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Case Study

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Handling diabetic patients with septic shock condition, AE-COPD, and HAP pneumonia given fluconazole infusion: A case report

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Abstract: Chronic obstructive pulmonary disease (COPD) is a disease characterized by abnormalities in ventilation, including disturbances in the airflow channel. In case this patient is 58 years old with a diagnosis of chronic obstructive pulmonary disease, acute exacerbation (COPD AE), Heart Failure (HF), Coronary Artery Disease (CAD), Hypokalemia, Hypoalbumin. When treated in the intensive care unit (ICU) patient experiencing HAP pneumonia and septic condition, with blood sugar at 324 mg/dl, and use insulin later in an empirical patient treated with antifungal Fluconazole infusion, from the drugs used, researchers need to examine whether fluconazole and insulin are used in the therapy of septic conditions with diabetes. After conducting a literature review of the use of fluconazole infusion and insulin in patients with septic condition cases, things This done to prevent the occurrence of death in patients treated in the ICU. Fluconazole and insulin in the treatment of ICU patients with septic conditions have an appropriate level for preventing death.

Keywords: COPD AE, Pneumonia HAP, Septic Condition, Fluconazole, Insulin.

INTRODUCTION

Disease lungs obstruction chronic (COPD) is Wrong One disease or disturbance lungs that provide abnormalities ventilation in the form of disturbance obstruction channel breath. Disturbance obstruction, which happens, has a bad to sufferers because it causes disturbance to oxygenation with all its impacts. An obstruction of the respiratory tract that occurs can increase heaviness. If there is a disturbance, such as an infection, respiratory tract infection, or exacerbation I his illness. It is estimated that millions more suffer from the disease. Most people with COPD are 40 years old. or more. Comorbidities related to COPD include ischemic heart disease, osteopenia, osteoporosis, and fractures; cachexia and malnutrition; normochromic anemia, normocytic; shrinkage of the muscle framework and dysfunction of the peripheral; diabetes mellitus; disorders of sleep; cataracts and glaucoma; cancer of the lungs; and anxiety and depression, both of which increase the incidence of severe disease.[1]

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Sepsis is a threatening condition defined by organ dysfunction caused by the body's response to infection.[2] Patient with COPD reported their own risk was more affected by sepsis due to the use of corticosteroids, underlying comorbidities, and possible disturbance function barrier.[3]

Sepsis syndrome includes a clinical condition with varying prognosis. Shock, septicemia, and the most severe complications of sepsis can cause a high mortality rate. Shock septic happen as a response to an agent trigger, which causes activation of the pro-inflammatory and anti- inflammatory immunity. This happens simultaneously with the activation of monocytes, macrophages, and neutrophils, which interact with endothelium through receptors introduction pathogens and causing the involvement of cytokines, proteases, kinins, reactive oxygen species, and nitric oxide nitrate more continue.[4] Various variables and tools are clinically used for sepsis screening, such as criteria syndrome response inflammation systemic (SIRS), vital signs, signs of infection, Quick Sequential Organ Failure Score (qSOFA) or Sequential Organ Failure Assessment (SOFA) criteria, National Early Warning Score (NEWS), or Modified Early Warning Score (MEWS).[5,6]

Giving antifungal intravenously is one of the procedures fundamental to sepsis. *The Surviving Sepsis Campaign* (SSC) recommends antifungal must be given quick in time one hour after the patient is diagnosed with sepsis for reduce the risk of death.[7] Related factors with side effects and death in sepsis patients are the initiation of therapy with antifungal agents that are no the right ones, and late therapy with the right antifungal agents. Based on impacts that can occur in therapy, an antifungal that has not been studied to evaluate the accuracy of fluconazole infusion therapy in hospitalized sepsis patients to be able to reduce the length of stay at the hospital.[8,9]

MATERIAL AND METHOD

Design Study

This study is an analytical case report using a case report design to analyze insulin and antifungal use in sepsis patients.

Sample and Data Collection

The sample used was patients treated in the ICU with diagnoses of sepsis, COPD, and HAP pneumonia. Patient data collection techniques were obtained through electronic searches of patient medical records and laboratory data.

CASE REPORT

A man 58 years old came to the emergency room with a complaint of congested breath, loss of appetite for 1 month, and had been getting heavier for 1 day after entering the hospital. First Patient since 2020 and maintained by the department's lungs. Patient treated by a specialist, heart monitor and has undergone several inspections. It is said the heart rhythm is irregular. Patients receive regular treatment from a doctor specializing in the lungs and do not seek medical treatment, and return to the doctor specializing in the Heart. History of swollen feet (-), palpitations (-), chest pain (-), fainting (-).

Patient treated several times by the doctor. Syaiful Anwar Hospital (RSSA) and Hospital B. After going home, the patient continued control by a doctor specializing in lungs, and several times the patient sought medical treatment with a doctor specializing in the heart. However not routine. Since August 2022, patients have received regular treatment from a heart specialist at Hospital B and received Furosemide 40-40-0, Candesartan 0-0-8mg, Clopidogrel 0-80-0, Bisoprolol 5 mg-0-0, and Spironolacton 25 mg-0-0. The patient also had to get Other drugs, including PO. Lasix 20-0-0, Angintriz 1-0-1, Clopidogrel 75-0-0, Tinov 0-40-0. August 2022 patient complained of chest pain, worsening when tilted to the right,

heavy moment activity, and weight moment lying down. Shortness of breath gets better when the patient tilts to the left and when sitting, tilts to the left and right.

Patient was treated at Hospital C for 11 days (2 days in ICU, 9 days in the room). Given IV Moxifloxacin, acetyl cysteine, Spiriva, and Symbicort. Patient sent home yesterday, and in the morning this day (1 day after being discharged from our hospital), the patient returned to the emergency (ER), hospital because of shortness of breath. In the emergency room, they gave a drug in the form of an injection. Lasix 2 amp, nebul combivent 1 resp, inj. Santigent 1 amp, po lodia 2 tabs, urine - 2000cc in 10 hours.

Patient entered the Emergency Room with signs: and vital signs temperature 36^{o}C, pulse 111 (x/minute), blood pressure 120/80 mmHg, Spo2 98% with Oxygen 6 Lpm, shortness of breath +, cough +, weakness +. Laboratory data white blood cell (WBC) 12.63 10^3/. uL, Hemoglobin (HGB) 11.30 g/dl, red blood cell (RBC) 3.78 10^6/ uL, hematocrit (HCT) 33.90%, Neutrophils 75.90%. Chemistry data blood albumin 2.77 g/dL, urea 15.3 mg/dl, creatinine 0.65 mg/dl, examination Electrolytes: sodium 136 mmol/L, potassium 3.38 mmol/L, chlorine 105 mmol/L, blood gas analysis patient potential hydrogen (PH) 7.57, Pco2 48.8 mmHg, Po2 234.4 mmHg, HCO3 45 mmol/L, spo2 99%, results other supports are chest x-ray on the day the 7th states that patient suffering from pneumonia and emphysematous lung, early come in House Sick patient diagnosed with COPD AE, Atypical Pneumonia, HF and hypertensive heart disease (HHD), hypokalemia, Prolonged hemostasis (FH) and Hypoalbumin moderate, condition patient No experience repair during treated in the high care unit (HCU) even patient worsening with increasing tightness aggravate so that cause difficult sleep and restlessness. On the 5th day of treatment in the HCU room, the patient's condition worsened, becoming congested, heavy, pulse increasing to 131 x/ minute, Respiratory rate (RR) 28 x/ minute, and the patient experienced a decrease in glaucoma scale (GCS), so the patient must undergo care in the ICU.

When a patient is treated in the ICU with drug sedation, complications of the condition aggravate with diagnosis, namely septic shock and HAP pneumonia, which is getting worse. Because of antibiotic resistance, the early use of antibiotics is levofloxacin 1 x 750mg. condition patient No improve and cause infection systemic so that develop become a septic condition, On the day 5th moment moved to ICU blood sugar condition patient increase to 294 mg/dl and still not yet given therapy additional blood sugar patient the more increase the more increased by the day to 8 with blood sugar level 324 mg/dl and still not yet get therapy regarding increased blood sugar. When the patient is in the ICU, the patient receives maintenance with ventilator support and vasopressor support to stabilize the patient's blood pressure. On the 11th day, I added meropenem antibiotic 3 x 1 g as needed with culture results to prevent the severity of sepsis in patients.

RESULTS AND DISCUSSION

Development of case patient sepsis begins from worsening COPD condition with several severe and worsening pneumonia worsening due to the existence of antibiotic resistance. The signs of sepsis are conditions that are experienced by patients, measured based on sofa score, experienced patients in the ICU room, namely, consisting of the system with Pco2 measurement of 48.3 mmHg, the nervous system with decreased patient GSC measurement to be 1-1-1.

According to research conducted by *Kim* et *al.,* which states that disease is critical, such as severe sepsis or septic shock, marked with disturbances in homeostasis that result in injury to multiple organs and irreversible organ dysfunction.[9] One of the reasons in cases of sepsis with pneumonia is infection weight that occurs in the parenchyma lungs caused by several organisms like bacteria, viruses, fungi, and parasites, which result in inflammation of the parenchyma lungs (alveolitis).

On the guardline sepsis therapy, which is written in critical care medicine, there are many Therapies used in sepsis, including the use of antibiotics, antifungals, insulin if GDA > 180, and inotropic agents to reduce mortality in patients treated in intensive care units. Some studies observations show that proper initiation of antifungal therapy and proper empirical treatment can be associated with a decline in the number of deaths. Continuity survival in sepsis patients with pneumonia who use fluconazole therapy intravenously can lower the development of organ failure and mortality. Mechanism work of fluconazole in reducing multiple organ dysfunction in the group patient. This can be mediated by modulation of adhesion neutrophils as well as improved recruitment and improved function of cells, and can lower the number of significant mortalities.[2,10] In sepsis conditions in the ICU, patients are given Fluconazole with a 1x 400 mg dose at the start of use, and then 1 x 200mg daily intravenous sepsis treatment is carried out. Already in accordance with sepsis therapy in several guidelines and research. On day 12, the patient's WBC levels decreased from 15.07 10^3/uL to 13.58 10^3/uL. Vital signs improved with pressure. Blood pressure 113/62 mmHg, pulse 98 x/ minute, respiratory rate 20x/ minute, temperature 36.8°C, SpO_2 99%. And procalcitonin value 0.39 ng/ml.

Sepsis indicates a condition hypercatabolic beginning with hyperglycemia, and in the phase, it carries on a condition hypocatabolic with hypoglycemia, because of changes in metabolism in the liver and depletion of protein reserves.[11,12] Response to the incident pathological I marked with activation of the neuroendocrine system, with the consequence improvement of stress hormones called: glucocorticoids and catecholamines. Cortisol causes hyperglycemia Because improvement release from the heart through activation of enzymes involved in glycogenolysis and decreases insulin sensitivity in the muscle frame.[13] Endogenous catecholamines, as well as exogenous ones given as part of treatment, in part, induce gluconeogenesis and stimulate glycogenolysis in the liver.[14] During sepsis, pro-inflammatory cytokines such as TNF-α, IL-1α, and IL-6, which work synergistically, increase the level of plasma glucose. In addition to the increased availability of glucose, insulin resistance is characterized by the inability to inhibit hepatic glucose and, at the peripheral level, by changes in signaling downstream receptors for glucose and insulin and decreased insulin translocation. GLUT-4 to the plasma membrane.[15] In some related research with handling hyperglycemia in sepsis in the International Guidelines for Management of Sepsis and Shock, the Sepsis Campaign recommendations. This is for starting insulin therapy when two values are observed: glucose blood > 180 mg/dL, and the goal of treatment is to maintain the mark glucose blood between 140-180 mg/dL. In turn, the emphasis is to avoid hyperglycemia, hypoglycemia, and also fluctuations in glucose levels, because this is associated with improved mortality.[2] When the patient's GDA reached 324 mg/dL on the day to 8 doctors use insulin therapy with dose Lantus 1 x daily 10 IU at night and Novorapid 3 x 4 IU from therapy received by the patient Already experiencing progress in lowering blood sugar in a way gradually from day 8th 324 mg/dL to 258 mg/dL for blood sugar reduction target Not yet achieved but the food that is served Already appropriate with using insulin. But should insulin administration be given in a way intravenously? Ideally, patients who experience multi-pressor shock should use intravenous insulin infusion to avoid related issues with malabsorption of subcutaneous insulin.[16]

As the prevalence of intensive insulin therapy in ICUs increases[17], the “Surviving Sepsis Campaign Guidelines” recommend that we be on guard against a series of problems during intensive insulin therapy. Especially, the signs and symptoms of hypoglycemia in a critically ill patient can be misconstrued as another diagnosis, leading to a delay in recognizing the hypoglycemia.[18,19,20] A large multicenter analysis evaluating the trend in early BG (within 24 h of ICU admission) and the relationship between blood glucose control and hospital mortality found

that both hypoglycemia and hyperglycemia were harmful to critically ill patients.[21] Although both high and low blood sugar levels increase the risk of death hypoglycemia may sometimes be more dangerous.[22] For example, it may be associated with increased severity and higher mortality in patients with severe sepsis.[23] Therefore, it is necessary to analyze the risk factors for hypoglycemia in sepsis patients receiving intensive insulin therapy, so as to determine a blood glucose range for each ICU that does not cause a significant increase in severe hypoglycemia.[24]

Intensive insulin therapy can reduce intensive care resource utilization and the risk of complications common in patients requiring intensive care, including septicemia and the need for prolonged antibiotic therapy. The higher risk in the conventional treatment group may reflect the detrimental effects of hyperglycemia on macrophage or neutrophil function.[25-28] or insulin-induced trophic effects on the mucosal and skin barriers. Intensive insulin treatment also prevents acute renal failure. Beyond optimizing hemodynamic status, no other strategy for preventing renal failure has proven effective.[29-32]

The reduced number of transfusions in the intensive treatment group may reflect improved erythropoiesis or decreased hemolysis, as these benefits are associated with a lower incidence of hyperbilirubinemia. Intensive insulin therapy may reduce the risk of cholestasis, as adequate glucose and insulin delivery to hepatocytes is essential for normal cholestasis.[33,34]

Sepsis due to infection is the most common cause found in the ICU and is closely associated with poor outcomes. Infection mold is associated with number death height, time in ICU care, and longer ventilator use. antifungal medication, proper empirical treatment is associated with a decline in mortality. Research. This aim is to analyze the connection between the use of antifungal with length of stay, ventilator use, and mortality in sepsis patients. So expected with the existence report case. This can become a reference more carry on in confectionery sepsis cases in the ICU.

CONCLUSION

Sepsis can cause hyperglycemia and stress, which may need improvement in the temporary insulin dose. During infection, getting better after administration of fluconazole, insulin sensitivity can increase, so that the required adjustment to the insulin dose for prevent hypoglycemia. Fluconazole can influence liver and kidney function in some patients, especially if there are organ disorders that have already occurred. This is due to sepsis. Changes in the function of this organ can impact insulin metabolism and excretion, which can influence the need for insulin. So that Combination. The use of fluconazole and insulin in ICU patients with septic conditions has been appropriate for prevent level death.

AUTHORS' CONTRIBUTIONS

Dhimas Aditya and Rani Nur Badriyah are taking research data and writing a journal. This is Reta Anggraeni choose cases at home illness that can be used as report cases, as well as a guide for writing a journal. Jainuri Erik Pratama, Marisca Evalina Gondokesumo, Adji Prayitno Setiadi, and Fauna Herawati review and supervise the journal all of them. The writer has read and agree journal end.

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The utilized data to contribute to this investigation are available from the corresponding author on reasonable request.

DISCLOSURE STATEMENT
The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any affiliated agency of the authors. The data is the result of the author's research and has never been published in other journals.

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