Speech Language Disorders of

ASXL3 gene mutation/Bainbridge-Ropers Syndrome

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Bainbridge-Ropers Syndrome (BRS) is a mutation of the ASXL3 gene that causes developmental delay, intellectual disability, feeding problems, growth retardation, craniofacial abnormalities, psychomotor retardation, and in some cases autism (Bainbridge et al., 2013; Ropers & Wienker, 2015; Hamosh, 2013). BRS requires a clinical diagnosis through the sequencing of an individual's entire genome through whole-exome sequencing. In 2013 Bainbridge et al. identified de novo nonsense mutations in the ASXL3 gene in each of the four patients that participated in the study. Through subsequent studies, the mutation has been confirmed to be de novo, a spontaneous and random mutation that was not inherited from either parent (Dinwiddie et al., 2013; Hori et al., 2016; Srivastava et al., 2015).

The following information on the phenotypes, or observable characteristics, was created by a group parents whose children have been diagnosed with BRS. Although this list was not compiled by researchers in an official capacity, it presents qualitative case information of potential features of the disorder. Clinicians who have a child with BRS on their caseloads should be aware of these phenotypes and how they impact intervention decisions and implementation.

Phenotypes	Majority	Approx. Half	Minority
Physical Features	Hypotonia, overbite (prominent upper teeth), short nose with anteverted nares (nostrils end lower than the tip of the nose), high forehead, low set ears, poor fine and gross motor skills, restricted mobility	Lower than average weight/height, high arched palate, deep palm creases, collapsed foot arch, non-ambulatory	
Behaviors	Stereotypic behaviors (hand flapping and head shaking), sleep issues (difficulty falling asleep, sleep apnea, night terrors), inappropriate/ compulsive laughter, frequent tantrums	Self-harming behaviors, bruxism	
Cognitive/Social/ Emotional	Intellectual disability, childhood apraxia of speech, developmental delay, require assistance for all areas of daily living, short attention span, poor peer relationships, poor eye contact, an intense fascination with water	Clinical diagnosis of autism spectrum disorder	
Medical Conditions	Feeding difficulties, dysphagia**,** sensory sensitivity	Acid reflux (often treated with Nissen fundoplication), feeding tube placement, strabismus, vision problems, frequent upper respiratory infections (adenoids and tonsils often removed), constipation, frequent ear infections (PE tube placement), high pain tolerance, failure to thrive at birth, microcephaly, early onset puberty	Seizures, rarely produce tears, tracheostomy

Children with BRS have severe deficits in all areas of communication. Most of the children have been diagnosed with childhood apraxia of speech and almost all of the approximately 100 children that participate in the online support group, are nonverbal (>10 limited speech abilities). The craniofacial features, poor motor control and high arched palate make speech production and articulation extremely difficult. Many families have reported attempts to implement sign language but the children's poor fine motor skills make sign language difficult as well. Some parents and caregivers have successfully taught their children some adaptive signs unique to their child. Many families have reported that their child is unable to retain a large amount of signs. It is common for some of the children to lose a previously learned sign when learning a new one.

BRS causes severe deficits in the area of language. Because the children are nonverbal, expressive language assessments relying on verbal responses can not be administered. Intellectual disabilities create cognitive constraints that also inhibit expressive and receptive language. Most children with BRS have higher receptive abilities than expressive abilities. This is reflected in nonverbal assessment scores given to some of the children in schools and by SLPs in private practice, as reported by parents. Assessments that rely on pointing to show comprehension can be administered to higher functioning individuals with BRS. Short attention spans can make assessments difficult for children with BRS and clinicians should plan accordingly during diagnostic sessions.

Augmentative and alternative communication methods have been successfully implemented with some of the children who have BRS. The use of core communication boards,

picture exchange communication, and speech generating devices are used successfully by some of the children both with and without the assistance of a speech-language pathologist.

References

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