A case of newly diagosed type 2 diabetes mellitus case with extremely elevated a1c and triglyceride levels

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Abstract

Type 2 diabetes mellitus (DM) is a chronic metabolic disorder characterized with defects in insulin action. Glycated hemoglobin (A1c); a predictor of diabetic control, is used in follow up of the diabetic subjects. In this case report, we aimed to present a newly diagnosed type 2 diabetic subject with extremely high A1c and serum triglyceride levels. A 49-year-old man showed up to our clinic with complaints of weight loss due to good appetite, increased amount of micturition and increased sense of thirst. In serum analysis, his fasting plasma glucose was 494 mg/dl, A1c was 19.8%, and triglyceride was 4499 mg/dl. With appropriate insulin and antihyperlipdemic treatment, his blood glucose and triglyceride reduced to less dangerous levels. In conclusion, since type 2 DM has an insidious onset, it can be present for years and develop hypertriglyceridemia and complications before establishment of the diagnosis. Therefore, screening DM in adults is strongly advised.

Introduction

Type 2 diabetes mellitus (DM) is a chronic metabolic disorder characterized with defects in insulin action. Prevalence of type 2 DM is increasing by time in developed countries and causes a great economic burden in healthcare systems [1]. Glycated hemoglobin (A1c); a predictor of diabetic control, is used in follow up of the diabetic subjects. Initially, it is not suggested to be used as a diagnostic tool due to difficulties in standardization of A1c measurement. After evidences of its prognostic value accumulated, authors introduced the A1c as diagnostic and follow up tool in diabetic subjects.

Dyslipidemia is one of the major cardiac risk factors in diabetic population [2]. Hypertriglyceridemia, as a lipid metabolism disorder, is a consequence of overproduction or defective processing and clearance, or both. Treatment of hypertriglyceridemia is essential, since it is supposed as an independent risk factor for cardiovascular diseases, and moreover, it has important role in etiologies of non-biliary pancreatitis and non-alcoholic steatohepatitis [3].

In this case report, we aimed to present a newly diagnosed type 2 diabetic subject with extremely high A1c and serum triglyceride levels, and to review the literature.

Case report

A 49-year-old man showed up to our clinic with complaints of weight loss due to good appetite, increased amount of micturition and increased sense of thirst. His medical history was not relevant for any chronic diseases or use of any medication. His family history was positive for type 2 DM. On physical examination, his height was 164cm, weight was 78kg, waist circumference was 99cm. A body mass index was calculated as 29kg/m². His systolic blood pressure was 130mmHg and diastolic blood pressure was 80mmHg. Rest of the physical examination finding were normal.

A bundle of blood laboratory test results was as follows: fasting plasma glucose: 494 mg/dl, A1c: 19.8%, sodium: 122 meq/l, triglyceride: 4499 mg/dl, LDL-cholesterol: 172 mg/dl, HDL-cholesterol: 25 mg/

dl. Other serum biochemistry was in normal range. Similarly, arterial blood gas analysis and urinalysis were normal.

He is diagnosed with type 2 DM and intensive insulin treatment; 4 times a day, at a dose of 0.5 IU/kg initiated along with fenofibrate 267 mg and Atorvastatin 20 mg daily. His blood glucose frequently checked and remained between 150-200 mg/dl during follow up. Abdominal examination and query (both history and serum biochemistry) performed in certain intervals since elevated triglyceride levels could cause pancreatitis. Abdominal sonography, serum amylase and lipase levels were normal. Diabetic retinopathy and lipemia retinalis were ruled out with eye examination. A 24 hours urine analysis revealed proteinuria at micro albuminuria level.

A coronary angiography performed due to non-specific chest pain and suspicious ST elevation in electrocardiogram. A 20 % narrowness in left anterior descending artery revealed and cardiologists suggested medical treatment.

Before discharging from hospital, control serum triglyceride measurement performed. It was reduced to 680mg/dl. He remained symptom free during hospital stay and discharged from hospital at 7th day, as his blood glucose measurements are in target. He was advised to use Metformin 1000 mg twice a day plus subcutaneous insulin 4 times a day (pre-prandial short acting 20 IU three times and 46 IU basal insulin glargin).

Discussion

Due to insidious course of the disease subjects with undiagnosed type 2 DM cases have serious complications when they refer to clinics.

Therefore, all complications should be screened when a patient is diagnosed with type 2 DM. Despite the fact that our case applied to a new diagnosis, the patient had entered a catabolic process; weight loss, polyuria and polydipsia symptoms occurred. HbA1c value of 19.8% was determined as a sign of poor metabolic control, in present case. In literature, A1c is considered as the most important predictor of metabolic control in DM and values of 13% and above are predict poor metabolic control [4-5]. Hyperglycemia along with hypertriglyceridemia and low HDL cholesterol lead a diagnosis of metabolic syndrome, however, his blood pressure was remained in normal range despite intravenous fluid replacement.

Hypertriglyceridemia is an important problem that must be kept in mind in the differential diagnosis of acute non-biliary pancreatitis. On the other hand, hypertriglyceridemia may also be a consequence of acute pancreatitis. Although the prevalence of hypertriglyceridemia in acute pancreatitis varies, edematous and necrotizing pancreatitis are have similar hypertriglyceridemia risk [6]. Both primary and secondary hypertriglyceridemia can lead to acute pancreatitis. Hypertriglyceridemia at levels of 500 to 1000 mg/dL may trigger acute pancreatitis [7]. Although the triglyceride level was extremely high (4499mg/dl) in present case, the patient did not encounter with acute pancreatitis during hospital stay.

A lot of studies showed that main risk factors for development of cardiovascular complications are dyslipidemia, DM and obesity, components of metabolic syndrome. Atherogenic dyslipidemia is one of the interchangeable risk factors. Dyslipidemia, as a modifiable risk factor, should be managed with fibrates and statins in combination [8]. In our case, both fenofibrate and insulin treatments reduced triglyceride levels.

Risk factors for central retinal vein occlusion are somewhat similar to risk factors of cardiovascular diseases (eg, arteriosclerosis, arterial systemic hypertension, diabetes mellitus, and dyslipidemia) [9]. Therefore, we evaluated present case for eye complications by consulting with an ophthalmologist.

In conclusion, type 2 DM is an insidious disease which has direct toxic effects on the arterial system. Before establishment of the diagnosis, it can be present for years and develop hypertriglyceridemia and complications. Therefore, screening DM in adults is strongly advised.

References

1. Shaw JE, Sicree RA, Zimmet PZ (2010) Global estimates of the prevalence of diabetes for 2010 and 2030. *Diabetes research and clinical practice* 87: 4-14. [Crossref]

2. Javadi E, Yarahmadi S, Larijani B, Mohammadi S-a, Shafaei A-R, et al. (2002) Prevalence of Dyslipidaemia in Diabetic Patients Attending The Diabetes Clinic At Doctor Shariati University Hospital Between October 1998 And September 2000. *Iranian Journal of Diabetes and Metabolism* 1: 133-137.

3. Burdick J, Tompwson M, Feldman M, Friadmen L, Brandt L, et al. (2006) Gastrointestinal and Liver Disease. *Saunders Elsevier* 1174-1184.

4. Mauras N, Merimee T, Rogol AD (1991) Function of the growth hormone-insulin-like growth factor I axis in the profoundly growth-retarded diabetic child: evidence for defective target organ responsiveness in the Mauriac syndrome. *Metabolism* 40: 1106-1111. [Crossref]

5. Simsek E, Kocabay K (2002) Insulin-like growth factor (IGF-I) in Mauriac syndrome or diabetic dwarfism. *Turkish Journal Of Medical Sciences* 32: 421-424.

6. Dominguez-Munoz J, Malfertheiner P, Ditschuneit H (1991) Hyperlipidemia in acute pancreatitis. *International journal of pancreatology* 10: 261-267. [Crossref]

7. Fortson MR, Freedman SN, Webster III PD. Clinical assessment of hyperlipidemic pancreatitis. *American Journal of Gastroenterology* 1995;90. [Crossref]

8. Millán JN, Pedro-Botet JM, Pintó XS (2014) Atherogenic dyslipidemia and residual risk. State of the art in 2014. *Clinica e investigacion en arteriosclerosis: publicacion oficial de la Sociedad Espanola de Arteriosclerosis* 26: 287-292.

9. Călugăru D (2011) Risk factors in central retinal vein occlusion. *Oftalmologia* 55: 27-37.