Sleepiness, Napping and Health Risk in the Elderly

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Significance

- Daytime sleepiness and napping are common
- Predict adverse health outcomes and poorer function, physical and cognitive
- Cultural variations/norms difficult to take into account
- Relationships to nighttime sleep are complex
  - Napping and sleepiness studies do not always have complete data on sleep quality
Significance

- Sleepiness and napping tend to be studied separately – not necessarily related
- Reflection of poorer night-time sleep?
- What to recommend?
State-of-the-Art Knowledge

- Prevalence and incidence
  - Daytime Sleepiness
  - Napping
- Characteristics
- Outcomes – risks and benefits
- Interventions
Daytime sleepiness

- **Assessment**
  - Self-report, single item
  - Epworth daytime sleepiness scale
  - Sleep latency test

- **Prevalence**
  - 15-20%
  - Increase with age from 10 – 30 % age 65 to 85+
  - Men vs women – mixed results
Daytime sleepiness – risk factors

- Older age
- Sleep disordered breathing
- Poor self reported sleep quality
- Greater REM latency
- Pain
- Medications with sleepiness side effects
- Stroke, carotid disease
- Congestive heart failure
- Kidney disease - dialysis
- Obesity
- Poor self reported health
- Depression
- Functional limitations
- Elevated inflammatory markers

Outcomes

- **Function**
  - Social function
  - General productivity
  - Vigilance
  - Physical activity

- **Cognitive function and cognitive decline**

- **Cardiovascular events, especially congestive heart failure**

- **Mortality**

Daytime sleepiness and Total Mortality In the Cardiovascular Health Study

Figure 1. Mortality rates in men ($n = 2495$) and women ($n = 3393$) with and without daytime sleepiness.
Daytime Sleepiness – Higher risk in women with report of frequent awakening

Figure 2. Incident CHF in men (n = 2368) and women (n = 3260) with and without daytime sleepiness and frequent awakening.
Interventions

- **Targeting poor sleep**
  - Sleep hygiene and other primary sleep interventions

- **Targeting poor health**
  - Improving CHF, SDB, pain, dialysis

- **Targeting physical activity**
  - Physical activity (PSQI daytime function subscale)
  - Tai chi (Epworth Sleepiness Scale)

Napping

- **Assessment** - yes/no, frequency, duration, regularity
  - Self report
  - Actigraphy with diary
  - PSG

- **Prevalence**
  - Regular napping 10% age 55 to 25% age 75-84 (National Sleep Foundation Poll)
  - Little sex difference
  - Any napping – 54% ages 70-89 (LIFE Pilot), mean 55 minutes duration

Napping – characteristics of Nappers

- Greater comorbidity
- Higher BMI
- Retirement/unemployment
- Pain
- Nocturia
- Depression
- Memory complaints
- Excessive daytime sleepiness, short sleep, awakening at night or too early
- Not associated with insomnia, restless legs, sleep apnea or longer sleep
- Diabetes, obesity and lower 3MSE
- CAD, Cancer

Jung K-I Sleep Medicine 2013
Napping and sleep duration

- Nappers – longer or shorter nighttime sleep?
  - Some show similar nocturnal sleep time
  - Others show shorter nighttime sleep

- Distinguishing evening nap from falling asleep in front of the TV

- Not always associated with poor nighttime sleep (compensatory or elective?)

- Actigraphy
  - Sleep fragmentation associated with higher odds of napping, but not sleep duration

Outcomes

- **Mortality**
  - Napping > 30 min - 50 – 25 % higher risk W>M (Rancho Bernardo)
  - Daily napping in women – 35% higher risk, mostly CVD and other cause
  - Napping may mitigate the impact of short sleep on mortality risk

Jung K-I, et al, Sleep Medicine 2013  
Stone KL JAGS 2009  
Zhong G et al. Sleep Medicine 2015  
Interventions

- Napping as an intervention
  - Greater 24 hour total sleep
  - Enhanced cognitive performance
  - Lab study – greater total sleep, no effect on cognitive performance

Knowledge gaps

- Relationships between sleepiness, fatigue, tiredness, fatigability and napping?
  - We think of these as distinct syndromes
    - Fatigue more “peripheral,” physical symptom, not related to being sleepy. Tiredness used for both fatigue and sleepiness.
  - Need for more comprehensive understanding of relationship between night time sleep, daytime symptoms and impact on function

- Relationship between daytime and nighttime sleep
  - Better capture napping – is napping good for you? Does it mark underlying heart failure, cognitive decline?
Knowledge gaps

- Should napping be prescribed?
  - More work on effects of napping on nighttime sleep and daytime function
  - Currently, sleep hygiene recommendations oppose napping
- Complacency regarding sleepiness
  - Should sleepiness be “worked up” for underlying health conditions?
  - Often “taken for granted.” Normative?
Research Opportunities

- Standardization of assessment of sleepiness and napping
  - Frequency, duration, variability – methodologic development.
- Relationship to early cognitive decline
  - Marker of cerebrovascular disease?
  - Cause of executive cognitive functional impairment?
Research Opportunities

- Interventions
  - Interventions on daytime symptoms (most studies target nighttime sleep complaints with daytime function as outcome of interest)
  - Multidimensional interventions – behavioral, underlying illness, medication use, environment – primary care based?

- Interventions can probe mechanisms
  - e.g. alterations in rhythms, biomarkers
Thanks for staying awake!

QUESTIONS?