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Specific Learning Disorders

Developed by Liane Kang and Dr. Sonnenberg for PedsCases.com.

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Introduction:

Liane: Hello everyone, thank you for listening to this podcast. My name is Liane Kang, and I am a third year medical student at the University of Alberta. This podcast has been made under the guidance of Dr. Lyn Sonnenberg, a neurodevelopmental pediatrician from the Glenrose Rehabilitation Hospital in Edmonton, Alberta. Hello, Dr. Sonnenberg. Thank you for joining us!

Dr. Sonnenberg: Hello!

Liane: Today we will be discussing specific learning disorders or SLD, with a focus on impairments in reading, more commonly known as Dyslexia. After listening to this podcast, you will be able to...

1. Differentiate between intellectual disability and specific learning disorders
2. Define Dyslexia or specific learning disorder with impairment in reading
3. Develop a differential diagnosis for a child who has difficulties with reading
4. Outline the approaches to screening and management for a child with an SLD in reading
5. Discuss the modifications needed for society to assist those with an SLD in reading

Clinical Case:

Dr. Sonnenberg: Sounds exciting, so let's start with a case!

Alexa is a seven-year-old girl who has difficulties with reading. She knows a few words from repetition, but does not seem to be able to sound out new words. Alexa, who was once looking forward to reading her favourite books about animals, becomes very frustrated whenever she has to do her reading homework. Her Gr. 1 teacher notes that Alexa is an excellent and polite student but appears to be struggling with reading exercises and spelling tests. Her parents wonder if Alexa just needs more time learning how to read and would like to know which supports will be required for Alexa to get better at reading.

Background and Definitions:

Liane: Dr. Sonnenberg, I know that Intellectual Disability is diagnosed when children during the developmental period have deficits in intellectual functioning¹, but how does this differ from a specific learning disorder?

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Dr. Sonnenberg: A specific learning disorder (SLD), according to the DSM-5, is a selective impairment in reading, mathematics, or writing, but the child will have average or even above average intelligence¹.

Liane: I would like to learn more about Dyslexia. It seems that it has been renamed to be a specific learning disorder with impairments in reading under the DSM-5, but it seems most people still call it Dyslexia. So what is Dyslexia?

Dr. Sonnenberg: The International Dyslexia Association defines Dyslexia as “... a specific learning disability or SLD, that is neurological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and can also include poor spelling and decoding skills².” An SLD with impairment in reading can include poor decoding or word recognition, which is Dyslexia, but it also includes poor reading comprehension and reading rate¹. In America, approximately one in five children have Dyslexia so it is the most common learning disorder, and this disorder persists throughout an individual’s whole life³.

Liane: So it seems that individuals with Dyslexia have difficulty with recognizing sounds of letters and phonemes, which are units of sound in the words of a language. It’s not just about reversing letters or mixing up numbers.

Dr. Sonnenberg: Correct! Research shows that there is a disruption in the left hemisphere where there are posterior reading systems and there is an increased activation of the frontal regions of the brain, which leads to deficits in phonological awareness³.

So, here’s a question for you, Liane! When seeing a child who is struggling with reading, what comes to mind for your differential diagnosis?

Approach to Assessment:

Liane: There could be vision or hearing impairments; the child may be fatigued and there could be an underlying condition like sleep apnea or hypothyroidism⁴. A child may not be able to focus well because of poor nutrition or mood disorders. Perhaps the learning environment or social disadvantages are preventing the child from being able to learn how to read.

Dr. Sonnenberg: Exactly! I might also add that there could be some genetic syndromes, such as Neurofibromatosis Type I or 22q Deletion Syndrome. As well, there may be some neurological conditions, such as absence seizures or tumours, that might present as a reading problem.

Liane: What are some features that might identify a child with SLD in reading? Are these children most often identified when they are just learning letters or learning how to read?

Dr. Sonnenberg: It would be age dependent, but most children aren’t identified until it is rather late in the learning game. Some don’t get diagnosed until high school or university, but there are early signs. If the child is in preschool, they may not be able to learn nursery rhymes or pronounce words or remember letters³. For children who are in Kindergarten or in Gr. 1, if they have SLD in reading, they may not be able to learn letters or be able to read words³. As these children get older, they will have difficulty in school because most of the

learning that is done relies on reading, and they might try to avoid reading³. Because they have average intelligence, they can compensate by listening carefully and memorizing familiar stories, so it appears they are reading.

Liane: And they may have difficulty building their vocabulary. So would they have difficulty retrieving words to say?

Dr. Sonnenberg: That is right. As they get older, if they are not provided with the early intervention, they will fall even further behind than their peers. It is important to find these children who have SLD in reading early so that timely interventions and supports are provided. Even with supports, their reading pathways are different, so it is always going to take them longer to decode words. Think of it as driving from one city to another. It is faster to take the highway. For these children, that road is closed, so they need to take alternative learning routes through the brain, which take longer. This also takes more effort and can be exhausting for children.

Liane: Is there screening for SLDs?

Dr. Sonnenberg: In the US and in Europe, some schools have implemented selective screening for children with reading problems³. Dr. Shannon Shaywitz has developed a screening tool that is used by teachers who teach Kindergarten to Gr. 3, where they are able to identify which child might have high risk for Dyslexia. Unfortunately, here in Canada, we do not have guidelines for early selective screening⁶. It is important to detect reading problems early in a child's studies so that support is provided to help the child learn how to read, preventing the child from not spending so many years struggling with school³. Being able to identify the SLD early, also helps with developing self-esteem, which is important as the child reaches adolescence⁴.

Liane: How are children assessed for a learning disorder in reading? Are there any tools that could be used to help?

Dr. Sonnenberg: The child's teacher may bring up the reading problem to the parents. It is important to get the teachers and parents involved because SLD in reading requires a clinical diagnosis. A family physician or general pediatrician could listen to the child read aloud and check for fluency and understanding⁵. The Comprehensive Test of Phonological Processing, Woodcock Johnson IV, and Woodcock Reading Mastery Test are some of the psychometric tests that can be used to assess a child with a reading problem⁵.

Liane: Since SLD in reading requires a clinical diagnosis, we would probably look for risk factors or comorbidities, such as ADHD or chronic otitis media, on history and physical examination. We could also get the child to get their vision and hearing checked. Are there any other investigations we could do?

Dr. Sonnenberg: The gold standard is psychoeducational testing to compare their IQ and scholastic abilities. This testing is done by an educational psychologist, either arranged through the school or paid for privately by caregivers, as the school wait time is, unfortunately, usually years in length. Genetic testing might be indicated if there are physical exam findings, such as axillary freckling and café au lait macules, in keeping with

Neurofibromatosis Type 1. Labs and imaging would only be required if there were specific indications⁵.

Management:

Liane: Once we get a diagnosis of SLD in reading, I assume we would refer to Developmental Pediatrics?

Dr. Sonnenberg: Not always. The psychologist often takes care of the testing and recommendations for the caregivers and school. Learning disorders can have comorbidities that need to be managed as well, such as ADHD, depression or anxiety⁴. Most general pediatricians are able to support children and families through this process. Many can help advocate and work with the special education programs at schools to ensure the child is provided with enough support with their learning in each level of education. Sometimes the student might have to switch schools to find specialized support programs as not all schools are fully equipped to help the child with an SLD in reading³. There are programs for phonemic awareness that could help a child with Dyslexia to learn how to recognize phonemes when reading⁵. In Edmonton, we have the Centre for Literacy, which is a private program that helps students with learning disabilities in reading, writing, and math.

Liane: I know that universities provide accommodations for students and learning specialists who can provide some study and exam-taking strategies. Here at the University of Alberta, student volunteers take notes for those who are not able to take notes during lecture.

Dr. Sonnenberg: Yes, students with SLD in reading may find having accommodations, such as extra time for tests (because remember the brain takes a longer route to decode the information read). Lecture recordings, audiobooks or alternative testing formats can also be helpful as they pursue their postsecondary education³. As you can see, the management of Dyslexia occurs across a lifespan and requires the help of parents, schools, psychologists and health professionals.

Modifications needed for Society and Medical Practice:

Liane: It's amazing that there are some well-known individuals, such as Jennifer Aniston, Steven Spielberg or Kiera Knightley, who have produced great works despite having a learning disorder in reading.

Dr. Sonnenberg: There are even physicians who have impairments in reading and you would never know. It is really a hidden disorder, which is the reason that universal accommodations that benefit everyone should always be the goal.

Liane: It seems an SLD in reading has a lifelong impact on the lives of those who have it. Are there any modifications needed for society to support those with a learning disorder in reading?

Dr. Sonnenberg: Remember that a specific learning disorder does not mean lesser intelligence! Individuals who have SLDs can still be high-functioning and reach their potential if they are provided with a supportive learning environment⁵. What do you think could be done?

Liane: Perhaps schools could provide even more accommodations for students with SLDs. There could be more technological support, such as dictation devices or text to speech apps, which would make learning less laborious for the student. Courses could also provide more content in visuals rather than print to help those with an SLD in reading to get a better understanding of what is being taught³.

Dr. Sonnenberg: Definitely! I hope some of these accommodations will be provided in the doctor's office as well! Physicians provide many detailed written instructions for prescriptions or for tests and imaging. If we could provide audio links or incorporate the use of visuals into these instructions, I am sure this would be helpful everyone, not just for those who have learning disorders in reading.

Case Review:

Liane: Now let's go back to Alexa. It seems Alexa is struggling with learning new words, and this is preventing her from being able to do her reading and spelling exercises in school. We would first check her vision and hearing and also rule out other causes of her troubles with reading, such as sleep apnea or nutritional deficiencies. We can ask Alexa to read to us to see if there are issues sounding out words or understanding the words that are read. We would work with educational psychologists, teachers, special education programs, and her caregivers to ensure that adequate support for learning is provided to Alexa, such as reading programs, school accommodations, and management of comorbid conditions.

Dr. Sonnenberg: Correct! We want to provide Alexa with support and resources early so that she is able to continue learning in school. It is most important that she knows that she is smart and that her brain is working even harder than other children and to keep at!

Summary:

Liane: To summarize, here are the main learning points:

- Specific Learning Disorders differ from Intellectual Disability because individuals with Learning Disorders can have average or above average intelligence.
- An SLD in reading is often called Dyslexia. Dyslexia is an impairment in phonological awareness, which leads to difficulties in reading.
- History and psychoeducational testing are the gold standard and are essential in diagnosing an SLD in reading.
- Management requires a multidisciplinary approach involving caregivers, teachers, psychologists, and pediatricians so that children with an SLD in reading are provided with support in learning how to read and have accommodations for their learning.
- Early selective screening and early interventions are needed so that students with SLDs are able to reach their full potential in learning.

This concludes our podcast. Thank you Dr. Sonnenberg for your time and for sharing your expertise! And thank you to the listeners for joining us in this podcast on Specific Learning Disorders.

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