adolescents with Helicobacter pylori infection and 1.8 + -0.6 (p = 0.02) in uninfected patients. Conclusions:The values of insulinemia and HOMA-IR were higher in the group of adolescents with Helicobacter pylori infection, compared to those evidenced in the group of uninfected.

Pediatric Endocrinology

DIABETES, INSULIN, AND LIPIDS IN PEDIATRIC ENDOCRINOLOGY

Expression of Vitamin D Receptor Pathway Genes in Subcutaneous Adipose Tissue of Obese Individuals

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Introduction: Vitamin D deficiency is a substantial comorbidity in 50% of pediatric patients and is linked with poorer health outcomes in children. Vitamin D levels are also shown to be inversely related to BMI. Therefore, there are many more children with low vitamin D levels due to the increasing prevalence of pediatric obesity. Pediatric patients with obesity and vitamin D deficiency also have a uniquely increased risk of metabolic syndrome, as compared to their lean peers. Measured levels of vitamin D correlate with other physiological markers of vitamin D effects in lean individuals but not obese individuals. It is possible that vitamin D levels reflect a storage form of vitamin D rather than a true reflection of vitamin D action in the body in this particular population. The aim of this study was to provide foundational knowledge to understand if expression of vitamin D receptor (VDR)-target genes may be used as a reference standard for vitamin D status in the body. **Methods:** We performed a secondary analysis of samples obtained from 33 obese adolescents that were consented under a past IRB-approved protocol. They were between the ages of 13 to 18 years that underwent bariatric surgery between 2004 and 2019. Data comprised of age, gender, race/ethnicity, and BMI. Samples collected included blood and subcutaneous adipose tissue. The tissue was analyzed via Real Time-PCR to obtain quantitative levels of VDR-target gene expression, which included *PPARg, TLR4, THBD, CYP24A1*, and *VDR*. Gene expression levels were normalized to the average of two housekeeping genes, *GAPDH* and *RPLPO*. Blood samples provided vitamin D levels (serum 25(OH)D). **Results:** VDR-target gene expression was significantly correlated between *THBD*, *VDR,* and *TLR4* ($p < 0.05$), and *PPARg* with *THBD* and *TLR4* ($p < 0.05$). There was no correlation observed between *CYP24A1* gene expression and the other genes that were evaluated ($p > 0.05$). *PPARg*, *THBD*, *TLR4*, *CYP24A1,* and *VDR* gene expression levels did not correlate with circulating serum 25(OH)D levels ($p > 0.05$). **Conclusion:** These preliminary findings suggest that VDR-target gene expression correlates with each other but not with circulating serum 25(OH)D levels. This discrepancy supports that 25(OH)D levels do not indicate levels of vitamin D action and may not be an appropriate indicator of vitamin D deficiency in the obese population. Also, the observed *CYP24A1* gene expression was limited in subcutaneous adipose tissue yet expression was seen in multiple other VDR-target genes. This emphasizes the tissue-specific nature of gene regulation of vitamin D. Further work should investigate VDR-target gene expression levels across multiple tissues of obese individuals to determine if markers of vitamin D action in one tissue are reflective of action across the body. This study may provide the first step in determining a new and more accurate biomarker for vitamin D deficiency and treatment in obesity.

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DIABETES, INSULIN, AND LIPIDS IN PEDIATRIC ENDOCRINOLOGY

Features of Slowly Progressive Type 1 Diabetes Mellitus in Overweight Adolescents

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Background: he obesity epidemic has led to an increase in the incidence of type 1 diabetes mellitus (T1DM) on the background of overweight. The combination of T1DM and obesity can lead to an erroneous diagnosis of type 2 diabetes (T2DM). **Methods:** The study included 35 adolescents with T1DM. Inclusion criteria were obesity at onset, high titer of diabetes-associated autoantibodies, and insulin requirement less than 0.5 U/kg with a diabetes duration of more than 6 months. We assessed the level of HbA1c, fasting level of insulin and c-peptide, and level during the Mixed-Meal Tolerance Test, the immunological status of GADA, IA-2, ZnT8, ICA. **Results:** The age of onset was 12.7 years [10.6; 14.5], the tanner stage of puberty was 4 [3; 5]. Sex distribution: boys (n = 25) - 71.5%, girls (n = 10) - 28.5%. HbA1c at the time of onset equaled 8,9% [7.4; 10.45]. Ketosis/diabetic ketoacidosis was registered in 47.8%. The duration of the diabetes was 1.7 years at the moment of examination [0.7; 2.9]. The fasting level of C-peptide - 1.37 mμg/ml [1.0.9; 2.19], insulin level (n = 26) - 13.93 uU/ml [9.57; 19.77]. The maximum level of stimulated secretion of C-peptide (n = 21) - 5.13 mμg/ml [3.05; 6.07], of insulin secretion (n = 21) - 58.59 uU/ml [31.02; 79.74]. Higher HOMA of insulin resistance (n = 25) was detected in 72% of the examined patients. In the study of pancreatic autoantibodies, an increase in ICA was detected in 57% (median of titer 1.68 [0.28;11.7]), IA-2 - 67% (192.8 ME/ml [65; 310.1]), GAD - 59% (90.25 ME/ml [32.27; 214.6]), ZnT8 - 82% (350.5 [90.4; 506.05]). The presence of 2 or more autoantibodies is found in 94% of cases. Dyslipidemia was observed in 34.8%, arterial hypertension was identified in 23% of patients. Received therapy: insulin 82%; metformin 0.02%; metformin + insulin 5.7%. Median daily dose per patient was 0.3 U/kg [0.2; 0.5]. **Conclusion:** T1DM in adolescents with obesity and overweight has a similar clinical picture both with T1DM (insulin dependence, high titer of autoantibodies, ketosis) and T2DM (slow progression of the disease, low insulin requirement, preserved secretion of c-peptide, and insulin for more than 1.5 years). We hypothesize that obesity and insulin resistance may contribute to DM onset at an earlier date, even if a satisfactory function of pancreatic beta-cells