

The role of gonadotropins and testosterone in dementia

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There is substantial biological plausibility for protective effects of testosterone on the brain. With age, bioavailable testosterone levels show a decline in most men and an older age is also a risk factor for Alzheimer's disease (AD). From this it could be hypothesized that low levels of testosterone are a risk factor for AD, which was substantiated in several observational studies. In the Oxford Project To Investigate Memory and Ageing (OPTIMA), low testosterone was also found to be an independent risk factor for post-mortem confirmed AD. Several studies additionally reported finding higher levels of gonadotropins in the older cases with AD. This suggests that low testosterone levels are not mere by-effects of brain degeneration and that the hypothalamic-pituitary-gonadal (HPG) axis is still intact. As gonadotropins in themselves may be neurotoxic, we review the evidence of the most potentially successful treatment strategies for AD, either those focused on raising testosterone levels or those inducing lower gonadotropin levels through chemical castration.

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