ADHD Update and Focus on Learning Disabilities

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ADHD Prevalence -

- 3 to 5 % of school aged children
- M:F ratio for **combined type** = 4:1
  - Inattentive type is probably much closer to 1:1
- **1/3 to 1/2** of all mental health referrals for children
- Persists through lifespan
  - over 75% of adults who had ADHD as children have persistent functional impairment
ADHD: Initial Presentation

- Younger children reach MH services when their behavior is problematic
  - Adults because they feel bad
- Boys are more likely to be hyperactive (thus disruptive) than girls
- Boys are referred earlier and more often than girls
ADHD in Girls -

- ‘Spacy’, distracted, disorganized
- Unmotivated
- Disorganized, forgetful
- Often socially immature

Problems in school often identified later
- Assignments more complex, spread over time
- Organization and planning problems grow more obvious
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)
Inattention -

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

- often has difficulty sustaining attention in tasks or play activities

- often does not seem to listen when spoken to directly

- often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavioral or failure to understand instructions)
Inattention (cont'd)

- often has difficulty organizing tasks and activities
- often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)
- often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books, or tools)
- is often easily distracted by extraneous stimuli
- is often forgetful in daily activities
Twin Studies Show ADHD Is a Genetic Disorder

Parents with ADHD

- Have difficulty following through with consistent discipline, homework times, bedtimes
- Struggle with med compliance, remembering kids’ appointments
- Parents often seek assessment when they see their children respond to treatment
- Sometimes it’s better for school nurse to give meds
Increased Traffic Violations and Motor Vehicle Accidents in Adolescents and Adults with ADHD

Increased Lifetime Substance Abuse in Untreated Adults with ADHD

ADHD and Future Substance Abuse

- 1999: report of a strong *protective* effect (against drug abuse) on stimulant-treated white male ADHD patients

- this was not maintained at 10 year follow up
  - Treatment factors?

- Still, data indicate that stimulant treatment does NOT increase substance abuse risk

Do Stimulants Protect Against Psychiatric Disorders in Youth With ADHD? A 10-Year Follow-up Study  *J. Biederman, et al Pediatrics, July 1, 2009; 124(1): 71 - 78*
Assessment: Rating Scale -

- Rating scales are the most efficient way of obtaining data on school functioning
- Vanderbilt scale is easy, familiar to teachers, and can be interpreted by provider in seconds during a visit
- Symptoms grouped into inattention, hyperactivity, impulsivity
- Before- and after- treatment scales can help
  - Tracking response to med or dose change
Treatment Options

- What works best?
- MTA (multimodal treatment of ADHD) was a multicenter study of 579 children with ADHD (combined type), ages 7 to 9
  - Randomized to various treatments
  - Medication, behavioral therapy, both, or “community based”
  - Followed for 14 months
  - Meds and behavioral therapy > meds alone >> behavioral therapy
Medication Options

- General principal: enhance DA and NE transmission in PFC
- Stimulants (methylphenidate or amphetamine preparations)
  - Atomoxetine (NE, indirect DA)
  - Guanfacine, clonidine (NE)
- Antidepressants (variable)
Stimulants: First Line Therapy

- Response rate to first stimulant tried is about 70% across studies
- Changing non-responders to a second stimulant raises response rate to over 80%
- Side effects more common with comorbid:
  - Anxiety
  - Mood
  - PDD (autism-like) symptoms
Choosing a Stimulant -

- All are basically amphetamine salts or methylphenidate
  - Adderall XR®, Vyvanse®
  - Concerta®, Daytrana®, others

- Duration of action varies

- Adderall XR can be sprinkled

- Vyvanse can be dissolved in liquid

- Daytrana is a patch that can be removed at the time desired
Lisdexamfetamine (Vyvanase)

- L-lysine d-amphetamine
- Lysine remains bound in serum, but is cleaved by hydrolysis in GI tract
  - Parenteral use (snorting, injection) does not cause a ‘high’
- Limited rate of hydrolysis allows for long duration
Start low, go **fast**
- adderall XR: 5 mg increments
- In very small children, can open and sprinkle 2.5 mg on food
- concerta: 18 mg increments (have to swallow pill)

Response is immediate

Some kids (and adults) are rapid metabolizers- don’t be afraid to go up past 72 mg concerta, 30 mg adderall
Atomoxetine

- Norepinephrine reuptake blocker
- Indirectly increases dopamine in some areas of the brain (PFC)
- Does not increase dopamine in nucleus accumbens (less reward, so lower abuse potential)
- Response rate not as high as with stimulants
- Dosing: start with 0.5 mg/kg/day, titrate to 1.2 to 1.4 mg/kg/day  (100 mg/day max)
Atomoxetine: Rare toxicity

- 6 cases of drug-induced liver injury cited by FDA as of mid-2009, one resulting in death
  - Median age 10.5 (range 7-26)
  - Median time to onset 2 months (3wks- 2yrs)
Guanfacine (Tenex, Intuniv), and Clonidine (Catapres)

- Both are centrally-acting alpha-2 adrenergic agonists, acting in PFC
- Enhance attentiveness and working memory
- Inhibit impulsive behavior
- Can be sedating
- A good option for kids with Tourette’s if stimulants worsen their tics (50%)
- Clonididine great for insomnia with ADHD
Antidepressants

- Need to target DA and/or NE transmission
  - SSRI’s not helpful here
- Bupropion (lowers seizure threshold)
- Mirtazapine (weight gain, sedation)
- TCA’s (potential for cardiotoxicity)

- Always explain about risk of activation to mania or suicidal ideation
ADHD and Diet: the Research

- Sugar has *small* effect on aggression in some preschool boys
- If zinc deficiency present, supplement may augment stimulant effect
- “Healthy” diet associated with less ADHD than “western” diet in 14-year cohort
  - More fruits, vegetables, whole grains, fish
  - Less processed meat, high fat snacks
- Ketogenic diet may help kids with abnormal EEG’s

Millichap J et al. The diet factor in attention deficit disorder
Pediatrics Vol. 129 No.2 February 1, 2012
ADHD and Diet: the Research

- N= 75, double-blind, placebo controlled
- Daily dose: 558 mg EPA, 174 mg DHA, 60 mg gamma linoleic acid (an omega-6), and 10.8 mg vitamin E
- After 3 months, 26% of active group and 7% of placebo group ‘responded’ (had 25% improvement on ADHD measures)
- Responders had the biggest change in their omega 3:6 ratios

ADHD: Comorbid Conditions

- **About 75% have learning disabilities**
- 45-64% ‘oppositional-defiant disorder’
- 8-30% anxiety disorders
- 8-25% conduct disorder
- 15-75% mood disorders (any)
- 8-34% tics
- **Substance abuse, FAS, ARND**
  - girls with ADHD are more likely to become mothers of substance-exposed children
Learning Problems

- Often missed in children with ADHD

- Meds may result in improvement in effort, impulsivity, hyperactivity- but expected academic improvement doesn’t materialize

- Parents need to request testing **IN WRITING**
  - Particularly if performance is worse in one subject area, or if there is family history of LD, and in cases of prematurity, low birth weight, or suspected/known substance exposure
ADHD and Learning Problems

- Penn State study: 70% of children with ADHD found to have learning disability
- Children with ADHD had more severe LD
- Children with LD but not ADHD still had some focus/attentional problems

ADHD and Learning Problems

- 1312 sets of twins
- IQ, parent and teacher ADHD ratings, parent ratings of reading problems
- Reading problems and inattention were linked genetically
- IQ and hyperactivity varied independently

ADHD and Learning Problems

- Children with reading disorder show problems with early automatic error detection (in the moment)
- Children with ADHD show problems with post-hoc evaluation and detection of errors
- Children with RD and ADHD show BOTH

Van de Voorde S et al. Error monitoring in children with ADHD or reading disorder: an event-related potential study Biological Psychiatry; Vol 84 Issue 2: May 2010
LD and the Law (IDEA)

- Either a parent of a child or a public agency may initiate a request for an initial evaluation to determine if the child is a child with a disability. The initial evaluation:
  - Must be conducted within 60 days of receiving parental consent for the evaluation or, if the State establishes a timeframe within which the evaluation must be conducted, within that timeframe; and
  - Must consist of procedures to determine if the child is a child with a disability

http://idea.ed.gov/explore/home
Advocating for Special Ed Services

- Parents must request psycho-educational evaluation in writing in order to trigger IDEA (Individuals with Disabilities Education Act)

- School is then required to respond, and parents have rights to appeal, seek independent assessment, etc.

- Once a child has an IEP (Individual Educational Plan), it is a binding legal document, transferable if the family moves
Advocating for Special Ed Services

- Remember that many parents have ADHD or LD, and are not confident in approaching school authorities.

- Schools often put off parents’ verbal requests for testing—“let’s see how this semester goes first”, “he’s just not motivated”, or “she just likes to socialize too much”—when they ask about having their child tested.

- The squeaky wheel gets the grease, especially when budgets are shrinking.
Summary

- ADHD is a heritable disorder, associated with accidental injury, academic and employment failure, and substance abuse
- Be alert to the likelihood of learning problems, especially in reading
- Educate families about rights under IDEA, communicate with school
- Locate advocacy resources in your community
  - State department of education
  - ADHD parent groups