Autism Spectrum Disorder

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Learning Objectives

- Review current criteria of Autism Spectrum Disorder according to the DSM-5 while discussing “red flags” necessitating a referral for further evaluation
- Discuss components of a neuropsychological/developmental evaluation
- Discuss considerations when treating patients with Autism Spectrum Disorder

Early Identification is Lacking

-15% of children have a developmental or behavioral disability such as autism, intellectual disability, and Attention-Deficit/Hyperactivity Disorder.
In addition, many children have delays in language or other areas, which also impact school readiness.
However, less than 50% of these children are identified as having a problem before starting school, by which time significant delays may have already occurred and opportunities for treatment have been missed.

Benefits of Early Intervention

- Neurological evidence suggests that the brain’s plasticity during early childhood allows for the creation of new neural connections that yield new behaviors and skills
- Provides parents social support that can in turn appease family stress and foster family cohesion
- Provides parents strategies that can support their child’s development

Early Screening

- 9 months
- 18 months
- 24 or 30 months

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Autism Spectrum Disorders

- A group of neurodevelopmental disorders characterized by deficits in communication and socialization, as well as by the presence of restricted and repetitive behaviors

- DSM-IV-TR: Autistic Disorder, PDD NOS, Asperger’s Disorder, Childhood Disintegrative Disorder, and Rett’s Disorder

- DSM-V: Autism Spectrum Disorder

DSM-V Criteria

- Deficits in Communication and Socialization (all 3 must be present)
  - Impaired social-emotional reciprocity
  - Deficits in nonverbal communicative behaviors used for social interaction
  - Deficits in developing, maintaining, and understanding relationships

- Presence of Restricted and Repetitive Behaviors and Interests (at least 2)
  - Stereotyped or repetitive motor movements, use of objects, or speech
  - Insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior
  - Highly restricted, fixated interests that are abnormal in intensity or focus
  - Hyper- or hypo-reactivity to sensory input or unusual interest in sensory aspects of the environment

- Severity levels
  - Level 1 “Requiring support”
  - Level 2 “Requiring substantial support”
  - Level 3 “Requiring very substantial support”

Incidence

- ASD is reported to occur in all racial, ethnic, and socioeconomic groups (CDC)

- Prevalence rates have steadily increased
  - CDC reported prevalence rate of 1 in 150 in 2000, and 1 in 68 in 2010

- Ongoing debate about rise in prevalence:
  - Actual increased occurrence?
  - Improvement in diagnostic criteria?
  - Increased awareness and availability of ASD eval services?
  - Relaxing of diagnostic practice in order to obtain needed services for children?

- Gender ratio of 4:1 (male to female)

- However, ratio varies based on IQ
  - Ratio approaches 2:1 in those with ASD and moderate to severe intellectual disability

- ASD commonly co-occurs with other developmental, psychiatric, neurologic, chromosomal, and genetic diagnoses. The co-occurrence of one or more non-ASD developmental diagnoses is 83%. The co-occurrence of one or more psychiatric diagnoses is 10%.

Comorbidity

- Intellectual disability (40-69%)
- Anxiety disorders (7-84%, with high rates of specific phobia)
- Depression (4-58%)
- Tic disorders (6%)
- Seizure disorders (11-39%)
- ADHD (up to 55%)
  - DSM-V allows diagnosis of both

**Behavioral presentation varies considerably**

First year of life
- ASD can be diagnosed as early as 18-24 months
- Some signs evident in children as young as 6 months

“Red Flags” 6-12 months of age

- Delayed vocal sound production
- Decreased frequency of simple babbling
- Reduced frequency of pointing
- Atypical eye contact
- Lack of social smiling
- Failure to respond to name
- Emotional flatness
- Atypical disengagement of visual attention
- Diminished interest in social interaction
- Unusual/repetitive hand and finger mannerisms

Milestones in Children from 4 to 15 months

“Red Flags” 12-24 months

- Earlier symptoms become more evident
- Lack of interest in peers
- Limited imitation of others
- Low rates of joint attention
- Restricted range of functional and imaginative play
- Greater frequency and duration of repetitive hand and finger mannerisms and preoccupation with parts of objects

“Red Flags” 12-24 months

- Delayed speech
- Delayed comprehension
- Limited use of complex babble, single words, and phrases
- Unusual prosody
- Delayed and immediate echolalia
- Limited nonverbal communication
  - Reduced frequency of pointing and other gestures
- Limited range of facial expressions
- Facial expressions less commonly directed at others
- Less integration of gaze with vocalization
20-47% of children with ASD appear to exhibit few symptoms until they experience a marked loss of language and/or socialization skills around the age of 15-24 months.

Any loss of speech, babbling or social skills at any age is concerning.

No empirical support for relationship between vaccines and regressive onset of ASD.

Communication may improve, but language notable for other abnormalities:
- Echolalia, unusual prosody, limited reciprocal conversation
- Nonverbal communication impaired
- Limited gestures and joint attention, unusual eye contact, limited range/use of facial expressions
- Functional and imaginative play restricted in range and/or frequency
- Frequency of restricted interests and repetitive behaviors often increase

Abnormalities in verbal/nonverbal communication and socialization skills generally remain.

With intervention:
- May gain adaptive daily living skills
- May become more aware of societal rules
- More interested in fulfilling wishes of others → decrease in public display of repetitive behaviors

5-20% of individuals may no longer meet criteria for ASD and function within normal limits of social relationships.
- INTENSIVE EARLY INTERVENTION

Little is known about ADHD symptomatology.

~50% have poor outcomes:
- High level of residential assistance
- Few friends
- Supported or no employment
- Many ARE employed for at least several hours each week

Developmental

Autism specific

Neuropsychological
Developmental Assessment

- Domains assessed:
  - Physical (e.g., reaching, rolling, crawling, walking)
  - Cognitive (e.g., thinking, learning, solving problems)
  - Communication (e.g., talking, listening, understanding)
  - Social/Emotional (e.g., playing, feeling secure and happy)
  - Adaptive/Self-Help (e.g., eating, dressing)

Developmental Assessment

- Most common:
  - Bayley Scales of Infant and Toddler Development (3rd Edition)
  - Mullen Scales of Early Learning

Developmental Assessment

- Weaknesses:
  - Difficult to use with a severely physically or sensory impaired child (may underestimate child’s ability)
  - Children/families not proficient in English not included in normed sample

Adaptive Functioning

- Practical, everyday skills required to function and meet environmental demands
  - Including effectively and independently taking care of oneself and interacting with other people
  - Need to identify independent behaviors and what an individual actually does on their own without assistance from others, in addition to what they may be able to do

Adaptive Functioning

- Vineland – 2nd Edition
  - Ages birth to 90
  - Communication/Daily Living Skills/Socialization/Motor Skills/Maladaptive Behavior Index

Assessment of Adaptive Skills

- Adaptive skills assessment can provide important information for diagnosis and planning of treatment or intervention for individuals with developmental delays, biological risk factors, TBI, ASD, ADHD, health impairments, etc.

- Disability and special education regulations routinely require a comprehensive adaptive behavior assessment

- Adaptive Behavior Assessment System – 2nd Edition (ABAS-II)
  - Birth to age 89
  - ABAS-II is the only instrument to incorporate current American Association on Mental Retardation (AAMR) guidelines by providing composite norms for three general areas of adaptive behavior (conceptual, social, and practical).
Mean GAC of children with ASD ranged from 64 (parent form) to 67 (teacher form), significantly lower than control groups of 98-102, respectively.

Greatest deficits in:
- Communication
- Health & Safety
- Leisure
- Social Skill Areas

Least deficits in Functional Pre-Academics

Matthews, et al. (2015):
- Daily living skills were a relative strength compared to communication and socialization in adults, but not adolescents.
- In general, highest subdomain scores were observed in writing skills and lowest scores were observed in interpersonal skills.
- Regardless of cognitive ability, all standard scores were well below average, indicating a need for lifelong intervention that targets adaptive functioning.


Autism Evaluation
- Autism Diagnostic Observation Schedule – 2nd Edition (ADOS-2)
  - Interactive tool that involves direct observation of a behavioral sample through a series of reciprocal play and social routines
  - Semi-structured, standardized assessment of:
    - Communication
    - Social interaction
    - Play
    - Restricted and repetitive behaviors
  - Presents various activities that elicit behaviors directly related to a diagnosis of ASD

Autism Evaluation
- Autism Diagnostic Interview-Revised (ADI-R)
  - Parent interview
  - Catches info about early development and core deficits involved in ASD
  - Useful for evaluation repetitive behaviors, stereotyped interests, and rigid preferences that may not be directly observable during an evaluation
  - Administration time: 90-150 minutes
  - Available in multiple languages

Autism Evaluation
- Childhood Autism Rating Scale (CARS)
  - Behavior rating scale
  - 15 items representative of a characteristic, ability, or behavior common to children with autism and/or developmental disability
  - Scores are based on severity
  - Indicates how noticeably the child’s behavior deviates from that of a typically developing child
Autism Evaluation

- Gilliam Autism Rating Scale – 3rd Edition (GARS-3)
  - Updated to reflect DSM-V diagnostic criteria
  - Ages 3 through 22
  - 56 items
  - 6 subscales:
    - Restrictive/Repetitive Behaviors
    - Social Interaction
    - Social Communication
    - Emotional Responses
    - Cognitive Style
    - Maladaptive Speech

Neuropsychological Assessment

- Concerned with relationships between the brain and behavior
- Try to characterize behavioral and cognitive changes resulting from central nervous system disease or injury
- Assessment of how one’s brain functions, which indirectly yields information about the structural and functional integrity of your brain
- Determine a pattern of cognitive strengths and weaknesses and, in turn, understand more about how the brain is functioning

Neuropsychological Assessment

- Data coupled with information from clinical reports, behavioral observations, and self/parent/teacher reports

  - Cognitive
    - Verbal vs. Nonverbal Reasoning Skills
  - Language
  - Attention
  - Executive Functioning
    - Including working memory and processing speed
  - Memory
  - Visual-Spatial/Visual Perception/Visual-Motor
  - Fine Motor
  - Emotional/Behavioral/Social
  - Academic Screener

Neuropsych – Test Engagement

- Pragmatic language deficits may interfere with understanding nature of testing situation
  - Difficulty staying on task, paying attention, answering questions in a relevant manner
- May lack social motivation or experience social anxiety
- May perseverate on topics or tasks of interests
- Hyperarousal to testing stimuli
- May be rigid – difficulty with transitions

Things to Consider

- In high-functioning individuals, IQ > adaptive

  - Adaptive functioning results are useful in planning intervention treatment
    - Focus on developing basic self-help skills
  - Need to consider IQ and adaptive skills to assist with educational and vocational placement and career planning
  - Lower IQ → more likely to have poorer adaptive functioning and independence later in life
  - Need intensive intervention services

Neuropsych Results

- An uneven profile is characteristic of individuals with ASD with general relative strengths in visual-spatial nonverbal measures and a concurrent weakness in verbal ability

  - Intelligence
    - High degree of variability
    - 50-70% of children with ASD have IQ<70
    - Nonverbal > Verbal
    - Asperger’s IQs > Autism or PDD-NOS

  - Adaptive Behavior/Skills
    - Highly variable
    - Typically most pronounced deficits in socialization and communication domains
Neuropsych Results

Language
- Generally absent to low levels of language as toddlers and at preschool age
- Many do speak with time + intervention

Strengths:
- Phonology, articulation, basic grammar, single-word vocab

Difficulty:
- Semantics, conversation, constructing narratives, prosody, comprehension, pragmatic use of language

Things to Consider
- Early language skills are strong predictor of outcome

Speech & Language should focus on both semantic and grammatical skill acquisition, while developing functional communication
- Target communication goals in both structured settings and naturalistic day-to-day tasks/activities
  - Target both semantic and pragmatic language skills
- Picture exchange communication system and sign language may be appropriate for young children who are not yet using words or phrase-speech

Neuropsych Results

Visuospatial Abilities
- Sometimes enhanced visual-perceptual processing abilities

- Deficits in face processing and face recognition ability
  - Attend significantly less to the eyes when viewing a face, which can contribute to social skill difficulties

Things to Consider
- Sensory impairments can significantly impact functioning

- OT can target sensorimotor impairment
  - Teaching specific motor skills
  - Modulate env’t to reduce unpleasant stimuli

- Behavior therapy
  - Help to desensitize individual to aversive stimuli
  - Teach relaxation and cognitive strategies

- Hearing should be tested before diagnosis!

Neuropsych Results

Sensorimotor Functions
- Impairments common in fine and gross motor skills that involve planning and execution
  - Abnormal gait, posture, coordination, muscle tone

- Sensory impairments can impact cognition and behavior patterns
  - Auditory oversensitivity and visual self-stimulation are most common

Things to Consider
- Memory/Learning
  - Highly variable

- Memory for social and emotional info tends to be selectively impaired

- Factual info recall tends to be intact, whereas recall of autobiographical info is often impaired, except for particularly salient events

- Lower functioning individuals rely heavily on procedural forms of learning

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Imitation impairments can impede learning
- Focus on developing imitation skills as early as possible
- Programs can target simple vocal and motor imitation and progress to complex verbalizations and actions

**Things to Consider**

**Neuropsych Results**

**Attention/Concentration**
- May demonstrate impairments in automatic allocation of attention, controlled attention, and working memory
- Heightened attention to personally salient stimuli

**Processing Speed**
- Likely impaired on verbally loaded tasks
- May be ok on spatial, nonverbal tasks
- Weakest relative to other indices using WISC-IV in a group of high-functioning (IQ > 70) children (age 10) with autism (Oliveras-Rentas, Kenworthy, Roberson, Martin, & Wallace, 2012)
- Even if unimpaired on testing, processing speed is still often slowed in natural settings where distractions place burdens on attention

**Things to Consider**

**Executive Functions**
- Deficits common
- Planning, shifting attention, monitoring performance, cognitive flexibility
- Significant impairment in cognitive and behavioral inhibition
- May perform well on testing in the highly structured environment, yet exhibit deficits in naturalistic env’t
- Parent and teacher reports are important!

**Supports and environmental changes can assist with planning and organizational skills**
- Cognitive shifting difficulties can be counteracted with:
  - Clear, time-dependent instructions
  - Warnings for transitions
  - Barriers set to prevent perseveration
- Visual schedules can help a child stay on task

**Emotion, Personality, Social Behavior**
- Poor quality of reciprocal social interaction
- Social overtures may be unusual in quality or restricted to personal demands/interests
- May lack integration into context or be socially inappropriate
- Limited empathic ability
Explicit teaching of social skills is important

Basic skills for younger children and lower functioning:
- Eye contact, imitation, requesting, simple reciprocal interactions
- More interactive play skills and complex understanding of social interactions as child matures
- High functioning children often have social anxiety
  - CBT can increase skills and confidence while relieving anxiety

Things to Consider

- Early intervention
  - The younger child begins to receive treatment, the better
  - Greatest likelihood for success if begun prior to age 5
  - Optimal age between 2 and 3 years old

- Medications & Diet
  - As many as 70% older than 8 have received a psychoactive medication
  - SSRIs approved to treat irritability, aggressive behaviors, self-injurious behaviors, tantrums, and rapid shifts in mood in children age 5-16 with ASD
  - Stimulants common tx for attentional difficulties
  - Other medications are being explored as potential treatments

Things to Consider in General

- Behavioral Management and Skills
  - Intensive ABA (15-25 hours/week) shown to be effective to guide preferred behaviors and teach skills in a stepwise fashion
  - Sustained attention improves with strong incentives
  - Younger and lower-functioning children may demonstrate increased repetitive behavior in clinical setting due to unfamiliarity and testing demands
  - Younger and lower-functioning ➔ Motor stereotypies
  - Older and higher-functioning ➔ Resistance to change and preoccupying interests

- Repetitive behavior requires a functional assessment
  - Data on ABC
  - Typical functions:
    - Escaping demands
    - Attention seeking
    - Intrinsic reinforcement
    - *Most difficult to treat

- Psychological & Emotional Issues
  - Comorbid conditions need to be considered
  - CBT can be helpful for high-functioning children who are motivated to participate
  - Behavioral therapy and relaxation training
    - May be helpful for anxiety in lower functioning children
  - Mediation for depression, anxiety, sleep problems, and irritability/aggression

- Individuals with low IQs and adaptive abilities are most likely to engage in repetitive self-injury and violent behaviors toward objects or others

- CARD Center for Autism and Related Disorders
  - http://centerforautism.com/services.aspx

- Arizona Family Resource Counseling Center

- BISTA Behavioral Interventions, Support, Treatment, and Assessment
  - http://www.bistacenter.org/contact-us/

- Specializing in Education of Exceptional Kids (SEEK)
  - http://www.seekarizona.org/

- Southwest Autism Research and Resource Center (SARRC)
  - http://www.azaba.org/
Thank you!

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Any questions?