Medical and physical health in children with intellectual disability of genetic aetiology with and without Autism Spectrum Disorder

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Background

- IMAGINE-ID is a UK national cohort study of over 3000 children and adolescents with intellectual disability (ID) of known genetic origin, comprising of a wide range of copy-number and single-nucleotide variants (CNV/SNV).
- Children with ID of genomic origin have an excess of physical health problems.
- This study aimed to assess the quality and severity of medical complications in the subgroup with co-occurring Autism Spectrum Disorder (ASD).

Aims

1) To examine the range and frequency of physical health outcomes in children with moderate to severe ID, contrasting those with and without co-occurring ASD.
2) To compare the physical health outcomes of IMAGINE-ID children whose condition was due to a CNV with those in whom the aetiology was an SNV.

Methods

Data were available for 209 participants aged 4-18 years (mean 9.36, SD 4) recruited through Regional Genetic Centers. Caregivers completed validated assessments online, over the phone or in person:

- Development and Wellbeing Assessment (DAWBA): Structured psychiatric interview based on DSM-5. Diagnoses of ASD made by clinician review, with high reliability.
- Structured Medical Questionnaire: A record of medical history, current physical health and developmental history were available for all participants.
- ASD: 44.5% met diagnostic criteria for ASD, 62.4% of whom were male (53.4% of non-ASD cohort were male).
- No significant group differences in chronological, developmental or language age between those with and without ASD.

Results

Aim 1)

In the IMAGINE-ID cohort with ASD, sleep, feeding/eating, and gastrointestinal problems were more frequently reported compared to those without co-occurring ASD.

Aim 2)

62.2% of IMAGINE-ID cohort had a pathogenic CNV and 37.8% a pathogenic SNV.

ASD: proportion with ASD in SNV carriers (49%) is similar to CNV carriers (43%) (p>0.05.)

Seizures: associated with SNV 39%/ CNV 19% p=.005

Vision: deficits in SNV 66%/CNV 50% p=0.024

Motor skills: deficits in SNV 79%/CNV 57% p=0.003

Genital: abnormalities in SNV 23%/CNV 12% p=0.025

Skeletal: abnormalities in SNV 30%/CNV 15% p=0.04

Findings

Children whose ID of genetic origin is associated with ASD are at much higher risk of gastrointestinal problems, disturbed sleep patterns and eating difficulties than those without associated ASD.

Children whose ID of genetic origin is due to SNV have twice the risk of developing seizures compared to those with pathogenic CNV.

In general, a higher proportion of pathogenic SNV than CNV is found in association with 'idiopathic' epilepsy.1

Pathogenic SNV that are detected in children with ID are strongly associated with disordered physical development including motor difficulties, skeletal and genital abnormalities.

References