Sleep Disorders in Children

- **Autism:** 44-83% (Richdale, 1999)
- **Typical Development:**
  - Ages 1-5 years: 25-30%
  - School age: 10-12%
- **Developmental Disabilities:** 34-81%
  
  (Stores, 2001)

Sleep in Children with Autism

- Restlessness, night terrors and need for a parent to be present at sleep onset were areas that are most different.
- Sleep disorders are more common in children with greater cognitive delay.
- However, children with high functioning autism still have more sleep problems than children with typical development with the same level of cognitive function.

Objective

- Participants will identify co-morbid conditions associated with autism spectrum disorders (ASD).
- Participants will become aware of practice pathways and toolkits regarding co-morbid conditions associated with ASD.

Insomnia

Causes and Correlates of Insomnia in Children with Autism Spectrum Disorders

- Neurobiological Factors
- Sleep Habits
- Medical Disorders
- Anxiety, Depression
- Attention deficit/hyperactivity
- Obsessive Behavior

Financial Disclosures

- No relevant financial relationships with any commercial interests.
Insomnia Practice Pathway


Medical Conditions that may affect Sleep

- Pain/Itching: Dental/Hunger/Eczema
- Nutrition: Iron intake/Restless Sleep
- Co-morbid psychiatric disorders like anxiety and depression

Medical Conditions that may affect Sleep are often overlooked in children with ASD

- Gastrointestinal: Reflux/Constipation/Abdominal Pain
- Seizures: Seizures
- Sleep Disordered Breathing: Snoring/Allergies/Nasal Congestion
- Asthma/Sinusitis: Coughing

Don’t Forget

- Ask about Caffeine ingestion
- Noise, temperature, light
  - Parent or sibling that is up during the night
  - Does the child share a room or bed
  - Is the child hypersensitive to noise and light
- Safety: Consider door alarms for kids that are up and roaming around the house during the night

Autism Speaks Sleep Toolkit

Strategies to Improve Sleep in Children with Autism Spectrum Disorders

Ann Reynolds, MD / 2
Meta-analysis
Melatonin in Intellectual Disability
- Nine studies (total of 183 individuals with ID)
- Melatonin:
  - Decreased sleep latency: mean of 34 minutes (p<0.001)
  - Increased total sleep time: mean of 50 minutes (p<0.001)
  - Decreased the number of night waking (p<0.05)

Melatonin in ASD
- Open label trial: Melatonin improved sleep latency, as measured by actigraphy, in most children at 1 or 3 mg dosages. It maintained effects over several months, was well tolerated and safe, and showed improvement in sleep, behavior, and parenting stress.
- Malow, Melatonin for Sleep in Children with Autism: A Controlled Trial Examining Dose, Tolerability, and Outcomes, (2011) JADD

Frequency of GI symptoms in ASD
- GI symptoms in 9-70%
- Great Review: Buie (2010), Recommendations for Evaluation and Treatment of Common Gastrointestinal Problems in Children With ASDs, Pediatrics 2010;125;S19-S29
- ASD’s have been associated with:
  - Diarrhea
  - Constipation
  - Constipation alternating with diarrhea
  - Gastroesophageal reflux [GER]
  - Abdominal pain

Frequency of GI symptoms in ASD
- Valicenti-McDermott(2006): Lifetime prevalence: ASD-70%, DD-42%, Typ-28%
- Ibrahim(2009): Constipation and feeding disorders increased in ASD compared to children with typical development,
  Constipation: ASD-34%, Typ-18%,
  Feeding: ASD-25%, Typ-16%

Gastrointestinal Function in Autism Spectrum Disorders
- GI symptoms must be addressed and not considered “just part of autism”
- Often no failure to thrive or obvious pathology
- Many alternative and complementary therapies are used in an attempt to treat GI symptoms
**Practice Pathway for Constipation**

- Furuta, et al., *Management of Constipation in Children and Adolescents With Autism Spectrum Disorders*, *Pediatrics* 2012;130;S98

**Autism Speaks Toolkits**

- Toilet Training Toolkit
- Soon to come: Constipation Toolkit

**ADHD in ASD**

- Epidemiologic studies in the U.S. have found a prevalence of ADHD of 8.7% in children and 4.4% in adults.
- 41-78% of children with ASD have symptoms of hyperactivity and impulsivity with or without inattention
- DSM-IV-TR does not allow giving both diagnoses at the same time. DSM-V is anticipated to allow concurrent diagnoses

**Clinical Practice Pathway for ADHD in ASD**

- Adhikari et al., *Clinical Practice Pathways for Evaluation and Medication Choice for Attention-Deficit/Hyperactivity Disorder Symptoms in Autism Spectrum Disorders*. *Pediatrics* 2012;130;S125.
Stimulants and ASD
- 1 large RCT found that 49% of children with ASD responded to MPH compared to 69% of children with typical development in the MTA study.
- 18% discontinued MPH due to side effects (especially irritability) compared to 1.4% in MTA.
- Posey, 2005, Brookman-Frazee, 2006

Stimulants and ASD
- Start with low dose short acting MPH, then can switch to long acting once dose determined.
- If not effective can switch to amphetamine salt.

Non-Stimulants in ASD
- Atomoxetine is a selective norepinephrine reuptake inhibitor.
- One small RCT crossover pilot study, 50% response rate, compared to 25% with placebo.
- In typical children appears to be effective in those with comorbid anxiety.
Genetics of Autism

- Autism is a Heterogeneous Disorder
- Rate of known genetic conditions is a moving target due to changes in diagnosis and technology
- Known Genetic Conditions in <10% of children with autism (10-20% in the past)
- May be higher with use of microarray or whole exome sequencing

Regression/Plateau

- Occurs in about 30% (depends on how it is defined—we are learning more from prospective studies)
- Usually occurs between 12 and 24 months with average 16-17 months
- The loss is usually gradual. It can co-occur with atypical development and can be fluctuating

Genetics of Autism

- Whole exome sequencing detects small mutations in the areas that code for genes, ~2% of the genome
- Paternal Age leads to increased mutations
- Autism associated with greater number of de novo mutations

- Autistic Spectrum Disorder

Recurrent Risk if No Identified Cause

- 2 – 15%*
- Up to 25 - 50% after second affected child

Twin Concordance:

- Monozygotic- 60% ASD, 90% Broader Phenotype
- Dizygotic – 5% older study, 27% more recently**

Multifactorial Inheritance

- Multiple gene effects with possible environmental buffering

Epigenetics

*Ozonoff (2011), ** Hallmayer (2011)

Proposed Regression Workup Varies by Specialty

- Overnight EEG to rule out ESER if:
  - History vs. Active Regression
  - Late onset > age 2 years
  - Multiple/recurrent

- Metabolic Workup: At least Serum Amino Acids, Urine Organic Acids, CMP, Acylcarnitine/Free Carnitine, tests should be based on presentation

- Consider Referral to Neurology/Metabolic
- Consider MRI
AAP Guidelines

- AAP Autism Toolkit

Web Site Resources

- www.autismspeaks.org

Questions