for human health, particularly cognitive function. In this study, the effects of a wild blueberry treatment (WBB) made from freeze-dried blueberry powder containing 264 mg anthocyanins (equivalent to 178 g of fresh weight blueberries) versus a macronutrient and micronutrient matched placebo (0 mg anthocyanins), consumed daily for 12 weeks, was investigated. The study design was a double-blind, parallel RCT with a study population consisting of 61 healthy older adults aged between 65-80. Outcome measures included cognitive function, vascular function and cerebral blood flow. Blood and 24 h urine samples were also collected to analyse polyphenol metabolites in urinary and plasma samples to give us an insight into the compounds' bioavailability in the human body. Finally, faecal samples were taken and the BluFlow study aims to explore whether there may be any composition and quantity change of strains associated with improvements in cognitive health within the WBB group and/or control group.

Cognitive function was assessed at baseline and at 12 weeks post-intervention, using a battery consisting of 4 tasks measuring a range of cognitive functions. The tasks included Rey Auditory Verbal Learning Test (RAVLT) to measure immediate and delayed episodic memory, Corsi Block Tapping Task to measure visuospatial working memory, Serial subtraction tasks to measure working memory, and Switching Task to measure executive function. Additionally, transient mood was measured using the positive and Negative Affect Schedule (PANAS), a validated scale-rating mood questionnaire.

Linear Mixed modelling analysis with baseline performance as a covariate, revealed that accuracy scores for the switching task targeting executive function, significantly improved for the WBB group compared to placebo at 12 weeks ($F(1,90.12) = 5.13$, $p = 0.026$)). Additionally, immediate recall measure (AVLT) examining short-term recall memory revealed a significant improvement for the WBB compared to placebo at 12 weeks ($F(1,46) = 4.321$, $P = 0.043$)). No other significant effects were observed for any other cognitive measures for the blueberry group.

This data suggests that chronic wild blueberry intervention may improve executive functioning and episodic memory processes in older adults. This, coupled with improvements in vascular health, may give us an insight into the mechanism of action behind polyphenol's effect on cognition. However, further research is necessary in order to investigate WBB's effect on other cognitive domains.