Approach to ADHD and Autism

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Causes of hyperactivity

Medical causes-
- Sensory deficits (hearing and vision)
- Thyroid disorders
- Adverse effects of medications
- Substance abuse

Neurological-
- Seizure disorders
- Posttraumatic head injury
- Post encephalitic disorder
- Auditory and visual processing disorders

causes

With possible ADHD presentation
- anxiety disorders
- Language disorders
- Learning disorders
- Conduct disorders
- Oppositional- defiant disorder
- Depressive disorder

Diagnosis associated with ADHD
- Adjustment disorder
- PDD
- Tourette Syndrome
- OCD/ psychosis, schizophrenia

ADHD: What is It?

- **Triad:**
  - **Inattentiveness,**
  - **Hyperactivity,**
  - **Impulsiveness**
- **3 to 5% of U. S. school-age children meet criteria for ADHD**
- **On average 3.5 times as many boys as girls.**
- **early difficult temperament Maladaptive and Pervasive**
- **Academic and Behavioral Problems**
- **Onset Prior to Age 7**
- **Probable Organic Cause-Exact Etiology Unknown**

Neurotransmitters IN ADHD

a) **Dopamine**; synthesis in Substantia Nigra of midbrain; tracts to Frontal lobes, Basal ganglia,hypothalamus.functions of relevance; vasomotortone, Motivation and Reward, Working Memory and Attention, Motor control

b.) **Serotonin**; synthesis in the Dorsal Raphe of the brainstem;function in affective regulation

c.) **Norepinephrine**; synthesis in the Locus Ceruleus of brainstem; function in Attention systems and vasomotor tone

d.) **GABA-** (G- Aminobutyric acid) inhibitory modulator, signals within the Stiatal-Thalamic- Frontal loop

e.) **Enkephalin**- a positive modulator signals from the frontal cortex with excitatory input to the Striatum

Approach to Diagnosis

- **History.**
- **Standardized Checklists/Questionaires**
- **Exclusion of Differential diagnosis by**
  - **Physical Exam**
  - **IQ testing, audiometry, eye screening**
  - **Multidiscliplinary Approach**

History

- **Behavioral**
  - **classroom, home , meals**
  - **interactions with peers**
- **Medical: school performance, developmental history**
- **Neurological and Psychiatric problems**
- **Family**
  - **ADHD, tics, psychiatric disorders**
- **Social**
  - **Family Dysfunction**
  - **Parenting Skills**

DSM IV CRITERIA FOR ADHD

A. Either (1) or (2)

(1) Six (or more) of the following symptoms of **inattention** have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

A. often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities.

B. often has difficulty sustaining attention in tasks or play activities.

C. often does not seem to listen when spoken to directly.

D. often does not follow through on instruction and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions)

E. often has difficulty organizing tasks and activities.

F. often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework).

G. often loses things necessary for tasks or activities (e.g. toys, school assignments, pencils, books, or tools).

H. is often easily distracted by extraneous stimuli.

I. is often forgetful in daily activities

DSM IV CRITERIA FOR ADHD

2.) Six (or more) of the following symptoms of **hyperactivity-impulsivity** have persisted for at least 6 months to a degree that is maladapative and inconsistent with developmental level:

Hyperactivity

- often fidgets with hands or feet or squirms in seat.
- often leaves seat in classroom or in other situations in which remaining seated is expected.
- often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness).
- often has difficulty playing or engaging in leisure activities quietly.
- is often "on the go" or often acts as if "driven by a motor".
- often talks excessively.

Impulsivity

- often blurts out answers before questions have been completed.
- often has difficulty awaiting turn.
- often interrupts or intrudes on others (e.g. butts into conversations or games).

B. Some hyperactive-impulsive or inattention symptoms that caused impairment were present before age 7 years.

C. Some impairment from the symptoms is present in two or more settings (e.g. at school or work] and at home)

DSM IV CRITERIA FOR ADHD

D. There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning.

E. The symptoms do not occur exclusively during the course of a Pervasive Developmental Disorder, Schizophrenia, or other Psychotic Disorder and are **not better accounted for by another mental disorder** (e.g. Mood Disorder, Anxiety Disorder, Dissociative Disorder, or Personality Disorder).

Code based on type:
ADHD, Combined Type:
Both Criteria A1 and A2 are met for the past 6 months.
314.00 ADHD, Predominantly Inattentive Type:
Criterion A1 is met, but Criterion A2 is not met for the past 6 months.
314.01 ADHD, Predominantly Hyperactive-Impulsive Type:
Criterion A2 is met, but Criterion A1 is not met for the past 6 months.
Coding Note:
For individuals (especially adolescents and adults) who currently have symptoms that no longer meet full criteria, "In Partial Remission" should
be specified.
ADHD, Not Otherwise Specified:
There are permanent symptoms of inattention or hyperactivity impulsivity that do Not meet criteria for ADHD.

Difficulty in Diagnosis

- **DSM criteria also describe NORMAL kids.**
- **No Physical or Lab Markers**
- **Significant Overlap with D/D**
- **Public Awareness, Misinformation**

Physical Exam

- **Directed**
  - **Hearing and Vision Screening**
  - **Developmental Milestones**
- **PE cannot confirm Diagnosis,**
- **Helps rule OUT other D/D**

Evaluation Tools:

Behavior rating scales

- Conner rating scales
- SNAP (swanson, nolan and pelham checklist)
- AcTERS (ADDH comprehensive teacher rating scale)
- CBCL (child behavior checklist) etc

Imaging Techniques

1. MRI – Magnetic Resonance Imaging
2. SPECT – Single Photon Emission Computed Tomography
3. PET – Positron Emission Tomography

Comorbid Conditions

- Learning disorders: reading , math, auditory processing, etc.
- Epilepsy; primary generalized types
  Partial complex epilepsy
- Familial hyperthyroidism
- Mental Retardation (MR) and Borderline Intellectual Functioning
- Autism; pervasive developmental disorders (PDD)

- Major Depression, child, adolescent, young adult, etc.
- Bipolar Disorder; mixed, depressed, hypomanic Oppositional Defiant Disorder
- Conduct Disorder
- Substance Abuse; marijuana, alcohol, etc.
- Tourette Syndrome; the great masquerader; vocal
- motor Tics + OCD and ADHD spectrum.

Treatment Rational

1. Identify core *vs*. comorbid conditions
2. Treat in stages; identify suspected neurotransmitter defect first.
3. Increase " online time " of circuits involved with processing attention, working memory, affective state.
4. Increase Dopamine (DA) availability in Prefrontal Cortex and Basal Ganglia DA increase is achieved by
   A) limiting reuptake via blocking transporter proteins – methylphenidate, amphetamine
   B) increasing its release from the presynaptic cell; dopamine and nor epinephrine vescicle - amphetamine

Drug for ADHD

ADHD stimulants:
1. Amphetamine ;
2. Methamphetamine
3. Methylphenidate (Ritalin)
4. Pemoline HCL

Non Stimulant based treatment
Atomoxitine-
Tricyclic antidepressants- imipramine,nortryptyline
Alpha agonist-clonidine

Multidisciplinary Approach

- **Primary Provider**
- **Psychoeducational Consultant**
  - **academic, aptitude, and psychometric testing**
  - **IQ measurement**
- **Social Services**
- **Counseling Services-Individual and Family**
- **Drug therapy**
- **Treatment of co morbid conditions**

Take home message

- Hyperactivity doesn't mean ADHD
- DSM IV criteria help to classify ADHD
- Multidisciplinary approach to ADHD t/t

Pervasive developmental disorders

- Autistic disorder
- Rett syndrome
- Asperger disorder
- Childhood disintegrative disorder

Autism

- Autism is a neurodevelopmental disorder of unknown etiology, but with a strong genetic basis. It develops and is typically diagnosed before 36 mo of age. It is characterized by a behavioral phenotype that includes qualitative impairment in the areas of language development or communication skills, social interactions and reciprocity, and imagination and play (Table 29-2).

Diagnostic Criteria for Autism
AUTISTIC DISORDER

A. A total of 6 (or more) items from (1),(2), and (3), with at least 2 from (1) and 1 each from (2) and (3):

1Qualitative impairment in **social interaction**, as manifested by at least 2 of the following:

a. Marked impairment in the use of multiple nonverbal behaviors, such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction

b. Failure to develop peer relationships appropriate to developmental level

c. Lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g., by a lack of showing, bringing, or pointing out objects of interest)

d. Lack of social or emotional reciprocity

2. Qualitative impairments in **communication**, as manifested by at least 1 of the following:

a. Delay in, or total lack of, development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication, such as gesture or mime)

b. In individuals with adequate speech, marked impairment in ability to initiate or sustain a conversation with others

c. Stereotyped and repetitive use of language or idiosyncratic language

d. Lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level

3.Restricted, repetitive, and **stereotyped patterns** of behavior, interests, and activities, as manifested by at least 1 of the following:

a. Encompassing preoccupation with ≥1 stereotyped and restricted pattern of interest that is abnormal in either intensity or focus

b. Apparently inflexible adherence to specific, nonfunctional routines or rituals

c. Stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting or complex whole body movements)

d. Persistent precoccupation with parts of objects

B. Delay or abnormal functioning in at least 1 of the following areas, with onset < age 3 yr:

(1)social interaction,

(2) language as used in social communication, or

(3) symbolic or imaginative play

C. The disturbance is not better accounted for by Rett disorder or childhood disintegrative disorder

Etiology

- Multifactorial
- The first 2 yr of life are crucial in early brain development, and this period is characterized by tremendous neuronal and axonal growth, synapse formation, and myelination
- MRI studies done at 2–4 yr of age show that autistic toddlers have increased brain volume characterized by increased volume of the cerebellum, cerebrum, and amygdala compared with normal volumes

DIAGNOSIS

- Aberrant social skill development is the hallmark of autism spectrum disorders (ASDs), and early social skill deficits may include abnormal eye contact, failure to orient to name, failure to use gestures to point or show, a lack of interactive play, failure to smile, lack of sharing, and lack of interest in other children.
- Combined language and social delays and regression in language or social milestones are important early **red flags for an ASD**

Early signs

- unusual use of language or loss of language skills,
- nonfunctional rituals, inability to adapt to new settings,
- lack of imitation, and absence of imaginary play.
- decreased eye contact, failure to orient to name, and lack of joint attention, are often detected by 1 yr of age.
- The absence of expected social, communication, and play behaviors often precedes the emergence of odd or stereotypical behaviors or the unusual language usage that is seen in autism in the later years.

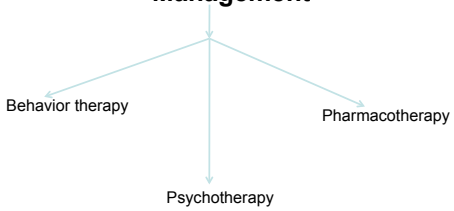
Several screening tools

- Checklist for Autism in Toddlers (**CHAT**)
- Modified Checklist for Autism in Toddlers (**M-CHAT**)
- The Pervasive Developmental Disorders Screening Test (**PDDST**)
- **CARS** (Childhood Autism Rating Scale)

Differential diagnosis

- Schizophrenia with childhood onset
- Mental retardation with behavioral symptoms
- Mixed receptive language disorder
- Congenital deafness
- Psychosocial deprivation

Management



Treatment

Behavioral training (applied behavioral analysis)

Drugs-

- atypical neuroleptics-risperidone, olanzepine
- Tricyclic antidepressants- clomipramine
- SSRI-
- Clonidine
- Naloxone

Prognosis

Good prognostic factors –

- Functional speech
- Higher intelligence
- Less bizarre behavior
- Early intensive therapy

Poor prognosis -

- Late diagnosis
- Decreased language
- Poor family support
- Seizures