Curcumin's Anti-Inflammatory Properties and Its Implications on Preventing Cognitive Decline Associated with Alzheimer's Disease

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Abstract: This study aims to validate the anti-inflammatory activity of curcumin through its ability to inhibit protein denaturation and unravel its implications on delaying Alzheimer's disease progression and preventing cognitive impairment. Curcumin, a phytochemical derived from the rhizomatous plant C. longa, is known to have medicinal properties including anti-inflammatory effects. The compound also has potential in the prevention and treatment of Alzheimer's disease (AD), a common irreversible neurodegenerative illness characterized by protein misfolding and aggregation. This investigation delves into reinforcing this link in a new light by elucidating curcumin's ability to inhibit protein denaturation and its potential to prevent protein misfolding, which are caused by similar external factors of thermal and oxidative stresses. In the present in-vitro study, curcumin exhibited potent anti-inflammatory activity by demonstrating high rates of protein denaturation inhibition, even greater than a commonly prescribed NSAID, ibuprofen. Additional mechanisms of curcumin's action in AD and inflammation, such as modulation of tumor necrosis factors, cytokines, amyloid-β inhibition, are also reviewed.