ADHD, learning difficulties and sleep disturbances associated with KCNJ11-related neonatal diabetes.

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Abstract

OBJECTIVES:
Mutation
s in KCNJ11 are the most common cause of permanent neonatal diabetes mellitus (NDM). Approximately 25% of patients have obvious neurological dysfunction, but whether milder related problems might be more common has been unclear. We sought to assess the prevalence of parental concerns about learning, behavior, attention deficit hyperactivity disorder (ADHD), social competency, and sleep in subjects with KCNJ11-related NDM compared to unaffected sibling controls.

STUDY DESIGN:
Subjects or their guardians in the University of Chicago Monogenic Diabetes Registry completed a survey examining learning, behavior, ADHD and sleep. Thirty subjects with KCNJ11-related NDM and 25 unaffected sibling controls were assessed. Data were analyzed using GraphPad Prism 6. Nonparametric analysis was performed using Fisher's exact test for group comparisons.

RESULTS:
Thirteen (43%) individuals with KCNJ11-related NDM had treatment for or a diagnosis of ADHD compared to two (8%) of the sibling controls (P < 0.05). Compared to their sibling controls, individuals with KCNJ11 mutations had significant differences in behavior difficulties, social awareness, academic achievement and the need for an Individualized Education Plan (IEP). As seen in other neurodevelopmental disorders, individuals with KCNJ11 mutations also had significantly higher rates of sleep difficulties (P < 0.01).

CONCLUSION:
Patients with KCNJ11-related NDM are at an increased risk for delays in learning, social-emotional and behavioral development, ADHD and sleep difficulties based on parent report. Early identification, along with integrated medical and developmental support, may promote better neurodevelopmental outcomes for this unique population. Further investigation utilizing detailed neuropsychological testing will better define the neurodevelopmental consequences of KATP mutations.