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CASE REPORT: A 56 YEARS OLD FEMALE WITH UNCONTROLLED DIABETES MELLITUS TYPE II, PNEUMONIA, AND SUSPECT WITH LUNG ABSCESS

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ABSTRACT

Background: Diabetes mellitus is a group of metabolic diseases with characteristic hyperglycemia. In 2021, there were 536,6 million cases of diabetes mellitus globally, with 6,7 million mortality cases. Proper management of DM patients is essential, and this is useful for controlling appropriate blood glucose levels. If blood glucose levels are uncontrolled, this lead to other complications in other organs, like interference with the immune system, which occurs in many women is 55,1%. Disruption of the immune system causes the risk of infectious diseases, such as pneumonia and lung abscess. **Case Presentation:** We report a female patient with a history of type 2 diabetes mellitus, complaining of dyspnea, cough with sputum, high fever, and headache. On chest examination showed left chest movement in the right lung, increased stem fremitus in all right lung fields, dullness in the right upper lung field, and amphoric sound, coarse and wet crackles heard in the right upper lung. Several supporting examinations, including laboratory and radiological examinations were carried out. **Conclusion:** The patient was diagnosed with uncontrolled type 2 diabetes mellitus, pneumonia, and a suspected lung abscess. The patient was given several treatments and showed clinical improvement on the fifth day of treatment.
***Keywords**:* Abscess; control; hyperglicemia; infection; radiology

INTRODUCTION

Diabetes mellitus is a major uncommunicable disease that causes personal and global health problems. Uncontrolled diabetes may progress to micro- and macro-vascular complications that are difficult to manage. Every diabetes patient with micro- or macro-vascular complications may contribute to a social and financial burden to their country. The percentage of diabetics with complications the most in women is 55,1%.[1,2] In 2021, there were 536,6 million cases of diabetes mellitus globally, with 6,7 million mortality cases. These numbers were predicted to increase up to 783 million in 2045.[3,4]

Diabetes mellitus may be a predisposing factor for other diseases, such as pneumonia. Pneumonia is an acute infection of lung parenchyma caused by bacteria, virus, fungi, and parasite.[5] If not properly treated, pneumonia could lead to other complications such as lung abscess.[6] Lung abscess is a destructive infection characterized by a localized necrotic lesion on lung tissue, forming a cavity containing pus in lung parenchyma on one or more lung lobes.[7]

This article reported a case with uncontrolled diabetes mellitus accompanied by pneumonia and suspected lung abscess. This article aims to be material for further study on the diagnosis and treatment of the disease.

CASE REPORT

A 56-year-old female patient came to the emergency department complaining of dyspnea. The patient experiences sudden dyspnea, starting three days before her hospitalization and worsening until the day she is hospitalized. Continuous dyspnea worsens during moderate activity. Dypsnea hinders the patient's ability to perform moderate and intense activities. This symptom decreases when the patient rests and sleeps in a semi-sitting position. The patient also complained of a cough with sputum, a 10-day-long high fever, headache, and weight loss for six months, but had a good appetite. According to the anamnesis, the patient also suffered from uncontrolled diabetes mellitus for six months. The patient said that when she first found out she had diabetes, the patient took medicine from the primary care, but the patient forgot the name of the medicine, after that the patient had never taken any medicine for six months, because she felt that she was healed and there were no complaints. Based on family history, the patient's mother also had diabetes.

Physical examination showed the patient was compos mentis ($E_4M_6V_5$), with blood pressure 120/70 mmHg, heart rate (HR) 80 times/minute-regular, axilla temperature of 38,6°C, visual analog scale (VAS) 2, and body mass index was underweight (17,99 kg/m^2). General examination was within normal, except for conjunctival pallor (+/+). On the

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chest inspection, there was left chest movement in the right lung, palpation showed increased stem fremitus in all right lung fields, percussion of the lung was dullness in the right upper lung field, and the auscultation were amphoric heard in the patient's right upper lung at SIC 2 to 3; coarse and wet crackles in the right upper lung at the level of SIC 4 to 5.

Laboratory examination showed decreases in hemoglobin (10,47 gr/dl, with normal range in our hospital 13,0 – 18,0 gr/dl) indicating anemia, hematocrit (33,03%, with normal range in our hospital 37% – 47%), MCV (65,16 fl, with normal range in our hospital 79 – 99 fL), MCH (20,66 pg, with normal range in our hospital 27,0 – 31,2 pg), and MCHC (31,70 gr/dl, with normal range in our hospital 33,0 – 37,0 g/dl). We found an increase of leukocyte (14,340/µl, with normal range in our hospital 4 – 11 x 10^3) showing leukocytosis, random blood glucose (437 mg/dl), fasting blood glucose (184 mg/dl), 2-hours postprandial blood glucose (270 mg/dl), and HbA1c 12,3%. Based on chest X-ray, normal trachea, located in the central. There were infiltrates in both lung fields and a cavity in the right lung. In addition, CTR was <0.50 with slippery bilateral diaphragmatic surfaces and sharp bilateral costophrenic angles. Based on the chest radiograph, the conclusion was pneumonia with suspected lung abscess formation in the right lung (Figure 1). Electrocardiography (ECG) showed normal sinus rhythm with LAD, PR interval was within normal, short QRS Complex, no hypertrophy of atrial and ventricular, no ST elevation and T inversion, and poor R wave progression. The conclusion was old myocardial infarction anterior (Figure 2). Based on anamnesis and examination results, the patient was diagnosed with uncontrolled diabetes mellitus type II, pneumonia, and suspect lung abscess.

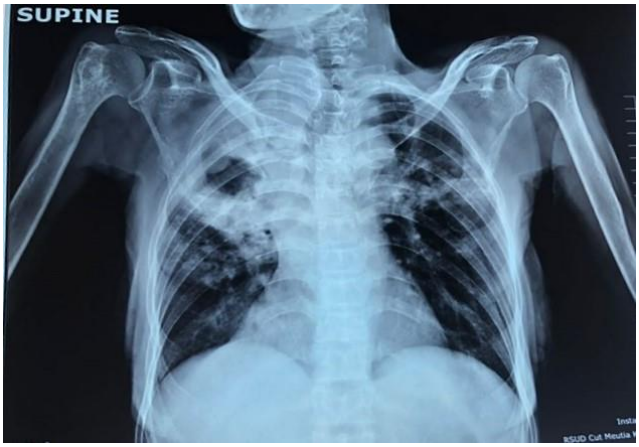

Figure 1. Chest radiograph showed pneumonia with suspected lung abscess formation in the right lung

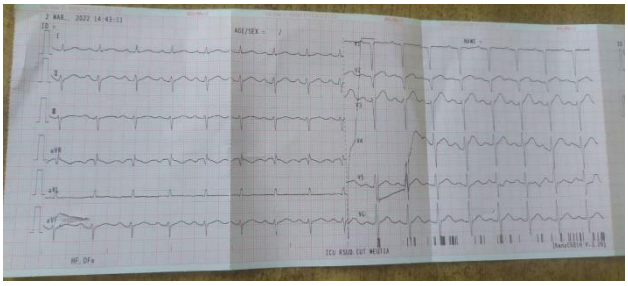

Figure 2. ECG showed OMI anterior.

The patient received several treatments, including ceftriaxone, omeprazole, ondansetron, novalgin, novorapid injection 12-12-12, levemir injection 0-0-14, paracetamol, and neurodex. The patient's complaints decreased on the fifth day of the patient's hospitalization. We switched therapy from antibiotic IV to oral antibiotic therapy with cefixime, and the patient received outpatient care.

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DISCUSSION

The 56-year-old female patient complained of dyspnea for three days prior to her hospitalization. In addition, the patient complained of a cough with sputum for the past ten days, fluctuating fever, and headache. According to the anamnesis results, the patient also suffered from Diabetes Mellitus for six months uncontrolled. Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia, which is diagnosed by measuring blood glucose levels due to defects in insulin secretion, insulin action, or both.[8] The incidence of DM in the world tends to occur in adulthood (20–79 years of age), and males are more likely to receive a diagnosis of diabetes than females.[9]

Based on the anamnesis and physical-supporting examinations, the patient was diagnosed with uncontrolled DM type II, pneumonia, and a suspected lung abscess. Blood glucose levels, HbA1c, lipid profile, blood pressure, and nutritional status were the determinants of DM control criteria.[10] These criteria were used to diagnose our patients, where we found elevated random blood glucose levels, fasting blood glucose, 2 hours postprandial blood glucose, and HbA1c.

Pneumonia is common in patients with uncontrolled diabetes mellitus. Based on the literature, hyperglycemia causes an increase in oxidative stress and disturbances in the immune system, like delaying hypersensitivity reactions, lymphocyte transformation, and granuloma formation, which results in changes in immune mechanisms so that DM patients are more susceptible to pneumonia.[11]

Based on patient and environmental factors, pneumonia is divided into community-acquired pneumonia, nosocomial pneumonia, recurrent pneumonia, and pneumonia in immunocompromised patients.[12] Community-acquired pneumonia is acquired from the community.[5] The likelihood of contracting community-acquired pneumonia increases with age. According to fundamental health research in Indonesia, the peak prevalence of pneumonia diagnosed by physicians occurs between the ages of 65–74, followed by 54–64.[13] This results from immunosenescence, a process in which the adaptive and innate immune systems lose effectiveness.[14] This literature's findings are consistent with our patient.

The diagnosis of pneumonia is based on clinical findings and supporting examinations, including the presence of infiltrates or air bronchogram on the chest radiograph and several symptoms like cough, changes in sputum characteristics, rise in body temperature or fever >38°C, chest pain, and shortness of breath. In addition, the examination revealed signs of consolidation, bronchial breath sounds, crackles, leukocytosis, and leukopenia.[5] This is consistent with the findings in our patient, which indicate infiltrates on chest radiography, leukocytosis, and the physical examination revealed cough with sputum, fever, and consolidation signs.

As a treatment, patients were administered ceftriaxone IV, omeprazole, ondansetron, novalgin, novorapid injection, levemir injection, paracetamol, and neurodex. Following the literature, IV beta-lactam plus macrolide antibiotics can be administered to hospitalized inpatients. A single-agent broad-spectrum antibiotic is administered to a patient who is initially healthy and whose clinical presentation is suggestive.[12] Antibiotics are administered either intravenously or orally for at least five days. In community-acquired pneumonia, the criteria for switching from injectable to oral medications are stable hemodynamics, improved clinical symptoms, the ability to take drugs orally, and normal gastrointestinal function.[5]

CONCLUSION

Diabetes mellitus is a non-communicable metabolic disease characterized by increased blood glucose. Diabetes can be a trigger for other comorbidities, such as pneumonia. Pneumonia, accompanied by diabetes, makes it easier for other complications, such as lung abscesses, to occur. In this case, a 56-year-old woman, based on history, physical examination, and supportive examination, had uncontrolled type 2 DM with pneumonia and a suspected lung abscess. The patient received treatment at the hospital for five days and the patient's condition improved so he could be treated as an outpatient.

ETHICAL APPROVAL

There is no ethical approval for this case report.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest for this reported case report.

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There is no specific funding was provided for this case report.

AUTHOR CONTRIBUTIONS

Investigation, Sri Meutia, Fahreza and Diana Novita; data collecting and writing–original draft preparation, Fahreza and Diana Novita; writing–review and editing, Sri Meutia

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