

Case Report



A Case on Type 3C Diabetes Mellitus Associated with Chronic Calcific Non Alcoholic Pancreatitis

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ABSTRACT

Type 3c diabetes mellitus is a clinically important disease with a prevalence of 5-10% among all patients with DM. Most patients with type 3c diabetes mellitus suffers from chronic pancreatitis as the underlying disease. In our case, a 47-year-old male patient came to the emergency department with known cases of diabetes mellitus and rheumatoid arthritis presented with the complaints of epigastric pain, flatulence and bloating. His computed tomography (CT) of abdomen shows pancreas with diffuse calcification, suggestive of chronic calcific pancreatitis. He was found to be hyperglycemic with a blood glucose of 309 mg/dl, he was finally diagnosed has type 3 c diabetes mellitus associated with chronic calcific non alcoholic pancreatitis. Treatment management started with intravenous lactated ringer's solution 100ml/hr along with capsule pancreatin. Long-acting insulin glargine 8 units SQ TID were given, and had a diabetic diet 2 hour after glargine administration. Our patient discharged from our department in a good general condition with insulin regimens, cap. Pancreatin and other vitamin supplements. Identifying patients with type 3c diabetes is important since the endocrinopathy in type 3c diabetes is very complex and complicated by additional present comorbidities such as maldigestion and concomitant qualitative malnutrition should also considered.

Keywords: Pancreatogenic diabetes, insulin, hyperglycemia, pancreatitis, diabetes mellitus.

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INTRODUCTION

According to American Diabetes Association (ADA) and World Health Organisation, Pancreatogenic diabetes is a form of secondary diabetes which is specified as Type 3 C Diabetes Mellitus (T3cdm)^{1,2}. It is the diabetes which occurs due to the disease of the Exocrine pancreas. T3Cdm is estimated to occur in 5-10% of all diabetic patients. In 80% of the T3cdm, chronic pancreatitis is the underlying cause³. Unlike type 1 or type 2 diabetes mellitus, the endocrinopathy in type 3c is very complex. There is maldigestion and associative malnutrition associated with T3cdm⁴. In most DM, diagnosis with pancreatitis is rarely considered, hence T3cdm is misdiagnosed and can lead to failure in therapy. The treatment of T3cdm for un-functioning pancreas includes the treatment of fat-soluble vitamins deficiency, restoring impaired fat hydrolysis and incretin secretion. The pathophysiology of T3cdm starts with the damage to the pancreas which can lead to endocrine dysfunction. The endocrine dysfunction leads to deficiency of insulin, glucagon, PP and incretin. Exocrine dysfunction with

maldigestion and malabsorption of nutrients are seen. T3cdm is ultimately due to decreased insulin secretion. Oral pancreatic enzyme therapy is important for fat digestion and nutrient absorption. It helps to control symptoms of steatorrhea and is important for maintaining incretin hormone secretion and thereby improves glucose tolerance. In chronic pancreatitis anti hyperglycaemic drug like metformin should be considered in case of insulin resistance to reduce the risk of pancreatic cancer⁴. Promising novel drug, PP has shown great promise as an antidiabetic drug for treatment of T3cdm secondary to chronic pancreatitis. It increases the expression of insulin receptors in the liver, thus enabling effective utilization of circulating insulin⁷.

Case presentation

A 47 year old male patient came to the emergency department with known cases of diabetes mellitus and rheumatoid arthritis presented with the complaints of epigastric pain, flatulence and bloating. He had taken anti-diarrheal medication for 3 days, he reported that he could see visible oil like patches in the toilet pan after defecating. On admission he having generalized body ache, abdominal discomfort, weight loss, polyuria. On physical examination the patient was conscious, well oriented. The abdomen was soft and nontender. Epigastric tenderness and bowel sound were positive. His BP was 120/90 mmhg. Pulse rate 81 beats/min. Respiratory rate was 22beats/min. BRADEN score was 19 which shows no pressure sore risk. Fasting c-peptide was assessed has 0.11ng/ml which was on normal level.



His routine blood investigation was normal. Serum amylase were increased to 150U/l, serum lipase were mildly reduced to 15 U/l. A computed tomography (CT) of abdomen revealed pancreas with diffuse calcification, suggestive of chronic calcific pancreatitis. He was found to be hyperglycemic with a blood glucose of 309 mg/dl, cardiac enzymes and lipase were sent to rule out other causes of epigastric pain. Cardiac enzyme were subsequently reported to be within the normal limit. Lipid profile was within normal range. A septic workup was also initially sent, which returned negative. He was 88kg(BMI 30.4kg/M²). The patient was clinically and by investigation looked for macro as well as micro-vascular complications of diabetes. Complications like coronary artery disease, peripheral artery disease, diabetic nephropathy, neuropathy and retinopathy were not present. The patient was normotensive had a normal pulse in all peripheral vessels and no retinopathy on fundus examination. He did not have any sensory neuropathy, asymmetric lower limb motor neuropathy nor autonomic neuropathy. Urine analysis, urine albumin to creatinine ratio (ACR), serum creatinine, ECG and 2D echocardiography were normal.

The patient's blood glucose was monitored every hour while electrolytes, serum albumin and lipase were monitored every 4 hours. treatment management started with intravenous lactated ringer's solution 100ml/hr along with capsule pancreatin 200mg. Long acting insulin glargine 10units SQ BD were given, and had a diabetic diet 2 hour after glargine administration. After 7 days of hospital admission patient discharged from our department in a good general condition with insulin regimens, cap. Pancreatin and other vitamin supplements.

DISCUSSION

Type 3c diabetes is a frequent comorbidity of chronic pancreatitis, with prevalence estimates ranging from 25% to 80%. Increased disease duration is an important risk factor for diabetes secondary to chronic pancreatitis. Here we presented a case of 47 year old male patient having type 3c diabetes mellitus with chronic pancreatitis. Pancreatogenic diabetes is a condition which remains undiagnosed or misdiagnosed. The major drawback in T3cdm is its under diagnosis. The criteria for diagnosis of T3cdm is given by Ewald and Bretzel which includes presence of pancreatic exocrine insufficiency, evidence of pancreatic pathologic insufficiency and the absence of Type 1 DM associated autoantibodies. There can also be presence of minor condition like absence of pancreatic polypeptide (PP). Most of the patients with type3c DM suffer from chronic pancreatitis as the underlying disease. The study from Germany by Ewald and colleagues found that 8% of all diabetes patients had T3cDM, most of which had chronic pancreatitis.

Assessment and monitoring of patients with pancreatic disease should include body mass index, diabetes-associated antibodies and glucose to c-peptide ratio which estimates beta cell area. Metabolic accompaniments like hypertension, lipid abnormalities are not presented for our

patient. Retinopathy, renal dysfunction, neuropathy and microangiopathic complication are not reported in our patient. It is thought that macrovascular complications occurs less frequently due to chronic malabsorption and commonly occurring in under nutrition.

Patients with T3cDM were specifically excluded from many large - scale DM studies due to their unique, eccentric clinical and metabolic characteristics. There are no specific guidelines for management of T3cdm. The treatment usually includes glycaemic control to achieve HbA1C below 7%. Usually, blood glucose slightly above normal is considered for better quality of life. Meals rich in soluble fiber and low in fat are recommended for meal induced hyperglycaemia. Management of T3cDM off-course include micro and macrovascular complications that can be prevented. They are having high chance for pancreatic cancer, follow up should be done properly. Our patient was treated under proper guidelines which includes pancreatic enzymes, vitamin supplements and other nutrients hence our patient responded favourably towards the treatment.

CONCLUSION

Type 3c diabetes mellitus is a clinically important disease with a prevalence of 5-10% among all patients with DM. Most patients with type 3c diabetes mellitus suffer from chronic pancreatitis as the underlying disease. Identifying patients with type 3c diabetes is important since the endocrinopathy in type 3c diabetes is very complex and complicated by additional present comorbidities such as maldigestion and concomitant qualitative malnutrition.

It is mandatory to treat pancreatic exocrine insufficiency in the patients even if clear clinical symptoms such as steatorrhea or gastrointestinal complaints are missing. Finally, it is important to consider the appropriate diagnosis in type 3 c DM since it can lead to failure of therapy since there is difference in the treatment from type 1 and 2 DM.

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