

The effects of scopolamine in elderly volunteers using the Cogtest battery

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Background: Cogtest (Cogtest plc, London) is a computerized neurocognitive test battery of 16 subtests currently being used in over 300 organizations across 16 countries. It is designed for use with a variety of clinical populations and in clinical trials. The platform allows for accurate recording of reaction time data, enhanced standardization relative to examiner administered tests and is easily adapted for implementation in functional neuroimaging environments. Its internet data capture and web reporting facilities makes it unique amongst current cognitive test providers. Additionally, its multiple parallel forms make it amenable to repeated testing sessions across time making it an excellent tool for clinical trials.

Methods: In order to verify the sensitivity of the Cogtest system to pharmaceutical interventions, we administered a single 0.3 mg subcutaneous dose of scopolamine to N=8 elderly study participants. Scopolamine has been routinely used to induce cognitive dysfunction in a bid to mimic the loss of acetylcholine transmission seen in patients with Alzheimer's disease. All participants were tested on a battery of three Cogtest assessments, a test of continuous performance, one of strategic rule learning and a word-learning task. Participants were assessed 1-hour prior to drug administration and then 0:45, 1:45, 3:45 and 7:5 hours after drug.

Results: Consistent with the known effects of scopolamine, a decline in performance was seen on each task 1.45 hours after drug administration. Also consistent with known effects, cognitive decline was most marked on the word memory task, with performance falling from a mean total trials score of 10.1 (SE 1.16) to 5.9 (SE 0.8). Also consistent with our knowledge of scopolamine's effects, performance at 7.5 hours was restored to baseline levels 9.9 (SE 1.2). This effect was found to be statistically significant when analyzed by ANOVA ($F=3.75$, $P=0.01$).

Conclusion: The results of this study reaffirm our understanding of the dementia-mimetic properties of scopolamine. The study also confirms the capacity of the Cogtest battery to detect scopolamine induced memory impairments in small groups of normal volunteers and its application in Alzheimer's Disease.

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