syndrome (GBS) presented to our institution with fatigue, nausea, vomiting, polyuria, and polydipsia. She had no history of diabetes. Her history was also significant for GBS, diagnosed 5 months prior to her current admission. She was treated with intravenous immunoglobulin (IVIG) and had partial improvement of motor impairment. On exam, she was noted to have dry mucous membranes, epigastric tenderness, and patches of hyopigmented skin. Laboratory studies were consistent with diabetic ketoacidosis, and she was admitted to the ICU for management.

Labs from 5 months prior were significant for a HbA1c of 6.4% (4.0-5.6%), TSH <0.002 mIU/L (0.350-4.7 mIU/L), total T3 154.9 ng/dL (79-149 ng/dL), and free T4 1.7 ng/dL (0.7-1.9 ng/dL), and elevated thyroid stimulating immunoglobulin.

During the current admission, HbA1c had risen to 13.6%, C-Peptide 0.6 ng/mL (1.1-4.4 ng/mL) and GAD-65 antibody >250 IU/mL (<5 IU/mL), consistent with a diagnosis of late-onset type 1 diabetes. Repeat thyroid function tests (TSH <0.002 mIU/L, total T3 74 ng/dL, and free T4 1.2 ng/dL), were consistent with subclinical hyperthyroidism. A 21-hydoxylase antibody level was 13 U/mL (<1 U/mL), but cortisol rose appropriately in response to cosyntropin. Based on the patient's constellation of vitiligo, autoimmune thyroid disease, type 1 diabetes, and elevated 21-hydroxylase antibodies, she was diagnosed with APS2.

Conclusion: We present an unusual case of a patient with APS2, who was diagnosed with type 1 diabetes 5 months after developing GBS and being treated with IVIG. Prior reports demonstrate an association between GBS and other autoimmune diseases, including one case report of GBS in a patient with APS2. HLA DR3 has been associated with APS2, type 1 diabetes, Addison's disease and Grave's disease. Its association with GBS is less clear, although HLA DR3 was increased in one Mexican cohort with GBS. This case report adds to the literature suggesting an association with GBS and other autoimmune diseases, specifically, with APS2.

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Diabetes Mellitus and Glucose Metabolism

TYPE 2 DIABETES MELLITUS

Case Study of Nonalcoholic Steatohepatitis Reversibility in Type Two Diabetic Patient with Weight Loss Using Liraglutide

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SUN-694

Case Study of Nonalcoholic Steatohepatitis Reversibility in Type Two Diabetic Patient with Weight Loss Using Liraglutide

Introduction

Nonalcoholic fatty liver disease (NAFLD) is a common form of chronic liver disease.[1] NAFLD prevalence is likely to be between 75- 100% in the morbidity obese. Where Nonalcoholic steatohepatitis (NASH) in turns develops in 30% of patients with NAFLD. Obesity prevalence in Kuwait is estimated to be 39% for adults male and 52% for adults females.[2] No pharmacotherapy is approved for NAFLD treatment, and the basis treatment is lifestyle modifications focusing on body fat loss.[3] A study showed that may take 10% or more weight loss to have an impact on NASH Activity Scores as assessed by liver biopsy. Glucagon-like peptide-1 receptor agonists (GLP-1 RA) are approved for the treatment of T2D and obesity and have also been shown to reduce liver inflammation and fibrosis.[3]

Methods

A 54 years old male presented to our clinic with a history of hypothyroidism, diabetes with Hemoglobin A1C (HbA1c) of 7%, hypercholesterolemia and overweight with Body Mass Index (BMI) of 27.6 kg/m2

Patient's investigations showed high Gamma-glutamyl transferase (GGT) and ferritin level, and due to his abnormal liver function test patient was referred for abdominal ultra sound that showed fatty liver disease. With a high NAFLD score, he was referred for Fibroscan that showed fibrosis score of F3; which indicates a sever liver scarring.

GLP-1 RA was started for weight management and a better glycemic control in a setting of multidisciplinary team, including endocrinologist, diabetes educator, dietitian and a physical trainer.

Results

In a six months' period of time, patient was able to lose 15.3% of his total body weight, with better glycemic control of HbA1c of 5.6% from 7% and his repeated Fibroscan showed improvement in his score from F3 to F0 with other clinically important outcomes.

Conclusion

GLP-1 RA seems to be safe to use for patients with NASH, and it might have benefits of reversing fibrosis in addition to other benefits such as weight reduction and HbA1c improvement.

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Genetics and Development (including Gene Regulation)

GENETICS AND DEVELOPMENT AND NON-STEROID HORMONE SIGNALING I

Custom Panel to Diagnosis Genetic Endocrine Disorders in a Tertiary Academic Hospital

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SUN-710

Next-generation sequencing (NGS) has been transforming the endocrine diagnostic methodology allowing the genetic testing to assume an exploratory role rather than only a confirmatory one. This is possible due to lower costs and increased yield of information. A way to further increase efficiency and sensitivity for variant detection is the use of a sequencing custom panel selecting specific genes for screening. In endocrine disorders, the complex and intricate genotype-phenotype relations and occurrence of diverse comorbidities made the diagnosis challenging. Our aim is to analyze the efficiency of a multigenic panel for molecular diagnosis of endocrine disorders in patients assisted in a tertiary academic hospital, as well as to train academic and medical faculties in the use of molecular tools. Genomic DNA from 282 patients was extracted from blood sample using standard procedures. Sanger method was previously used to screen some candidate genes in half of the patients. The custom panel was designed with 651 genes using the SureDesign tool (Agilent technologies), either associated with the phenotype (OMIM) or candidate genes that englobes developmental (DD), metabolic (MD), and adrenal (AD) disorders. Libraries were prepared with SureSelect^{XT} Target Enrichment kit (Agilent Technologies). The enriched DNA libraries were sequenced in NextSeq 500 (Illumina) with High Output V2 kit (2 x 150 bp). The raw data was aligned to hg19 with BWA-MEM, variant calling was performed using FreeBayes and annotated with ANNOVAR. Filtering took into consideration the rarity (≤1%) of variants in population databases and those in exonic or splice site regions. Variants found were then classified according ACMG/AMP criteria. The categories of Pathogenic (P) and Likely Pathogenic (LP) were considered for molecular diagnosis, while variants of uncertain significance (VUS) were only reported. The average result of 3 runs was: 159 Kmm^2 of cluster density, 76.5 % of Q30 and 76.6 Gb of data were generated. The mean coverage depth of the targeted regions in panel sequencing data was 237x (SD±110x), with at least 96.3% of the sequenced bases being covered more than 20-fold. Out of the 282 patients, we identified 65 LP/P variants (23%), 22 VUS (8%) and 195 remained undiagnosed (69%). Considering the solved cases, 54 (19.1%) have DD, 6 (2.1%) have MD and 5 (1.8%) have AD. Taking into account that half of the patients had already been previously screened, the data enable new findings in known genes. The application of a multigenic panel aids the training of medical faculty in an academic hospital by showing the big picture of the molecular pathways behind each disorder. This may be particularly helpful considering the higher diagnosis of DD cases. A precise genetic etiology provides improvement in understanding the disease, guides decisions about prevention or treatment, and brings comfort to the affected families.

Adipose Tissue, Appetite, and Obesity

OBESITY TREATMENT: GUT HORMONES, DRUG THERAPY, BARIATRIC SURGERY AND DIET

Vitamin B12 Deficiency Leads to Fatty Acid Metabolism Dysregulation and Increased Pro-Inflammatory Cytokine Production in Human Adipocytes and Maternal Subcutaneous and Omental Adipose Tissue

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MON-598

Vitamin B12 Deficiency Leads To Fatty Acid Metabolism Dysregulation and Increased pro-inflammatory cytokine production in Human Adipocytes and Maternal Subcutaneous and Omental Adipose Tissue

Vitamin B12 (B12) is an essential micronutrient required for optimal hematopoietic, neurologic and other several metabolic reactions. Animal and clinical studies show that B12-deficiency is associated with maternal obesity, insulin resistance, and metabolic syndrome. Given the key metabolic role of adipose tissue, we investigated whether B12 deficiency may affect triglyceride synthesis and lipid metabolism leading to adipose tissue inflammation. The AbdSc pre-adipocyte cell line (Chub-S7) and human AbdSc primary pre-adipocytes were differentiated under different B12 concentrations (25pM,100pM,1nM,500nM). Human Om, Sc-AT and blood samples were collected from 106 pregnant women at delivery. SerumB12 and relevant metabolic risk factors were measured. Gene expression was performed by q-RTPCR, *de novo* triglyceride synthesis was quantified by radioactive tracing, ß-oxidation and palmitate-induced oxygen consumption rate was determined using seahorse-XF analyser. Adipocytes cultured in low-B12 conditions showed significantly increased expression ($P<0.01$) of triglyceride biosynthesis genes (ELOVL6,SCD,GPAT,LPIN1 and DGAT2), a significantly decreased expression ($P<0.01$) of ß-oxidation genes (FAT/CD36,CPT1-ß,ACADL,ECHS1 andACAA2) and an increased expression ($P<0.01$) of pro-inflammatory cytokines (IL-1, IL-6,IL-8,IL-18,TGF-β,TNF-α and MCP-1). These data were also confirmed in the AT of B12-deficient pregnant women. Additionally, real-time fatty acid flux synthesis and fatty-acid-oxidation induced by palmitate were significantly altered ($P<0.05$) in B12-deficient adipocytes. Our data highlights that B12-deficiency has profound effects on adipocyte dysfunction, opening new insights into the pathogenesis of maternal obesity and the relevance of micronutrient supplementation for pregnant mothers.