Case Report Background

Subject: 18 year-old College female soccer player with diabetes secondary to lipodystrophy participated in a single case study design

Physical Findings

Athlete stated she was diagnosed with Diabetes during PPE and Lipodystrophy at 6 months of age. Her medical records indicated at her 4-year old appointment, her insulin levels at the time were elevated at 116, and presented with acanthosis in her neck and axilla. At her 5-year old check-up, she was diagnosed with hypothyroidism by a significant elevation of T8 and T4. The following year, her triglyceride levels were elevated at 2.58 and her cholesterol/HDL ratio was elevated at 3.5. She showed mutations in her genetic testing of AGPAT2 gene associated with Type 1 lipodystrophy. Centrifugal lipodystrophy is the result of a mutation in the gene that produces the protein PAT2. It causes the body to unsuccessfully store and use fats properly. These mutations lead to the lack of adipose tissue. The lack of these tissues can contribute to impaired glucose tolerance, insulin resistance, and hyperlipidemia. The athlete was referred for a single case study for her glucose levels and lipid metabolism.

Differential Diagnosis

• Congenital Generalized Lipodystrophy with Type 2 diabetes
• Congenital Generalized Lipodystrophy
• Prediabetes

Diagnostic Testing

Nutrient Consumption Target
Carbohydrates 343 g 340 g
Protein 266 g 400-420 g
Potassium 1838 mg 4700 mg
Calcium 565 mg 1000 mg
Vitamin C 53 mg 75 mg
Vitamin D 6 ug 15 ug
Vitamin K 72 ug 90 ug
Vitamin E 5 mg AT 15 mg AT

Results

Congenital lipodystrophy has no effect on her soccer training or physical activity. She meets all the requirements for a diabetes mellitus secondary to lipodystrophy. Her doctor prescribed her metformin at 500mg and her triglycerides level at 1.58. Athlete was discharged from the clinic at age 11. Her recent blood work for glucose screening revealed her hemoglobin levels low at 116 leading to her hematocrit levels to be low at 0.35. Her glucose was elevated at 28 and her CK was elevated 543. Her triglyceride levels were elevated at 2.58 and her cholesterol/HDL ratio was elevated at 4.2. At age 7, she reported with polydipsia and polyuria. Her insulin levels increased to 203 and her triglycerides levels remained elevated. She also was diagnosed with nonmorcyic anemia with decreased levels of hematocrit; presentation of acromegalic on the head and neck. Muscular hypertrophy and phlebomegaly. At the age of 8, she showed mutations in her genetic testing of AGPAT2 gene associated with Type 1 lipodystrophy. Congenital Generalized Lipodystrophy with Type 2 diabetes is a rare inherited disorder that leads to the lack of adipose tissue. The signs and symptoms of congenital lipodystrophy are generalized at birth or early childhood. Due to the lack of adipose tissue the body becomes less insulin resistant. The signs and symptoms of congenital lipodystrophy are generalized at birth or early childhood. Due to the lack of adipose tissue and excess musculature, individuals appear very muscular. Veins present prominent due to the lack of adipose tissue underneat the skin. Those who are affected by lipodystrophy have a large chin, prominent orbital ridges, large hands and feet, and a prominent umbilicus. One of the most common factors is insulin resistance. Insulin resistance occurs when the body’s tissues are incapable of recognizing insulin. Insulin is a hormone that is needed to help regulate blood sugar levels. Insulin resistance can lead to a more serious disease called diabetes mellitus if insulin therapy is not treated properly.

Discussion and Summary

Lipodystrophy is a very rare condition and has a lot of serious correlating factors. Diabetes is one of the most common factors of lipodystrophy. Diabetes is a abnormal rise in blood glucose levels that is called hyperglycemia. Type 2 diabetes does not use insulin properly leading to insulin resistance. The worst of the factors is hypertrophic cardiomyopathy, which the myocardium of the heart is abnormally thick. Hypertrophic cardiomyopathy is the number 1 leading cause of sudden death of young athletes. As you can see with the case study, lipodystrophy is not a ineligible condition in sports but the relating factors can lead to serious conditions leading to ineligibly.

Other possible treatments for lipodystrophy are leptin treatment has been proven profitable in managing hyperglycemia and diabetes mellitus. In lipodystrophy, the leptin levels and cellular leptin sensitivity is reverse in lipodystrophy, leptin levels and cellular leptin sensitivity is not susceptible to it; therefore, leptin replacement therapy is used as the primary treatment of choice. Currently, the 4-month leptin-replacement therapy protocol was started to enhance glucose levels and lipid metabolism in nine female patients with lipodystrophy in the United States. Considering the results of the leptin-replacement therapy, it is very certain that leptin deficiency is the primary effect of the metabolic abnormalities correlated with lipodystrophy. Under harsh discipline of changes in lifestyle and a marked high resistance of injection, we establish that the leptin-replacement therapy enhances both insulin sensitivity and insulin secretion adequately and briskly improves glucose and lipid metabolism in patients with generalized lipodystrophy. Its results are managed for up to 36 months without any adverse effects. Leptin-replacement therapy is generally a long-term and high-cost intervention. Leptin replacement therapy is beneficial to manage glucose and lipid metabolism for a long period of time. Research shows that leptin-replacement therapy is a sufficient and safe treatment for long-term improvement of glucose and lipid metabolism and obstacles in generalized lipodystrophy.

References