The Importance of Sleep in Development &
Developmental Disorder
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Introduction

In typical development:
- Memory functions are supported and extended in sleep
- Sleep integrates new vocabulary
- There exist specific, longitudinal links between a mature sleep state and executive functions

Sleep plays a crucial role in memory and learning in typically developing (TD) children

In atypical development:
- Individuals with Down syndrome (DS) show poor sleep and 70-80% exhibit obstructive sleep apnea syndrome (OSAS)
- Sleep disturbances are evident in DS in infancy, suggesting possible, early impacts on cognition

More work is needed to examine the relationship between sleep disturbance and cognition in individuals with DS across development

Aims

Study 1: To examine the role of poor sleep in neuropsychological outcomes in children and adolescents with DS

Study 2: To examine the relationship between sleep quality, behavior, and language in toddlers with DS

Study 1: Ages 7-12 years (Breslin et al., 2014)

Methods

Materials
- In home unattended ambulatory polysomnography (PSG) using the Compumedics Somté PSG system
- PSGs were manually scored by a certified PSG technician

Participants
- 38 children with DS ages 7-12 years, n = 31 sleep studies met quality criteria (61.3% had OSAS), similar on age, body mass index (BMI), and the presence of heart defects

Results

Sleep characteristics in relation to OSAS
- Individuals with OSAS spend more time in S1 and less in SWS than those with no OSAS

Cognition in DS in relation to OSAS
- Lower verbal IQ in those with OSAS (9 points)

Study 2: Ages 2-5 years (Edgin et al., 2015)

Results

Sleep characteristics in relation to language outcomes
- Lowest vocabulary production in poor sleepers with DS

Conclusions & Future Directions

- Deficits in sleep in DS seem to exacerbate poor executive functioning and delayed language skills across a range of ages
- Slow wave sleep is most affected by OSAS, a stage important for memory consolidation
- Currently, we are conducting a longitudinal sleep and cognitive study with infants 6 to 24 months of age
- Future work should focus on causal links underlying relationship between poor sleep and cognitive outcomes in DS and other developmental disabilities
- Early screening and treatment is highly recommended

References


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