Effects of Biperiden and Rivastigmine on memory and visuospatial processes

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The central cholinergic system is implicated in memory function and its dysfunction, as expressed in Alzheimer's disease. Cholinergic functioning also modulates visuospatial processes. In the current study an anticholinergic drug, biperiden, was compared to a acetylcholine activity enhancing drug, rivastigmine, in healthy elderly subjects, in order to investigate the acute effects of both drugs on memory and visuospatial functions.
A double-blind, placebo-controlled, randomised, cross-over study was performed with 16 healthy, elderly volunteers (8 male, 8 female; mean age 66.1 sd 4.4 years). All subjects received biperiden (2 mg), rivastigmine (3 mg) and placebo with an interval of 7 days between each condition. Testing took place one hour after drug-intake (which was around T_{max} for both drugs). Subjects had to learn a list of 18 words and had to recognize 16 previously presented nonsense pictures. Visuospatial abilities were assessed by asking the subject to trace tangled lines. In addition the symbol digit substitution test (SDST), which is supposed to reflect components of visuospatial scanning, perceptual motor speed, speed of cognitive processing, and intermediate memory, was administered.
On tests of free recall and recognition of verbal stimuli, biperiden caused impairments, whereas rivastigmine did not result in an improvement. The visual recognition of pictures was not influenced by biperiden and, unexpectedly, was significantly impaired by rivastigmine. Visuospatial processes were not affected by biperiden and tended to be improved after rivastigmine intake. The most clear-cut effects were found on the SDST: a significant impairment was found for biperiden and a significant improvement for rivastigmine. Subsequent analyses suggest that the drugs might have affected the visuospatial scanning processes during SDST performance.
These results implicate acetylcholine as a modulator of memory and visuospatial abilities.
Biperiden appeared to impair processes involved in memory tasks, while rivastigmine seemed to improve visual scanning and visuospatial processes.

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