

Exercise Rehabilitation

Exercise [rehabilitation](#) is a personally prescribed set of exercises that range from active movement through to strengthening exercises using therabands, body weight and resistance machines or free weights, dependent on the needs of the client condition & findings during assessment.

Wang et al. aimed to investigate the mechanisms underlying the beneficial effects of [exercise rehabilitation](#) (ER) and/or [astragaloside](#) (AST) in counteracting [amyloid-beta pathology](#). A β oligomers were microinjected into the bilateral ventricles to induce A β neuropathology in [rats](#). Neurobehavioral functions were evaluated. Cortical and hippocampal expressions of both BDNF/TrkB and cathepsin D were determined by the western blotting method. The rat primary cultured cortical neurons were incubated with BDNF and/or AST and ANA12 followed by exposure to aggregated A β for 24 h. In vivo results showed that ER and/or AST reversed neurobehavioral disorders, downregulation of cortical and hippocampal expression of both BDNF/TrkB and cathepsin D, neural pathology, A β accumulation, and altered microglial polarization caused by A β . In vitro studies also confirmed that topical application of BDNF and/or AST reversed the A β -induced cytotoxicity, apoptosis, mitochondrial distress, and synaptotoxicity and decreased expression of p-TrkB, p-Akt, p-GSK3 β , and β -catenin in rat cortical neurons. The beneficial effects of combined ER (or BDNF) and AST therapy in vivo and in vitro were superior to ER (or BDNF) or AST alone. Furthermore, we observed that any gains from ER (or BDNF) and/or AST could be significantly eliminated by ANA-12, a potent BDNF/TrkB antagonist. These results indicate that whereas ER (or BDNF) and/or AST attenuate A β pathology by reversing BDNF/TrkB signaling deficits and mitochondrial dysfunction, combining these two potentiates each other's therapeutic effects. In particular, AST can be an alternative therapy to replace ER ¹⁾.

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Wang YL, Chio CC, Kuo SC, Yeh CH, Ma JT, Liu WP, Lin MT, Lin KC, Chang CP. Exercise Rehabilitation and/or Astragaloside Attenuate Amyloid-beta Pathology by Reversing BDNF/TrkB Signaling Deficits and Mitochondrial Dysfunction. Mol Neurobiol. 2022 May;59(5):3091-3109. doi: 10.1007/s12035-022-02728-3. Epub 2022 Mar 9. Erratum in: Mol Neurobiol. 2022 May 3;; PMID: 35262870.

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