

2007 and 2018, the prevalence of diabetes among Korean adolescents increased. Further studies are required to determine the causes of these increases.

Pediatric Endocrinology

DIABETES, INSULIN, AND LIPIDS IN PEDIATRIC ENDOCRINOLOGY

Youth With Type 1 Diabetes Experienced a Higher Level of Anxiety During the COVID-19 Pandemic Compared to Healthy Control; A Cross-Sectional Study

Caroline Wade, BA, Leah akinseye, MD, Tachele Anderson, BA, Thresa Borky, BA, Grace Nelson, MD, rahul peravali, BA, Jamila Smith-young, DNP, Caitlin Witt, BA, Ahlee Kim, MD. LE BONHEUR CHILDRENS Medical Center, Memphis, TN, USA.

Background and Aims: Diabetes is highly associated with depression and anxiety. With the coronavirus disease 2019 (COVID-19) pandemic, the prevalence of mental health issues in the general population appears to be increasing rapidly (1). Thus, we evaluated psychological health in pediatric type 1 diabetes (T1D) patients and caregivers during the lockdown phase of the COVID-19 pandemic. Our objective was to compare the levels of depression and anxiety in youth with T1D and their caregivers to those of healthy controls. We hypothesized that youth with T1D would experience higher levels of depression and anxiety than healthy controls during the COVID-19 pandemic (Aim 1). We also explored potential causes of increased depression/anxiety in T1D (Aim 2). We aimed to further understand psychosocial well-being in T1D during the COVID-19 pandemic and identify mechanisms to support this population in global crises. **Methods:** A week after the start of Tennessee's shelter-in-place order, we performed 15-minute phone surveys to screen for anxiety and depression in families with children with T1D (n=100, mean age of children=13.8 years, mean HbA1c=8.95%, Race=Caucasian (55%/African American (43%)) and healthy children (mean age of children=5.7 years, Race=Caucasian (24%/African American (69%)). Depression and anxiety were assessed by a standard assessment tool, the Patient Health Questionnaire (PHQ-4), a 4-item inventory rated on a 4-point Likert scale that briefly assesses depression and anxiety. Anxiety/depression-related variables were compared based on T1D status using the Chi-square test or t-test, as appropriate. The association between T1D and risk of anxiety and depression was examined using logistic regression adjusted for potential confounders. For families with T1D, additional questions were administered to identify specific concerns associated with T1D care. **Results:** Compared to controls, T1D was associated with a five times higher risk of anxiety in multivariable adjusted models, OR=5.02 (95% confidence interval: 1.83, 14.84), $P=0.002$. Additionally, 26/52 T1D families (50%) had significant concern for being at a higher risk for severe COVID-19 infection due to T1D and 14/52 T1D families (27%) were worried about obtaining insulin and diabetes supplies. **Conclusions:** Pediatric T1D is associated with an increased risk of anxiety but not depression in the acute phase of the COVID-19 pandemic. Elevated anxiety in T1D during the COVID-19 pandemic

appears to be, at least in part, due to fear of higher risk of severe COVID-19 infection and uncertainty regarding access to insulin and diabetes supplies. Further studies to address mental health in T1D during global emergencies and advocacy to develop systems to ensure access to medical resources for pediatric T1D are warranted.

1. Stein MB. EDITORIAL: COVID-19 and Anxiety and Depression in 2020. *Depress Anxiety*. 2020;37(4):302.

Pediatric Endocrinology

DISORDERS OF PUBERTY

6-Month Subcutaneous Leuprolide Acetate Effectively Suppresses Clinical Signs of Puberty in Children With Central Precocious Puberty

Erica A. Eugster, MD¹, Stuart Atkinson, MB ChB², Deborah Boldt-Houle, PhD², Bradley Scott Miller, MD, PhD³.

¹Riley Hospital for Children at Indiana University Health, Indianapolis, IN, USA, ²TOLMAR Pharmaceuticals, Inc, Buffalo Grove, IL, USA, ³University of Minnesota Masonic Children's Hospital, Lino Lakes, MN, USA.

Objective: Gonadotropin-releasing hormone (GnRH) agonists, such as intramuscular leuprolide acetate, triptorelin and the subcutaneous histrelin implant, are standard treatment for central precocious puberty (CPP). Implants require surgery and sometimes anesthesia, while frequent intramuscular injections can be painful. A shift to longer acting-formulations and subcutaneous injections has been proposed for the treatment of CPP. Therapies with convenient administration, prolonged duration of action and favorable safety profile may be beneficial, improving patient adherence. 87% of subjects achieved stimulated LH suppression to <4 IU/L by Week (W) 24 in a Phase III trial evaluating the efficacy and safety of the first 6-month subcutaneous injectable in situ gel leuprolide acetate for CPP. We present secondary analyses of bone age (BA) advancement, weight, BMI, and pubertal maturation from this trial.

Methods: 62 children (60 girls, 2 boys) with CPP (naive to treatment) received 2 doses of 45 mg subcutaneous leuprolide acetate at 24-week intervals, constituting the intent-to-treat population. Radiographs of the left hand and wrist were used to determine BA using the Greulich and Pyle method. BA was assessed by a blinded central reader. Rate of BA advancement was determined by the ratio of BA to chronological age (CA, BA/CA). Pubertal maturation was categorized with the Tanner staging system using breast development, external genitalia, and pubic hair. Safety outcomes were measured.

Results: Mean age at onset of treatment was 7.5 ± 0.9 (SD) (range 4-9) years. BA/CA consistently declined throughout treatment, from 1.4 ± 0.2 at baseline, to 1.3 ± 0.1 at W24 and 1.3 ± 0.1 at W48. Although mean weight increased 8.7% from screening to W24 (34.8 kg vs 37.7 kg) and 16.9% from screening to W48 (40.4 kg), mean BMI remained stable throughout the study. The proportion of girls with early breast Tanner stage development (stage 1 and 2) increased from 9% at baseline to 37% at W48. The proportion of girls with late breast Tanner stage development (stage 4 and 5) decreased from 18% at baseline to 5% at W48. Both boys regressed from Tanner stage 3 to stage 2 for external