

Thyrotoxicosis Precipitating Diabetic Ketoacidosis: A case report

Suman Kumar Kotwal¹, Som Nath Verma², Annil Mahajan³

Abstract

Background: Diabetic ketoacidosis (DKA) is acute complication of diabetes mellitus. It is commonly seen in type 1 diabetes mellitus and rarely also seen in type 2 diabetes mellitus. In more than fifty percent of cases precipitating factor is usually unrecognized.

Case report: A 35 years women with type 1 diabetes mellitus presented with (DKA), with no apparent precipitating factor. Following initial correction of the DKA, persisting tachycardia, thyromegaly and thyroid functions confirmed diagnosis of thyrotoxicosis. Treatment with propranolol and carbimazole helped in the normalization of metabolic states. We hereby report a case of DKA precipitated by thyrotoxicosis.

Conclusion: Thyrotoxicosis is known to destabilize diabetes control, it should be considered as one of the precipitating factor for diabetic ketoacidosis.

Keywords: Diabetic ketoacidosis; Thyrotoxicosis, Type 1 diabetes mellitus

Introduction

Diabetic ketoacidosis (DKA) is an acute complication of type 1 diabetes mellitus, can occur in type 2 diabetes mellitus as well. Many factors have been incriminated to precipitate DKA. Early identification and proper a management of DKA will prevent many complications and will also help in markedly reducing mortality associated with this disorder. Effective management includes identifying and managing any precipitating factor. We report a case of DKA precipitated by thyrotoxicosis.

Case report

A 35-year-old woman had well-controlled type 1 diabetes mellitus for 10 years (HbA1c <7.5% throughout and no episodes of DKA). She was admitted with one week of pain abdomen, palpitation and worsening glycaemic control despite compliance with insulin and diet. She was dehydrated had low B.P (90/70 mmHg), had tachycardia (120 beats/min). She had glycosuria, ketonuria, capillary blood glucose 500 mg/dl, arterial pH 7.12, bicarbonate 12 mmol/l. Her blood count, liver enzymes, renal function tests, serum electrolytes, chest X-ray and electrocardiogram were normal. Blood and urine culture were sterile. General physical examination revealed goiter and persistent tachycardia and stare. USG thyroid suggestive of diffuse thyromegaly. The suspicion of thyrotoxicosis was confirmed biochemically, thyroid-stimulating hormone (TSH) was <0.001 uIU/ml, total T3 3.99 ng/ml (normal range 0.6-1.8 ng/ml) total T4 18.0 ug/ml (normal range 0.35-5.5 ug/ml). She was treated with intravenous fluids, insulin as per protocol and was put on oral propranolol and carbimazole (30 mg daily). She was discharged after one week and was on followup.

Discussion

Diabetic ketoacidosis is an acute complication of type 1 diabetes mellitus. A precipitating factor is not always found in more than half of patients. Many changes occur in carbohydrate, protein and fat metabolism in patients with thyrotoxicosis [1]. Deterioration of diabetic control with thyrotoxicosis could be due to enhancement of basal hepatic glucose production and its reduced suppressibility by insulin [2]. Other mechanisms that have been postulated include increased peripheral insulin resistance and insulin clearance [3]. In the absence of any other precipitating factors appearing after thorough investigation, we believe thyrotoxicosis was responsible for worsening glycaemic status and development of ketoacidosis in our patient.

Author's Affiliation: ¹Assistant Professor ²Senior Resident ³Professor, Dept. of Medicine, Government Medical College, Bakshi Nagar, Jammu, Jammu and Kashmir 180001, India.

Corresponding Author: Suman Kumar Kotwal, Assistant Professor, Dept. of Medicine, Government Medical College, Bakshi Nagar, Jammu, Jammu and Kashmir 180001, India.

E-mail: sumankk1230@rediffmail.com

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Nijs et al. Described increased insulin clearance in patients with insulin-dependent diabetes mellitus and thyrotoxicosis, which becomes normal with stabilisation of the thyrotoxic state [4].

Thyrotoxicosis increases lipolysis, both by a direct effect through the adenylate cyclase-cyclic AMP system and by sensitising adipose tissue to other lipolytic agents such as catecholamines, growth hormone, glyco-corticoids and glucagon [5,6].

Rolald et al. reported one case of DKA with thyrotoxicosis but the precipitating factor of DKA was omission of insulin for two days [7]. Our cases highlight the importance of a thorough search for precipitating factors in cases of DKA once common causes such as infection and omission of insulin are excluded. Although thyrotoxicosis is a very rare precipitating factor for DKA, persistent tachycardia in patients with DKA should raise the possibility of thyrotoxicosis.

Conclusion

Thyrotoxicosis should be considered as precipitating factor for DKA especially when patient has persistent tachycardia and thyromegaly.

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