

Effects of Sleep Surgery for OSA Patients on the Cognitive Function and Driving Skills Performance

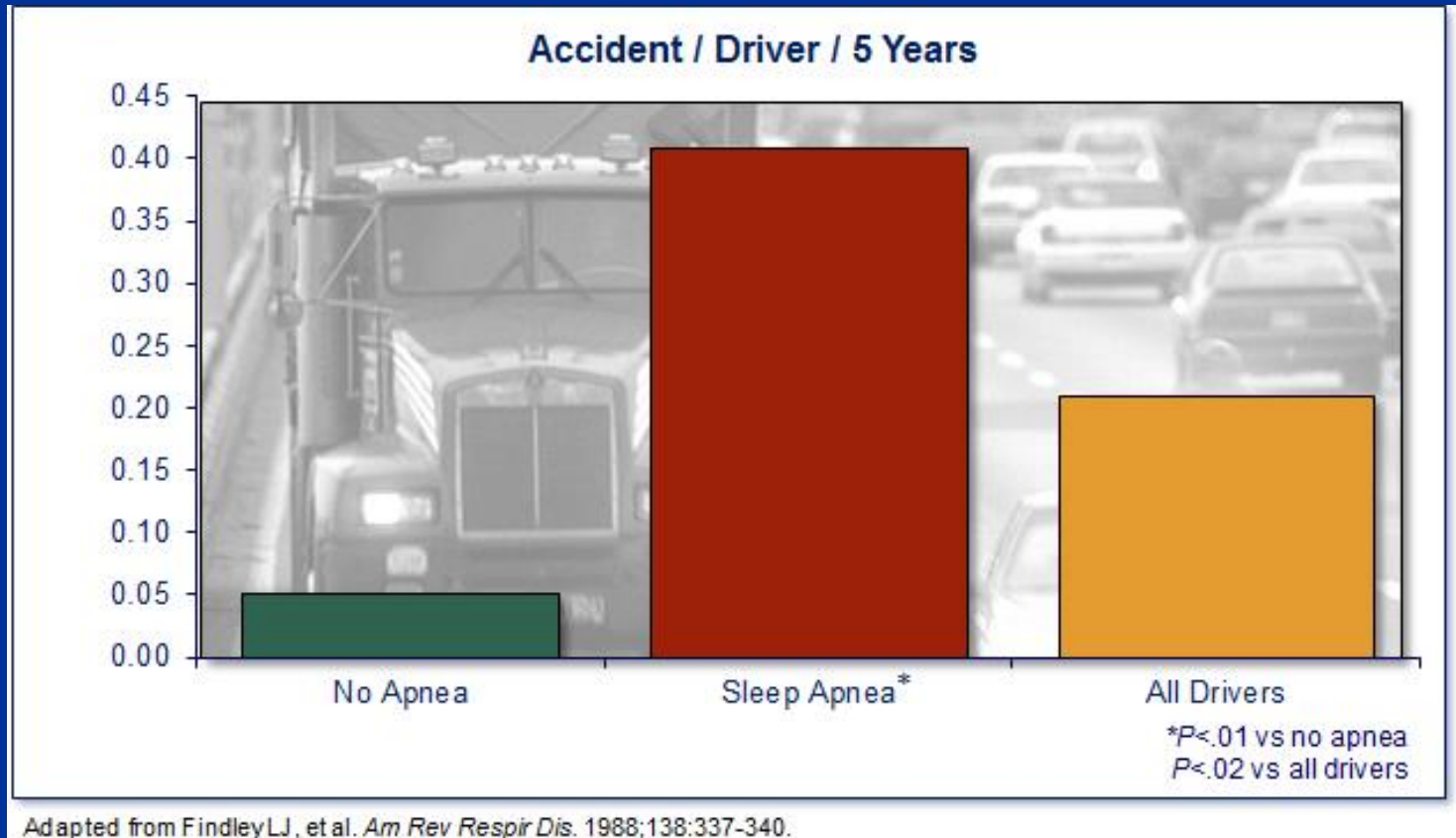
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Introduction

- OSA patients are at a significantly increased risk for a motor vehicle crash



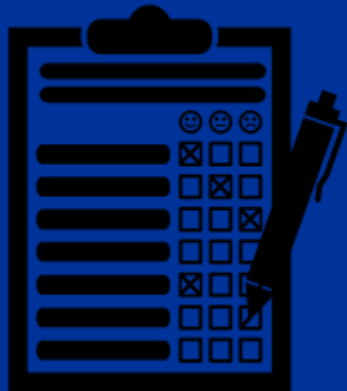
Introduction

- OSA patients are at a significantly increased risk for a motor vehicle crash
- OSA is also associated with cognitive impairment:
 - Attention deficits
 - Memory deficits
- Limited data on the effect of surgical therapy

To examine the effect of surgery for OSA on cognitive function and driving skills of those patients.

Patients and Methods

- Prospective study
- Preoperative assessment included an upper airway examination performed while the patient was awake, a polysomnography/polygraphy and a drug-induced sedation endoscopy (DISE)
- No other sleep co-morbidities



Methods- computerized tests

- STISIM driving simulator

Methods- computerized tests

- UFOV – Useful Field of View
- Subtest 1: Processing Speed
- Subtest 2: Divided Attention
- Subtest 3: Selective Attention

Methods- Questionnaires

- Manchester Driver Behavior Questionnaire
- Epworth sleepiness scale Questionnaire
- Trail making test (TMT) examines various cognitive skills by measuring time to complete the test

Results

- The study population included 56 patients, 48 males (85.7%) and 8 females (14.3%)
- The average age was 46.9 years
- 18 of the 56 study participants (32.1%) were involved in a car accident during the last 10 years
- One patient had a minor car crash 3 weeks after surgery

Results

Type of surgery	Number of patients
TORS (trans oral robotic surgery)	5
TORS +palate surgery	7
Base of tongue coblation+ palate surgery	13
Expansion sphincter pharyngoplasty	9
Modified UPPP/ Z-palatopharyngoplasty	5
Barbed Wire Reposition Palatopharyngoplasty	17

Results

- Epworth sleepiness scale: mean score significantly lower after surgery (13.7 ± 2.9 vs. 8.1 ± 1.3 , $P=0.043$).

Results

- AHI: mean score significantly lowered after surgery (28.5 ± 8.4 vs. 13.1 ± 3.7 , $P=0.034$).
- No correlation between ESS and better driving or cognitive results

Results

- Two-part TMT test: significantly shorter after surgery for both parts (median 21.4 sec versus 18.7 sec, and 46.8 and 40.5 before and after surgery respectively ($P= 0.039$)).
- Correlates to better AHI ($P= 0.042$)

Results

- Better UFOV after surgery:
- Processing Speed ($P=0.035$)
- Selective Attention ($P=0.054$)
- Correlates to better AHI ($P= 0.031$)
and lesser TB90% ($P= 0.051$)

Results

- Lower tendency to drive over the speed limit, or cross the dividing line to the opposite lane after surgery

Discussion

- severe OSA is associated with increased crash risk (Smolensky et al., 2011)
- 20% or more of commercial drivers have at least mild OSA (Pack et al., 2006; Berger et al., 2012)
- No other study

Limitations

- Small study sample
- Different surgeries
- Short follow up time

Conclusions

- Surgery is an effective way to treat well selected OSAs patients
- Surgery can improve cognitive and driving skills Of OSAS patients



Thank You

