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Ginkgo biloba extract and cognitive decline

In Kleijnen & Knipschild's comprehensive review [1] of studies of *Ginkgo biloba* extract (GbE), they recommend the use of the extract for cerebral insufficiency, but not dementia. However, it may be premature to reject the possible use of GbE in the early stages of dementia, especially of the Alzheimer type. Indeed, some of the studies listed by Kleijnen & Knipschild [1] included patients with various dementias (see also review [2]).

Traditionally, research in the dementia field has been focussed on the impairment of cognitive function and its reversal. The modern view has been looking towards the early detection of decreases in cognitive function, so that compounds can be developed to slow neuronal loss. In this way, function can be maintained in vulnerable brain tissues and cognitive decline halted. It would seem from the biochemical profile of GbE that it could act to prevent neuronal damage, via its antioxidant properties.

Accumulating evidence suggests that free radical oxidation reactions are part of the ageing process and are probably a major contributor to it, [3,4]. Large neurones with high metabolic activity, such as the cortical pyramidal cells, seem to be especially affected, because their high rate of oxygen use would lead to toxic superoxide radical formation. The free radical (e.g. hydroxyl radical) action can cause changes in DNA, causing defects in protein synthesis [5] and impaired

repair mechanisms [6]. Thus, these oxidative processes induce gradual cellular degeneration and damage [7].

GbE contains flavonoids which have been shown to be scavengers of superoxide anions [8]. GbE, itself, has demonstrated antioxidant properties protecting against hydroxyl anions and blocking the auto-oxidative process linked to lipoperoxide generation and membrane degeneration [9]. It inhibits the free radical actions on the retina [10], and, *in vitro*, it blocks lipid peroxidation in the hippocampus and cortex [11]—two of the sites of degeneration in dementia [12].

From this evidence, it seems clear that the use of GbE for cognitive decline in the elderly should be studied further. For too long, the view has been held that dementia is a progressive, irreversible disease. It is even possible that GbE may be useful for 'age-associated memory impairment' (AAMI), memory loss of two thirds below the average in people over 50 years of age, but who are not yet demented [13, 14].

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