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Uncovering the Truth After 18 Years: A Case of Generalized Lipodystrophy Misdiagnosed as Type 1 Diabetes in a Saudi Female from Al-Baha, Saudi Arabia

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ABSTRACT

Congenital generalized lipodystrophy type 1 (CGL1) is a very rare autosomal recessive genetic mutation with generalized lipoatrophy and metabolic complications. We report CGL1 in A Saudi female in albaha with lipoatrophy, diabetes mellitus, hypertriglyceridemia, steatohepatitis, and acanthosis due to very rare homozygous 1 - acylglycerol - 3 - phosphate O - acyltransferase β (AGPAT2) genetic variant.

Keywords: lipodystrophy, AGPAT2, CGLs.

INTRODUCTION

Lipodystrophy syndromes are rare heterogeneous disorders, inherited or acquired, and characterized by partial or generalized loss of adipose tissue with subsequent development of insulin resistance and its complications. Genetic lipodystrophies are inherited in autosomal recessive or autosomal dominant pattern, the two most common subtypes of genetic lipodystrophies are congenital generalized lipodystrophy (CGL) and familial partial lipodystrophy (FPLD). CGLs, or Berardinelli–Seip congenital lipodystrophy (BSCL), are autosomal recessive disorders frequently recognized at birth or shortly thereafter. At least four molecularly different genetic mutations of congenital lipodystrophy have been defined, including AGPAT2, BSCL2, CAV1, and polymerase I and transcript release factor (PTRF). Mutations of 1 - acylglycerol - 3 - phosphate O - acyltransferase 2 (AGPAT2) in CGL type 1 and seipin in CGL type 2 are responsible for 95 percent of reported cases. The severity of these metabolic derangements is mostly proportional to the extent of body fat loss.

In this case Female patint25 years old was referred to diabetes and endocrinology center in albaha , with history of hepatic disease since childhood (2 years old) with positive family history but not aware of exact diagnosis, Insulin dependent diabetes with sever insulin resistance since 9 years, The menarche started at the age of 14, and then, she had irregular periods (oligomenorrhea) Every 3-6 months over the last 8 years.

DESIGN/METHODOLOGY/APPROACH

The proposed approach was used to study Congenital Generalized Lipoatrophy Type 1 and Description of Novel AGPAT2 in a 25-year-old patient.

Case Analysis

A 25-years-old woman presented to the hospital complaining of abnormal hair morphology; abnormality of skin pigmentation; abnormality of the liver; abnormality of the menstrual cycle; abnormality of the skeletal system; abnormality of the skin; chronic hepatitis; diabetes mellitus; elevated hepatic transaminase; failure to thrive; growth delay; hirsutism. hypertriglyceridemia; insulin resistance; lipodystrophy; skeletal muscle atrophy; type I diabetes mellitus BMI = 18.9 KG/M2 BP = 100/60 PULSE: v 80 B/M REGULAR

Patients are conscious: well-oriented. no jaundice or pallor. She has generalized fat loss areas along with acanthosis nigricans hirsutism.

Foot examination: sensitive with normal perfusion Skin dermopathy bilaterally over both legs Thyroid examination: no goiter or bruit detected Abdomen exam: hepatomegaly

Chest and heart: normal with ease and no murmurs or added sounds.

Past Medical History

Patient has history of hepatic disease + dyslipidemia since childhood (2 years old) with positive family history of similar condition but not aware of exact diagnosis

Post-Operative history:

injection OD Avastin, there was an improvement in the central macular edema, but the effect of the thrombus persisted in the central vein of the right retina

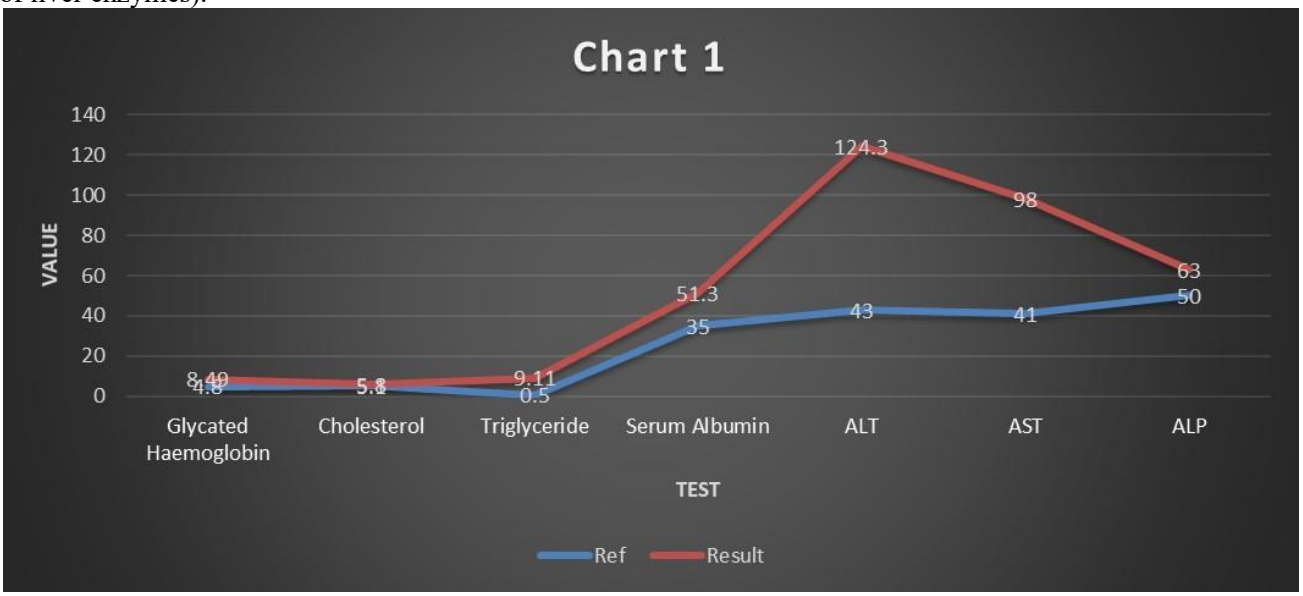
Vitals

BMI = 18.9 KG/M2 BP = 100/60 PULSE: v 80 B/M REGULAR

RESULTS

I. Chart (1) Shows the results of the patient's blood test in October, 2022.

II. revealed high levels of fasting serum glucose and HbA1c, and triglyceride levels with mild evaluation of liver enzymes).



A clinical diagnosis of CGL was suspected, and genetic analysis was performed, which confirmed autosomal recessive GCL type 1 with a homozygous variant identified at AGPAT2 gene (Table 1).

Gene	Variant Coordinates	Amino Acid Change	Zygosity	In Silico Parameters	Allele Frequencies	Type and Classification

AGPAT2	NM-006412.3;c.158del	p.(Gly53Alafs*8)	homozygous	PolyPhen; Align-GVDG; SIFT;MutationTaster;Conservation-nt; N/A Conservation-aa;N/A	GnomAD; ESP;1000G; CentoMD;	FRAMESHIFT Pathogenic (CLASS1)

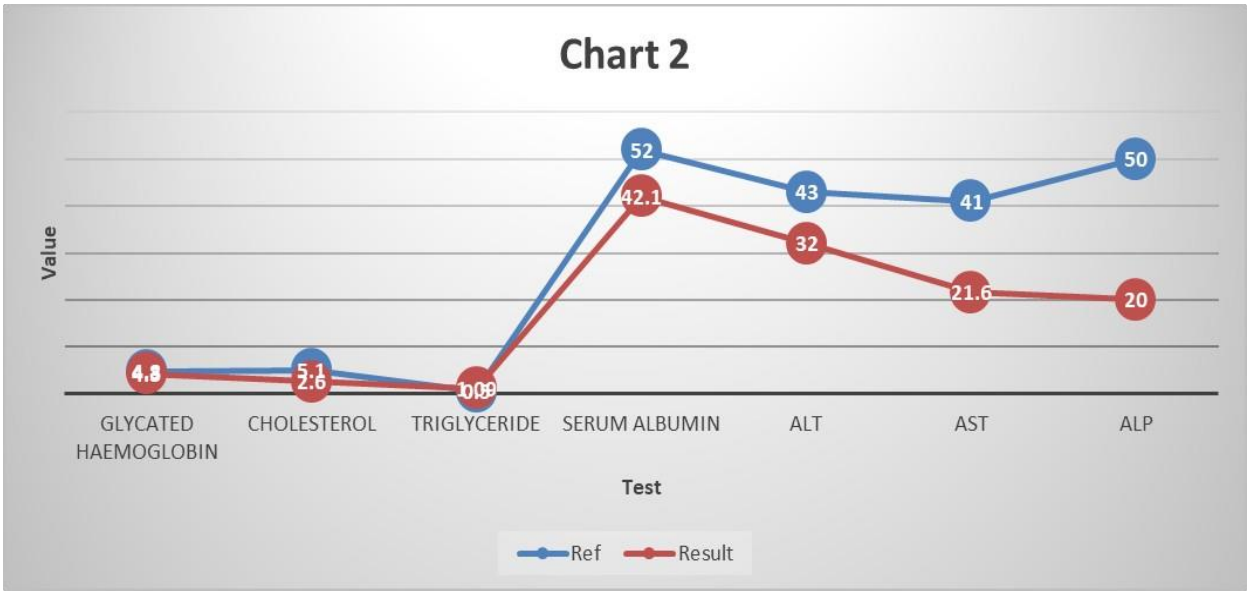
VARIANT INTERPRETATION (AGPAT2, c. 158del p. Gly53Alafs*8)

The AGPAT2 variant c. 158del p.(Gly53Alafs*8) creates a shift in the reading frame starting at codon 53. The new reading frame ends in a stop codon 7 positions downstream. According to HGMD Professional 2022.1, this variant has previously been described in patients with generalized lipodystrophy (PMID: 20437613, 31130284). It is classified as pathogenic (class 1) according to the recommendations of Congenital generalized lipodystrophy (CGL), or Berardinelli-Seip syndrome (BSCL), is usually diagnosed at birth or soon thereafter. Because of the absence of functional adipocytes, lipid is stored in other tissues, including muscle and liver. Affected individuals develop insulin resistance and approximately 25%-35% develop diabetes mellitus between ages 15 and 20 years. Hepatomegaly secondary to hepatic steatosis and skeletal muscle hypertrophy occur in all affected individuals. Hypertrophic cardiomyopathy is reported in 20%-25% of affected individuals and is a significant cause of morbidity from cardiac failure and early mortality.

Action Taken

At the beginning of 2023 the patient was on the following medications :

Degludec	40		unit		SC		OD
Aspart	35		unit		SC		TID
Metformin		500-500-1000		mg			TID
Pioglitazone		15		mg			OD
Fenofibrate		145		mg			OD
Liraglutide		1.8 mg SC.				OD	



And after the patient was assessed by the consultant and diagnosed as familial GCL , the patient was started on lipitin hormone therapy , a year after all anti diabetes and anti lipid medications were stopped and blood was retested for improvement ,it revealed normalization in levels of fasting serum glucose and HbA1c, and triglyceride levels with normalization of liver enzymes) chart (2) Shows the results of the

patient's blood test in September, 2024.

CONCLUSION

In summary, we report a femail patient with CGL type 1 due to AGPAT2 variant c.158del/p.(Gly53Alafs*8) frameshift mutation. The description of the clinical, biochemical, and molecular features of these cases is of great importance for the clinicians to build up data regarding this disease and for early diagnosis and appropriate screening and prevention of complications.

REFERENCES

Grundy, S. M., et al. (2013). "Diagnosis and Management of Lipodystrophy." The Lancet Diabetes & Endocrinology, 1(6), 422-428.

Agarwal, A. K., et al. (2002). "Congenital Generalized Lipodystrophy: A Review." The Journal of Clinical Endocrinology & Metabolism, 87(4), 1293-1301.

Sikora, S. A., et al. (2011). "Lipodystrophy Syndromes." Endocrinology and Metabolism Clinics of North America, 40(2), 367-381.

