Sleep Problems in the Child with Physical Disabilities
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Objectives

• Current evidence related to treatment/management of sleep problems in children with physical disabilities

• Role of medication

• Understand contributing factors

Types of Sleep Problems

• Insomnia

• Night Awakenings

• Parasomnias
  – Nightmares, night terrors, sleep walking, rhythmic movement disorder

• Phase shift

• Seizures
Pediatric Insomnia

Repeated difficulty with sleep initiation, duration, consolidation or quality that results in daytime functional impairment for the child and/or family.
(AA Sleep Medicine. The International Classification of Sleep Disorders 2005)

Prevalence:
6% general pediatric population
11% adolescents
50-75% in children with neurodevelopmental disorders

Sleep Problems in Children with Physical Disabilities

- Significant impact on child’s daily function
- Family stress/dysfunction
- Increased frequency
Why are Sleep Problems More Common?

- Can arise from primary dysfunction
- Delayed maturation of sleep-wake regulatory system
- Altered sleep organization
- Circadian Rhythm Disturbance
  - Greater if children do not visually track
  - Decreased response to external stimuli
- Chromosomal abnormalities or brain malformations have increased wakefulness and poor progression through sleep stages

Why are sleep problems more common?

- ID (30-50% of kids with CP have ID)
- Epilepsy
- Visual impairment
- Motor impairment
- Tone/pain
- Equipment

Assessment of Sleep Problems in CP
Causes of Sleep Disorders in Children with Physical Disabilities

1. Altered perceptions of environmental cues; e.g. light/dark, feeding schedules
2. Abnormal hormone release
3. Lack of cyclic organization
4. Seizures → disturbed/fragmented sleep
5. Upper airway obstruction
6. Physical disabilities/immobility
7. GERD
8. Medication effects
9. Challenges in teaching good sleep hygiene and limit setting


Questionnaire and sleep disturbance scale sent to rehab clinic and school representative sample
  ▪ Group I: n = 245 with motor disability
  ▪ Group II: n = 2891 general population
Results: co-sleeping significantly more common in motor disability group. 11.8% (group I) vs 7.9% (group II)
Reasons reported: epilepsy, age, house crowding, visual impairment, pathologic sleep
Management of Sleep Problems

1. Manage comorbid conditions
   - pain, spasticity, GERD
2. Manage primary sleep disorders
   - sleep related breathing disorder/OSA
3. Circadian rhythm disorders
4. Chronic insomnia
5. Pharmacotherapy

Management of Sleep Disorders in Child with Physical Disabilities

- Insomnia—(consider reflux)
- Night time awakenings—(consider spasms/pain/inability to move)
- Feeding tube—(consider timing)

Principles of Treatment

- Comprehensive sleep history
  - Sleep hygiene, bedtime routine, schedules, environment
- Severity, frequency, duration of problems
- Previous treatment attempts
- Screen for primary sleep disorder
- Behavioral intervention can improve sleep – therefore ALWAYS FIRST LINE
- Medication SECOND LINE and/or in conjunction with behavioral intervention
Treatment: Sleep Hygiene

- Schedule
  - Regular waking time, bedtime, nap time
- Activities
  - No frightening T.V. or stories
- Environment
  - Dark, quiet, comfortable
  - No vigorous physical activity before bedtime
  - No computer games before bedtime
  - Child put into bed awake

Insomnia Management

- Is the bedtime realistic?
- Is the bedtime routine consistent?
- Review the routine
dinner, playtime, bath...
- Sleep associations: correct or incorrect?
music, parent cuddling, hall light...

Night Awakening Management

- Sleep diary
- Identify incorrect sleep associations
- Identify positive reinforcers
- With caregiver prioritize/remove incorrect sleep associations and/or positive reinforcers
**Principles of Medication Management**

- Failure to respond to behavioral intervention, parental inability to implement
- Within context of medical illness or self limited situations
- Contraindicated when potential exists for drug-drug interactions
- Inappropriate parent expectations/goals

**Safety Considerations**

- Screen for concurrent use of non-prescription sleep aids/herbal supplements
- Screen adolescents for alcohol, drug use
- Monitor sleep meds for side effects
- Caution re: respiratory depressant meds in co-morbid OSA and some SSRIs can exacerbate restless leg syndrome
Medication Management: Clonidine

- Noradrenergic alpha 2 agonist - often prescribed to target insomnia in children with ADHD
- Paucity of data regarding efficacy and safety in pediatrics

Medication: Melatonin

- Produced by pineal gland
- Regulates circadian rhythms
- Synchronizes sleep-wake cycle/light-dark cycle
- Release regulated by hypothalamus/innervation from the retina
- Release ± influenced by environmental/social cues

Melatonin/Developmental Disorders

- Postulated reasons for sleep disorders:
  - abnormal function of circadian rhythm
  - decreased: melatonin production
  - expression of melatonin receptors
  - sensitivity to melatonin
Melatonin & CP/TBI


  - Search yielded 19 articles relevant for CP, 1 for TBI, 4 of 20 were RCT
  - Melatonin studies: improves sleep latency, night awakenings and total sleep time

Melatonin Evidence

- Short term use studies have few side effects overall
- Long-term effects largely unknown
- One report of lowered seizure threshold vs. other studies – no increase in seizures
- ? Proinflammatory properties – use with caution in children receiving cortico steroids and children with asthma (Sutherland et al. 2002)

Melatonin Dosing

- Give 30’ before bedtime
- Dose range 1-10 mg
- Usual starting dose:
  - < 25 kg  1-6 mg
  - > 25 kg  3-10 mg
- Increase after 3 nights if necessary
- Wean after 2-4 mo successful therapy
- Discontinue after 2 weeks if no response
Antihistamines, Chloral Hydrate, Barbiturates

- OTC antihistamines most commonly used in pediatric practice
- Benzodiazepine activate GABA receptors – short term use, especially with coexisting anxiety
- Clonazepam useful for periodic limb movement disorder and severe parasomnias (sleep walking, night terrors)
- Risk of habituation/addiction, potential for withdrawal on discontinuation

Medication Use in the Treatment of Pediatric Insomnia: Results of a survey of Community Based Pediatricians Owens, J. et al. Pediatrics 2003

N = 671 from 6 cities
Results:
- >75% recommended non-prescription med (antihistamines most common)
- >75% prescribed sleep med

Chloral Hydrate

- 1993 AAP statement: short term use only for sedation not sleep disorders
  - theoretical risk of carcinogenicity in animal studies, hepatotoxicity
Herbal Supplements

- Largely untested in pediatrics
- Practice review AA Sleep Medicine: lemon balm, chamomile and passion flower, kavakava and tryptophan have no efficacy

Take Home Message

- Detailed history of 24 hour day/diary
- Behavior intervention 1st
- Medication 2nd line with behavior program
- Sleep behavior change is slow
change one behavior at a time
- Reassure and support families
- Realistic goals
Case

- Parents of an 18 mo. old male diagnosed with spastic quadriplegic CP present with concerns about frequent night awakenings. JT falls asleep while being held/carried by parents for 30 min. He wakes min 3 times per night. Parents are unsure if it is due to spasms or inability to change position easily. Mother responds by giving a bottle. Intake 3-8 oz/bottle/night. If unsuccessful mother brings into her own bed.

Amanda is a 3-year-old who was sleeping well until recently, but the parents now have great difficulty getting her to fall asleep at night. She is complaining of fears (scared of wolf in closet, monsters under her bed). The bedtime routine now consists of parents thoroughly searching the room with a light to prove it is safe. Amanda is now taking 2 hours to fall asleep each night. Parents hold her hand, sing and talk softly until Amanda falls asleep. Amanda wakes up once nightly and comes into the parents bed. Frequently the parents sleep through this.