

Meta-Analysis on the Next-Morning Effects of Hypnotic Drugs on Short- and Long-Term Memory Functioning in Healthy Adults and Elderly

Verster JC^{1,2}, Peters LV¹, van de Loo AJAE¹, Bouwmeester NH¹, Tiplady B³, Alford C⁴, Roth T⁵

1. Division of Pharmacology, Utrecht University, Utrecht, The Netherlands, 2. Centre for Human Psychopharmacology, Swinburne University, Melbourne, Australia, 3. Northumbria University, Newcastle, U.K., 4. University of the West of England, Bristol, U.K.
5. Henry Ford Health System, Detroit, MI, U.S.A.

Background

Sleep medication taken at bedtime may negatively affect next-morning cognitive performance. The aim of these meta-analyses was to determine the effect of hypnotic drugs on next-day short- and long term memory functioning.

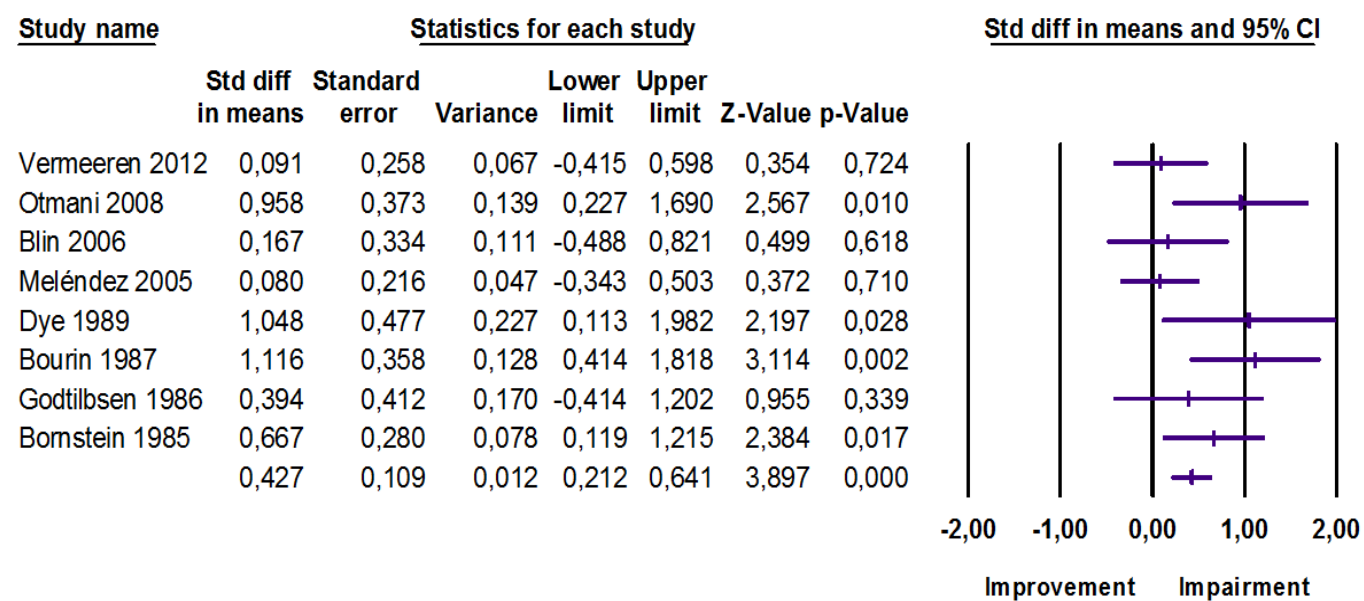
Methods

A literature search (Pubmed, Embase, PsycInfo, Scopus, Web of Science, and Cochrane) yielded N=33.969 potentially relevant articles. Studies were included if they assessed next-morning short- or long-term memory after bedtime administration of recommended dosages of hypnotic drugs, were double-blind, placebo-controlled, conducted in healthy volunteers, and sufficient data was reported. Separate analyses were performed for adults (18-65 years old) and elderly healthy volunteers (≥ 65 years old).

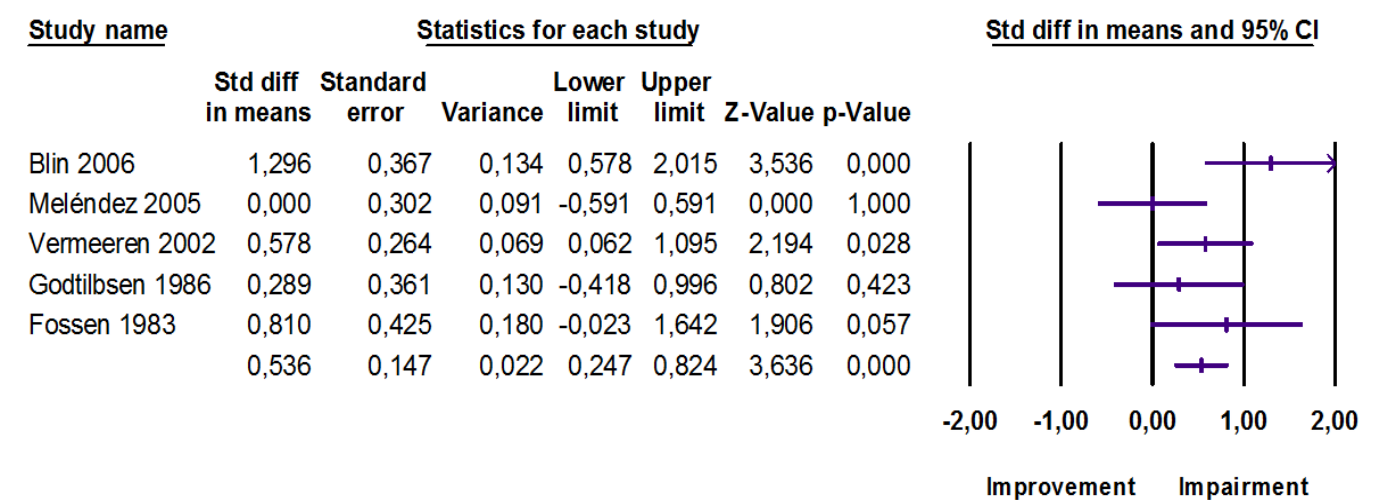
Results

In adults, eight studies assessing next-morning short-term memory (after bedtime administration of nitrazepam, triazolam, temazepam, flurazepam, melatonin, zaleplon, lormetazepam, zolpidem), and five studies assessing long-term memory (after bedtime administration of triazolam, nitrazepam, zopiclone, flurazepam, zolpidem) were included in the meta-analyses. The analyses revealed that both next-morning short-term memory (ES = 0.427, p=0.0001; 95%CI: 0.212 to 0.641) and long-term memory (ES = 0.536, p=0.0001; 95%CI: 0.247 to 0.824) were significantly impaired.

In elderly, three studies assessing next-morning short-term memory (after bedtime administration of flurazepam, zolpidem, temazepam), and three studies assessing long-term memory (after bedtime administration of flurazepam, zolpidem, temazepam) were included in the meta-analyses. The analyses revealed that in elderly next-morning short-term memory (ES = 0.412, p=0.019; 95%CI: 0.068 to 0.757) was significantly impaired. No significant impairment was found for long-term memory (ES = -0.038, p=0.825; 95%CI: -0.380 to 0.303).



Short term memory - effect of hypnotics in healthy subjects



Long term memory - effect of hypnotics in healthy subjects

Conclusion

Sleep medication, when administered in recommended dosages at bedtime, significantly impairs next-morning short- and long term memory functioning