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ADHD in children and youth: Part 3 – Comorbidities – CPS Podcast

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Introduction:

Hi, my name is Renée Lurie and I am a third-year medical student at the University of Ottawa. This podcast was made in conjunction with PedCases and the Canadian Pediatric Society. This is part three of a three-part series based on the 2018 CPS Statements on Attention Deficit and Hyperactivity Disorder. This podcast discusses the new CPS statement, ADHD in children and youth: Part 3—Assessment and treatment with comorbid ASD, ID, or prematurity. These podcasts were created with the authors of the statements: Dr. Stacey Bélanger from the University of Montreal, Dr. Mark Feldman from the University of Toronto, and Dr. Brenda Clark from the University of Alberta. For additional information and to view the complete CPS statement, please visit cps.ca.

After listening to this podcast, the learner will be able to:

1. Recognize disorders that are at an increased risk for having co-morbid ADHD and why screening for ADHD is important in these disorders.
2. Understand how to diagnose ADHD in ASD and ID populations.
3. Identify overlapping symptoms between ADHD, ASD and ID.
4. Develop a multifactorial treatment approach for children with comorbid ADHD, and ASD or ID. Identify first-line medications and side-effects of these medications that are common in the ASD and ID populations.

Let's review our past case:

Sam is a 7-year-old boy whose parents took him to his primary care provider's office due to some difficulties he was having at school. You conducted a complete history and physical exam, had rating scales filled out and excluded common differential diagnoses. Sam was diagnosed with ADHD. You started him on a combination management plan of a stimulant medication and non-pharmacologic interventions. After a few months, Sam is doing much better. He is able to focus in class and has been less hyperactive around the house. During one of your appointments with Sam, you wonder if there are other children in your clinic with medical conditions, such as autism and intellectual

disabilities, which may warrant you to screen for ADHD. And in these children, how would diagnosis, treatment and management, of their ADHD, change due to their comorbid medical disorder?

Comorbidities are very common in ADHD and may present with overlapping symptoms or symptoms that mask features of ADHD. However, comorbidities can also intensify ADHD symptoms leading to decreased functioning. As discussed in Part 1 of our podcast series, common comorbidities include: disruptive behaviour disorders (like ODD and CD), anxiety disorders, obsessive compulsive disorders, mood disorders, substance use disorders, tic disorders, developmental coordination disorders, specific learning disorders and eating disorders. In this podcast, we will focus on some of the conditions that have ADHD as a comorbidity. These are autism, intellectual disabilities and premature births. We will discuss how overlapping features of certain disorders may delay diagnosis.

Autism Spectrum Disorder:

The first comorbid condition we will discuss is autism spectrum disorder or ASD. More than 50% of children with autism meet diagnostic criteria for ADHD and up to 50% of children with ADHD have autistic traits. You may ask why ASD and ADHD are often found together? The answer has to do with similar genetic abnormalities between the disorders. As well, certain genetic syndromes, such as Fragile X syndrome, tuberous sclerosis, 22q11 deletion, and Williams syndrome, exhibit clinical signs of ASD and ADHD.

It may be difficult to diagnose ADHD in a child with ASD as their presentations are often similar. For example, both disorders can present with inattention, impulsivity and hyperactivity, which are more ADHD-like traits. However, they can also present with impairment in social functioning which is more of an ASD trait. Other similarities include male predominance, early onset age of behaviours, and high heritability with other psychiatric, development and neurological disorders. More commonly, children with both ASD and ADHD are diagnosed with ADHD first. This often means it could take many years for them to receive their ASD diagnosis compared to those that are diagnosed concurrently.

Children who have both disorders often have more pronounced impairments compared to those with only one of the disorders. For example, they may have greater issues with social skills, independent functioning, executive functioning, disruptive behaviour, and language skills. They show more stereotypic or repetitive behaviour, such as pacing, rocking and flapping. Psychiatric disorders such as depression, anxiety and tic disorders are also more common.

In terms of treatment, what is the best approach?

The best approach for these individuals is a combination of both pharmacologic and non-pharmacologic interventions. Before starting any pharmacologic therapy, non-pharmacologic interventions must be initiated. These include parent and teacher training, individualized education plans and academic supports at school. Children with ASD also benefit from early intense behavioural interventions, such as applied behavioural analysis or ABA. As well, not only is physical activity good for a child's cardiovascular health, flexibility and overall growth and development, it has been shown to alleviate ADHD symptoms and improve social functioning in those with ASD!

Medications are often necessary to help combat the child's ADHD symptoms. Psychostimulants are still first-line and the same ADHD treatment algorithm is used for these patients. For more information about psychostimulant treatment, please refer to Part 2 of our podcast series. Although benefits are seen in some patients, this population is more likely to be non-responders and have medication side effects. The most common side effect of stimulants in this population is irritability with emotional outbursts. Others include: increase stereotypic behaviours, agitation and psychotic symptoms. Another medication used at times in ADHD is Atomoxetine, a non-stimulant. However, the few studies available have suggested a positive response, showing improvement in symptoms but it does require a longer time period to see its full response. For those with other psychiatric comorbidities in addition to ASD and ADHD, use of adjunct medications such as antidepressants or antipsychotics, are indicated.

As these patients are often quite complex, they often need referrals to centers that have knowledge in a variety of disorders and are able to provide regular multi-disciplinary assessments and follow-up.

Intellectual Disability:

Intellectual disability or ID, is a neurodevelopmental disorder characterized by a lack of cognitive functioning, in academic and non-academic settings. This can be seen as deficits in skills such as problem-solving, judgement and abstract thinking, as well as below average IQ scores. Altogether, this leads the child to be unable to meet society's norms for independence and social responsibility. ID can also affect the outcomes of other comorbid developmental and mental health disorders. Similar to autism and ADHD, ID and ADHD may have a genetic etiology.

This is relevant to us, as ADHD is the most common comorbid neurodevelopmental disorder with ID. ADHD is more prevalent in this population than the general population! However, diagnosing ADHD in ID is often difficult due to overlapping symptoms between the disorders.

ADHD diagnosis may be missed if it is assumed that inattention and behavioural symptoms are only due to the ID. The DSM-5 states that a diagnosis of ADHD in ID can only be made when the core symptoms of ADHD *are* excessive for developmental age and occur in two or more settings. So, let's say a child presents to your office with

an ID and inattention and hyperactivity at school when their school work exceeds their intellectual level. However, their symptoms disappear in non-academic settings. This would not be a diagnosis of ADHD as the core symptoms are not present in two or more settings.

There are currently no standardized questionnaires to diagnose ADHD in this population. Therefore, to accurately ensure that symptoms of inattention and hyperactivity are due to comorbid ADHD in a child with ID, a multidisciplinary diagnostic approach must be used.

In ID with comorbid ADHD, the main ADHD symptoms are generally more severe and less likely to decrease with age. These children commonly have more agitation, aggression, self-injurious behaviours, stereotypic behaviours like arm flapping, and issues with conduct. Children with ID and ADHD often struggle more with communication and social and daily living skills.

In terms of treatment options, both non-pharmacologic and pharmacologic can be used. Social and behavioural interventions are important and may lead to a lower dose and less side effects of medications prescribed. These interventions must target both the child's cognitive and emotional needs, in school and non-school settings. Examples of these include the use of assistive technologies to help with communication, modifications of the classroom specific to child's individual needs, and reinforcement of positive or desired behaviours. As we discussed in parts 2 of this podcast series, exercise is also important!

If medications are needed, psychostimulants are still first-line. However, studies show less benefit from stimulants in this population than in those with ADHD alone. Better response rates are seen in those with higher IQ levels. As well, side effects of the stimulants, such as tics and social withdrawal, are more common in children with ID and ADHD compared to those without an ID.

If a child receives psychostimulants and psychotherapy but is still experiencing symptoms, other medications can be tried. The first group is nonstimulants, which includes Atomoxetine, Guanfacine and Clonidine[1]. In contrast to psychostimulants, there is much less evidence for the use of these medications. Depending on the nonstimulant, and the child's response to it, they may be used as monotherapy or in combination with a stimulant[1]. If the child is still experiencing symptoms that disrupt their daily functioning, especially aggressive behaviours, antipyschotics, such as Risperidone, may be tried[1]. It is very important to watch for side effects from the antipsychotics, such as weight grain and extrapyramidal symptoms.

Prematurity:

The last major category we will discuss today is prematurity and ADHD. Prematurity is associated with a wide range of medical conditions due to the earlier gestational age

and lower birth rates. Examples relevant to us include cognitive impairment, and neurodevelopmental and mental health disorders. Almost 50% of children born before 26 weeks or those less than 1000g at birth have developmental disorders. Studies show that, on average, as gestational age increases, cognitive impairment decreases. These children often require extra supports at school.

School age children born before 30 weeks or with a low birth weight, less than 1500g, often have more behavioural problems than those born at normal weight and term. These behaviours are often called the "preterm behavioural phenotype" and consist of symptoms such as inattention, anxiety, depression, withdrawal, somatic complaints, and social difficulties. The hyperactive/impulsive symptoms of ADHD and disruptive behaviours are seen less often. For example, a birth cohort study of extremely low birth weight, which is less than 1000g, and extremely premature, less than 26 weeks gestation, showed that at kindergarten twice as many met criteria for combined inattention-hyperactive-impulsive ADHD and five times as many for inattentive ADHD presentation, compared to those of normal birth weight. As the children age, similar results are seen with inattentive presentation, and social and anxiety problems persisting. However, interestingly, even as they age, these children often do not have comorbid oppositional defiant disorder, conduct disorder or disruptive behaviours of ADHD. Studies have shown that children who were later preterm, 34 to 37 weeks gestational age, have similar incidence of ADHD compared to term infants. Therefore, the more premature the child is the higher risk of having ADHD or associated symptoms.

Knowing all this information, what is the best management strategy?

Many provinces and territories in Canada have programs that monitor the development of preterm babies till at least 2 years of age. For example, babies who are in the NICU will go to a NICU follow-up clinic every few months. However, most institutions do not monitor these children at school age, which is when their symptoms are most likely to impair function. Therefore, more monitoring is needed in school-aged children to ensure that medications, supports and services are put in place, and other comorbid behavioural disorders are identified, in a timely manner. If medications are needed, the same practices are used as for those born at term.

This brings us to the end of the third podcast in our ADHD series - ADHD in children and youth: Part 3—Assessment and treatment with comorbid ASD, ID, or prematurity.

Let's review what we learned:

1. Children with ASD, ID and born prematurely are at increased risk for ADHD. Therefore, it is especially important that ADHD is screened for and monitored in these populations. Because ADHD symptoms are quite prevalent in the

academic setting, clinicians must follow these children until they begin school to ensure that there are no ongoing issues.

2. In these populations, diagnosis requires a multidisciplinary approach and ongoing assessment of other behavioural disorders. Diagnosis is often difficult, and may be delayed, as symptoms may overlap between the ASD or ID and ADHD.
3. Those with comorbid ASD or ID tend to have more pronounced impairments in functioning.
4. In children with comorbid ADHD and ASD or ID, the treatment approach should include non-pharmacologic and pharmacologic interventions, if indicated. Examples of non-pharmacologic interventions include exercise, classroom or academic strategies, behavioural interventions, and applied behavioural analysis in autism.
5. If medications are needed, psychostimulants are first-line. However, side effects are more common in children with ASD and ID.

Thanks for listening! We hope you found this podcast series helpful in understanding and managing ADHD.

References:

1. Clark B, Bélanger SA. ADHD in children and youth: Part 3—Assessment and treatment with comorbid ASD, ID, or prematurity. Paediatr Child Health. 2018 Oct 24; 23(7):485–490.
2. Gorman DA, Gardner DM, Murphy AL, et al. Canadian guidelines on pharmacotherapy for disruptive and aggressive behaviour in children and adolescents with attention-deficit hyperactivity disorder, oppositional defiant disorder, or conduct disorder. *Can J Psychiatry*. 2015 Feb;60(2):62-76.

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