

The clinical challenge of dual diagnoses: Autism spectrum disorder plus either auditory neuropathy or sensorineural hearing loss

Background

When Autism spectrum disorder (ASD) and an auditory disorder co-exist in a child, the clinician is doubly challenged to distinguish the relative contribution of each component to the child's developmental behaviors for listening and language. To develop an appropriate plan of intervention, both parts of the dual diagnoses must be accurately specified. Hearing loss and ASD have very similar behavioral presentations in early childhood and can interfere with habilitative and therapeutic efforts. This poster presentation will discuss the collaborative diagnostic elements necessary to establish a dual diagnosis of ASD and either sensorineural hearing loss or auditory neuropathy. It will also discuss how audiologists and other early intervention providers must collaborate to identify respective signs and symptoms. A combination of physiological and behavioral measures, the child's reactions and responses to auditory amplification, and developmental monitoring are together essential for accurate diagnoses. The intervention approach to dual-diagnosis children must be individualized based on the relative contribution of the autism component versus the auditory disorder component. This poster will discuss the necessity of an interdisciplinary team and the timelines, based on our clinical experience, of when an accurate diagnosis may be established.

Key Facts

- Hearing loss identification is typically made prior to ASD diagnosis due to EHDI early intervention guidelines and the developmental nature of ASD
- If unexpected behaviors are observed early suspicion of a co-existing diagnosis can be aroused early
- Auditory neuropathy (ANSD) is relatively straightforward to diagnose. While the auditory problem is significant the characteristics are elusive
- Demonstration of auditory, oral, behavioral developmental behaviors, with therapeutic intervention, may be non-repeatable within session and may display poor test-retest reliability in children with ANSD making additional diagnosis particularly difficult.

Aim & Objectives

The aim of this poster session will be to discuss the clinically observed behaviors and challenges of combined diagnoses of sensorineural hearing loss and ASD and auditory neuropathy and ASD. We seek to achieve the following learning objectives:

- Identify in a timely manner ASD behaviors that interfere with developmental auditory listening, receptive language, and expressive language behaviors.
- Organize an interdisciplinary team to complement hearing services in the identification and intervention of ASD in children with auditory disorders.
- Discuss the differences in challenges, behaviors and strategies for a child with a diagnosis of ASD with sensorineural hearing loss versus a child with auditory neuropathy.

Age of Identification

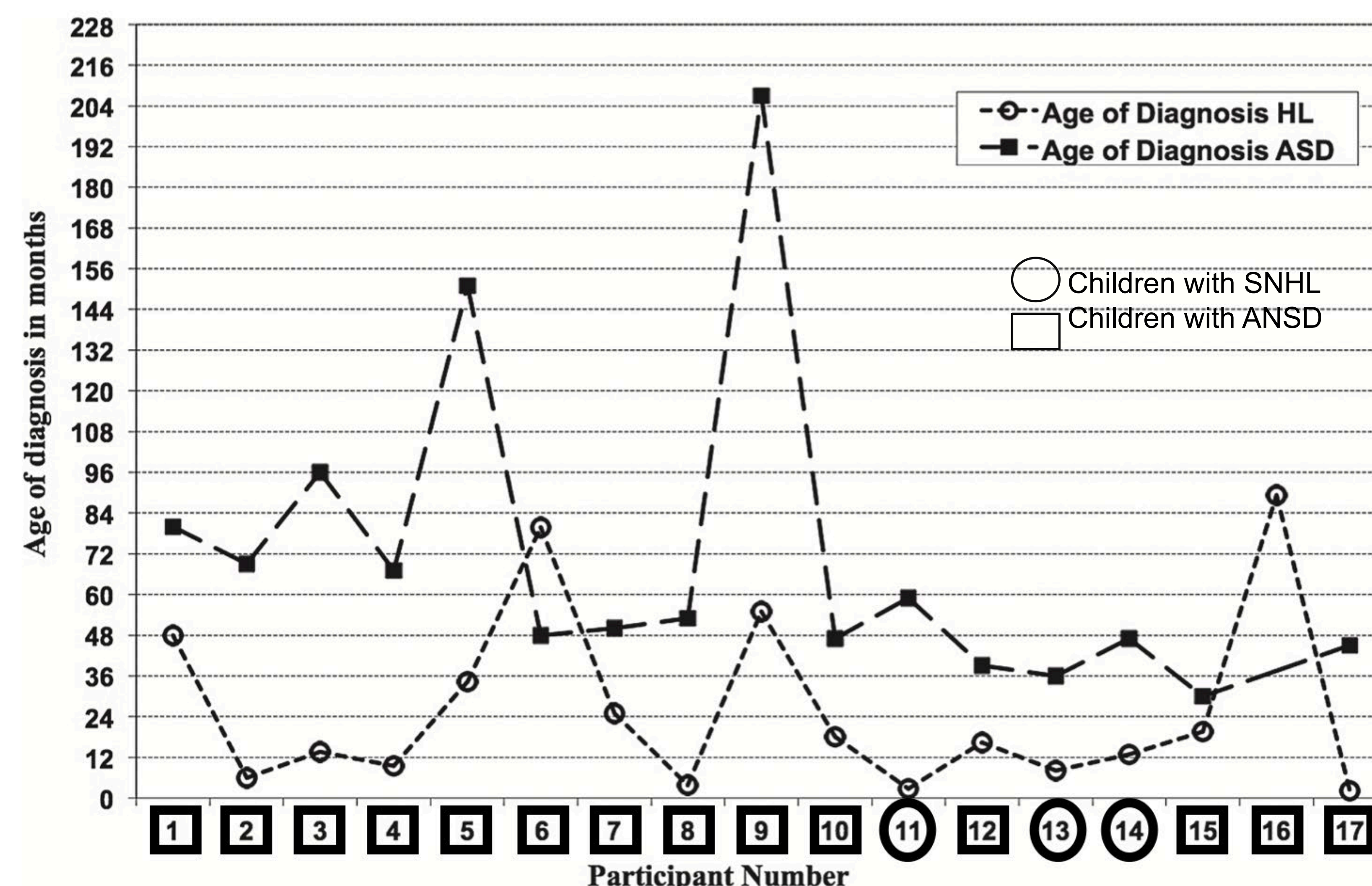


Figure 1.1 Compares age of hearing loss diagnosis to ASD diagnosis in month's

Where does hearing loss & ANSD end, and ASD begin relative to intervention?

The goal of this poster is to one day have a complete answer to this question. What is clear is that when a child carries a dual diagnosis intervention should be viewed on a spectrum, with one end focused on ASD therapy and intervention and the other on aural rehabilitation. At different periods in everyone's life, aspects along the spectrum of interventions will be used in different manners to best support the child, but it is necessary to identify where the diagnoses converge to better serve these individuals. Further investigation into the development and timely identification of the auditory listening skills, receptive and expressive language and social behaviors will help answer this question.

Observed Behaviors in the ASD & SNHL/ANSD Child

I. Key Behaviors noted by clinical Observation and Szarkowski et al., 2014, Ludwig et al., 2022

- Echolalia*
- Not responding to one's name with amplification or with culturally appropriate attention getting measures *
- Delay in Theory of mind or the ability to express mental status*
- Reduced/absent social smile**
- Lack of pointing for shared enjoyment **
- Using others as objects (hands as tools) *
- Gaps in acquisition of language beyond expected with intervention**
- Unusual social overtures towards others**
- Transitions are rigid and difficult*
- No increase in vocalizations with amplification*
- Sporadic or inconsistent responses to environmental sounds with amplification*
- Symbolic play skills are inconsistent with nonverbal IQ**
- Sign palm rotation errors (sign echolalia behavior)**
- Rocking, twirling, flapping, spinning **
- Play is rigid and unimaginative*
- Limited give/show behavior**
- Difficulties with joint attention with practice*
- Absent preverbal communication skills*
- Overall regression**

*Either ASD or ANSD behaviors

** ASD behaviors

Strategies

- Consider provisional ASD diagnosis to access services if supported by early diagnostics and observations ⁴
- Increased monitoring of ANSD to measure behavioral responses to sound ³
- Use of Sign Language ²
- LENA or BISCUT as screening tools to track behavior in suspected ASD cases
- Use of ADOS-2 or comparable tool when assessing D/deaf children with consideration for ASL use ⁴

Assembling the Multi-Disciplinary Team

Diagnostic Team

- Developmental Pediatrician ^{2,7,8}
- Neurologist ⁵
- Pediatric Audiologist ^{2,7,8}
- Psychologist
- Speech-Language Pathologist ^{7,8}
- Educational Specialist ³
- Social Worker
- Occupational Therapist
- Physical Therapist

Intervention & Monitoring Team ⁴

- Pediatric Audiologist ^{2,7,8}
- Developmental Pediatrician/Pediatrician ^{2,7,8}
- Speech-Language Pathologist ^{7,8}
- Occupational Therapist*
- Physical Therapist*
- Applied Behavioral Analyst*
- Social Worker

***as needed per each child's needs

Future Considerations & Clinical Implications

- Consider increased monitoring of hearing and behavior in children with birth, genetic, or developmental risk factors for hearing loss or ASD ^{6,7}
- Consider developing specialty clinics with participation of key disciplines like Audiology with Neurology and Psychology to combat potential delays in obtaining the dual diagnosis. This could also lessen the burden on families attending multiple appointments and wait times
- Create strong clinical connections among various specialties and ensure ongoing communication via a social worker or clinical case manager to coordinate care and monitor development
- More longitudinal research with the ASD and ANSD population that factors in the demonstration of auditory, oral, and behavioral developmental behaviors, with therapeutic intervention
- Use if alternative testing stimulus like filtered songs, pulsed narrow bands of noise or pediatric noise that have wider bandwidths to recruit more neural auditory fibers in children with ANSD and facilitate behavioral responses. It is essential that the acoustic characteristics of the alternative stimuli or method is well-defined and completely understood prior to use
- Determine whether greater hearing loss will facilitate earlier diagnosis of ASD in children who have the dual diagnosis ²
- Need for validation of ADOS-2 in children who have either SNHL or ANSD diagnoses.

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