

**SEVERITY OF INSOMNIA AND DAYTIME SLEEPINESS CORRELATES WITH VERBAL EPISODIC MEMORY PERFORMANCE IN ELDERLY**RJEM Raymann<sup>1,2</sup>, R den Haan<sup>1</sup>, S Ootes<sup>1</sup>, E van Braak<sup>1</sup>, DJ Bierman<sup>3</sup>, JAJ Schmitt<sup>4</sup>, DF Swaab<sup>1,2,3</sup> & EJW van Someren<sup>1,2,5</sup><sup>1</sup>Netherlands Institute for Brain Research, Amsterdam; <sup>2</sup>Graduate School Neurosciences Amsterdam; <sup>3</sup>University of Amsterdam; <sup>4</sup>Maastricht University; <sup>5</sup>VU University Medical Center Amsterdam, The Netherlands

Cognitive performance tends to decline after one or more nights with experimentally induced sleep disruption. Studies on relationships between sleep efficiency and cognitive performance in insomnia patients have given equivocal results. Furthermore it has been shown that (episodic) memory performance decreases with age. The aim of this study is to compare verbal learning and retrieval performance of elderly insomnia patients and age matched controls and the relationship with subjective severity of insomnia and daytime sleepiness.

39 unmedicated patients (age 59.7± 6.0 (mean±standarddeviation), 8 males) with primary insomnia as evaluated by the Dutch Sleep Disorders Questionnaire (SDQ) and the Pittsburgh Sleep Quality Index (PSQI), (SDQ 3.4±0.5 PSQI 12.4±2.8) were compared to 14 age matched controls (age 62.2±8.6, 7 male, SDQ 1.5±0.4, PSQI 3.2±1.5). The subjects completed the Athens Insomnia Scale (AIS), the Epworth Sleepiness Scale (ESS), Buschke Selective Reminding Test (SRT) with a 20 minute delayed recall and a visual verbal learning task using unrelated word-pairs with an overnight recall (VPA).

Elderly insomniacs reported significant more complaints on all sleep-related scales but the ESS as compared to the elderly controls. In agreement with our expectations, within the group of well-sleeping elderly, daytime sleepiness was associated with impairment of the short-term memory performance on the VPA ( $r=-0.68$ ,  $p<0.05$ ) and SRT( $r=-0.51$ ,  $p<0.05$ ), Wordlist learning correlated positively with subjective sleep quality SRT( $r=-0.70$ ,  $p<0.05$ ) and overnight word-pair retention was negatively related to subjective severity of insomnia ( $r=-0.78$ ,  $p<0.01$ ). However, contrary to what we expected, performance on SRT word list learning was *better* for the elderly insomniacs than for the age-matched controls ( $t= 2.19$ ,  $p<0.05$ ), and both word list learning and retention correlated moderately *positive* with subjective sleep complaints and subjective severity of insomnia within in the insomniac group ( $r>0.26$  &  $r<0.42$ ,  $p<0.05$ ).

Thus, in healthy elderly verbal learning is negatively affected by the degree of daytime sleepiness and the verbal word-pair learning and overnight retention is impaired when subjective sleep is somewhat less than optimal. However, in elderly insomniacs verbal learning is not affected by the degree of daytime sleepiness and wordlist learning and short-term retention are actually enhanced with increased subjective severity of insomnia. This relatively spared (or even enhanced) cognitive performance seen in elderly insomnia patients might be related to an increased arousal level, which has been proposed as a mechanism involved in insomnia. We hypothesize that elderly may have arousal levels that are sub optimal for explicit learning and retrieval. Hyper arousal in insomniacs may thus in fact counteract their age-related sub optimal arousal level.

**VERBAL EPISODIC MEMORY IS RELATIVELY SPARED IN ELDERLY INSOMNIACS**

Keywords: memory, cognitive performance, insomnia, elderly

Research supported by: Braun, Cambridge Neurotechnology, Itamar Medical, Japan Foundation for Aging and Health, Medcare, Nature's choice, Royal Auping NIBR, NWO (projects SOW 014-90-001 and Vernieuwingsimpuls), RVVZ.