



Case study

Scrub typhus initially manifested as diabetic ketoacidosis: A case report

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ABSTRACT

We report a case of a patient with scrub typhus who presented with diabetic ketoacidosis (DKA). The patient initially manifested with DKA, and was diagnosed with acute scrub typhus after evaluation the precipitating factors of DKA. No other complications of scrub typhus were noted. This case report suggests that acute scrub typhus should be considered as a precipitating factor of DKA, especially during the endemic season.

Introduction

The basic mechanism of diabetic ketoacidosis (DKA) is a relative or absolute state of insulinopenia [1]. Infections and noncompliance with treatment are the most common precipitating factors of DKA in patients with type 2 diabetes [1]. Together with vigorous fluid replacement and intravenous administration of regular insulin, prompt evaluation and management of the precipitating factors is necessary for a successful treatment [1,2].

Case presentation

A 54-year-old woman visited the emergency room (ER) with complaints of general weakness and fever. Her fever developed 7 days prior to admission, while a non-pruritic generalized skin appeared 2 days prior admission. Her blood pressure was 95/60 mmHg; pulse rate, 110/min; respiratory rate, 23/min; and body temperature, 38.2 °C. She was diagnosed with diabetes mellitus 7 years ago and was treated with insulin. However, recently, she received insulin on an irregular basis. She appeared acutely ill and was slightly drowsy. Her initial blood glucose level was 479 mg/dL. The results of the arterial blood gas test in room air were as follows: pH, 7.021; PCO₂, 11.6 mmHg; PO₂, 110.3 mmHg; HCO₃⁻, 6.6 mM/L; and anion gap, 31.3. Her serum lactate level was 25.3 mg/dL; ketone body was 11,560 μmol/L; and serum osmolarity was 318 mOsm/kg, which were strongly suggestive of diabetic ketoacidosis. A maculopapular rash on the trunk and a typical eschar on the right flank were noted upon physical examination (Fig. 1). She was clinically diagnosed with acute scrub typhus based on the time of disease onset (which was in November, an endemic season of scrub typhus in Korea) and acute fever with an eschar. Other laboratory test results were as follows: hemoglobin, 13 g/dL; white blood cell count, 10,960/

mm³; platelet count 210,000/mm³; protein, 7.1 g/dL; albumin, 3.0 g/dL; bilirubin, 0.27 mg/dL; alanine transaminase, 69 IU/L; aspartate transaminase, 61 IU/L; alkaline phosphatase, 646 IU/L; BUN, 23.8 mg/dL; creatinine, 0.58 mg/dL; sodium, 128 mEq/L; potassium, 5.0 mEq/L; erythrocyte sedimentation rate, 29 mm/h; adenosine deaminase, 112 IU/L; and CRP, 25.6 mg/dL. She received vigorous fluid replacement, intravenous regular insulin, and doxycycline. Her mental status rapidly returned to normal, and other symptoms began to improve within 48 h after admission to the ER. Results of blood and urine cultures obtained upon admission to ER were negative. Simple chest x-ray showed a mild bilateral pleural effusion, while abdominal computed tomography revealed no unusual findings. Antibody titers against *Orientia tsutsugamushi*, using an indirect immunofluorescent antibody assay, were > 1:5120. Patient had a serum hemoglobin A1c level of 16.7%, serum insulin level of < 0.200 uIU/mL, and C-peptide of 0.166 ng/dL. She was diagnosed with uncontrolled diabetes caused by an absolute insulin deficiency. Fortunately, diabetes-related complications such as neuropathy, retinopathy, and nephropathy were not observed. She was discharged 9 days after admission and was prescribed with oral hypoglycemic agents with regular insulin. Patient was free of symptoms after 3 months of taking regular insulin and oral hypoglycemic agents, such as linagliptin (Trajenta® 5 mg) and metformin (Glucophage® 500 mg). Patient's serum hemoglobin A1c levels decreased to 7.1%.

Discussion

Previously, two cases of scrub typhus complicated by DKA were reported separately [3,4]. All patients presented with acute respiratory distress syndrome, and one patient developed Guillain-Barré syndrome [3]. The present case had type 2 diabetes for 7 years. DKA occurred due to noncompliance with treatment. Upon evaluation of precipitating

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Fig. 1. Eschar on the right flank.

factors of DKA, acute scrub typhus was detected. Patient did not

develop other complication of scrub typhus. In Korea, seasonal variations of scrub typhus occur in patients with fever, which peak from October to November [5]. Acute scrub typhus should be considered a precipitating factor of DKA, especially during the endemic season.

Declaration of interest

None.

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