

Development of Sepsis in a Patient Admitted to the Detox Unit for Opioid Abuse: A Case Report

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Abstract

Patients with opioid or benzodiazepine use disorder will often check themselves into a detox unit to combat withdrawal symptoms. These symptoms can include tachycardia, diaphoresis, and gastrointestinal upset. Unfortunately, these symptoms often mask the symptoms of other serious conditions, such as sepsis. The development of sepsis is observed in patients with substance use disorder, specifically those who abuse IV drugs. If unaddressed, this can progress to septic shock, a condition associated with significant mortality due to end organ damage and hemodynamic decompensation. This case presents a patient admitted to the detox unit for opiate use who had been admitted several times within the last year. She was treated for withdrawal symptoms for two days before it was discovered that she was septic. This case highlights the importance of recognizing acute conditions such as sepsis in the context of experiencing symptoms secondary to opioid withdrawal in patients admitted for substance detox.

Keywords: IV drug user, opiate withdrawal, sepsis, addiction medicine

1. Introduction

As a patient population, IV drug users are at increased risk of developing blood-borne diseases such as HIV and Hepatitis C, endocarditis, and vascular complications (1). Furthermore, there is a higher prevalence of soft tissue infection and chronic, non-healing wounds due to behavioral factors and the physiological response to the injected substance. More specifically, repeated injection into the same area causes vascular trauma and can introduce bacteria into the bloodstream and soft tissue.

Additionally, use of vaso-constricting drugs, such as cocaine, can lead to vasospasm or chronic venous insufficiency, resulting in non-healing ulcers or tissue necrosis (2). Complications of non-healing ulcers include development of sepsis, often defined by the systemic inflammatory response syndrome (SIRS) criteria, requiring elevated or decreased temperature, leukocyte count, tachycardia, and tachypnea in the setting of a suspected source of infection. Laboratory findings include lactic acidemia, bandemia, hyperglycemia, thrombocytopenia, and renal dysfunction (3). This can progress to multiorgan dysfunction syndrome (MODS), presenting with altered mental status, hypoxia, ileus, and kidney dysfunction. Overall, early identification of sepsis is critical in assuring rapid treatment administration and preventing mortality.

Unfortunately, in the setting of an inpatient detox unit, the earlier signs of sepsis overlap with the sympathetic hyperactivity symptoms caused by commonly abused depressants such as opiates and benzodiazepines. Symptoms of opiate withdrawal tracked by the COWS scale include tachycardia, hypertension, anxiety, temperature changes, GI upset, sweating, body aches, and tremor (5). Benzodiazepine withdrawal can present as irritability and anxiety, tremor, sweating, concentration impairment, nausea, palpitations, and body aches (5).

We describe a patient who is an IV drug user with a non-healing leg wound suffering from septic shock caused by MRSA, whose presentation was complicated by symptoms of polysubstance withdrawal.

2. Case Presentation

Patient Information

Age: 42 years old. Gender: Female.
Ethnicity: Caucasian. Related Problems: opioid use

disorder, post-traumatic stress disorder (PTSD), generalized anxiety disorder (GAD), non-healing wound on leg.

Objective for Case Reporting

Our aim is to present a case of a patient admitted to the detox unit for opioid withdrawal developing sepsis. Physicians should be aware of the increased risk of sepsis in IV drug users and the similarity of the initial symptoms of sepsis and withdrawal.

Case

A 42-year-old female with a past medical history of opioid use disorder, PTSD, GAD, Iron Deficiency Anemia, and a non-healing wound on her leg. She reported using 0.5-1g of heroin via IV daily. She had a previous history of using fentanyl also through IV. Although this was a reoccurring patient, her most recent visit was one month prior to the writing of this manuscript.

She has a three-year history of non-healing lower left leg soft tissue injury. In 2021, she was prescribed a course of IV antibiotics due to concern of infection, but left against medical advice before the course was completed. She did not receive antibiotics or any other treatments for the non-healing leg wound. She expressed that she would keep it covered throughout the day and reported no changes in size or appearance. It was most recently examined during a hospitalization two months prior for opiate dependence and withdrawal. At that time, the wound was observed to be healing and no antibiotics were prescribed.

During the first day of hospitalization, she reported anxiety, body aches, rhinorrhea, lacrimation, and general weakness consistent with opioid withdrawal symptoms. She was given symptomatic medications at this time per the COWS scale. She was mildly tachycardic at 112 bpm, had a blood pressure of 90/45, and asymptomatic oxygen desaturation to 87-91% which was easily correctable with breathing coaching. The hospitalist service rounded on her during the first day of hospitalization and did not express concern for sepsis due to her being afebrile. Wound care did not clean the leg wound due to her being asleep. Notable lab results included a decreased RBC count (3.55 million/mm³), hemoglobin (10.4 g/dL), and hematocrit (31.9%), values all consistent with mild anemia. There were mild decreases in WBC count (3.85×10⁹/L), relative neutrophil count (31.7%), and absolute neutrophil count (1.22 x 10³). Blood glucose was measured at 154 mg/dL, and the

relative lymphocyte count was mildly elevated (53%). Lactic acid was within normal limits (1.3 mmol/L). Testing confirmed she was HIV, Hep B, and Hep C negative.

Day two of hospitalization, she presented with the same complaints of withdrawal and symptomatic medications were continued. Her blood pressure was measured at 97/54, and her heart rate was 117 bpm. She denied both chest pain and shortness of breath and was still afebrile. Medicine was consulted for this, and tachycardia was considered consistent with withdrawal. As the day progressed, she developed a fever of 102 °F. The medicine team was consulted for concerns of sepsis. The wound was examined and thought to be infected. Therefore, IV cefepime and IV vancomycin were initiated, and blood was drawn for culture. She was discharged from the detox unit at this time and sent to the general medicine unit. CBC revealed a sharp increase in WBC count (10.68×10^9), relative and absolute neutrophilia (83.5%, 8.91×10^3 , respectively), and lactic acid (2.6 mmol/L). There was a correspondingly sharp decrease in relative lymphocyte count (11%), and a moderate decrease in blood glucose to 115 mg/dL. Neutrophil to lymphocyte ratio (NLR) increased from 0.59 on day one to 7.6 on day two. RBC count remained low.

She was treated in the medical unit for three days with IV vancomycin. The IV cefepime was discontinued after blood culture results were positive for clindamycin-resistant *Staphylococcus aureus* and *Streptococcus agalactiae*. Infectious disease was consulted and recommended the 3-day treatment with vancomycin. Both were worked up and determined to be treated properly with the IV vancomycin. The wound was kept clean throughout her stay and demonstrated early signs of the healing process. She was discharged with a 10-day course of cephalexin 1000 mg TID. She was advised to follow up with infectious disease, wound care, and plastic surgery for a potential skin graft. Unfortunately, she was lost to follow up with no evidence of going to appointments with infectious disease, wound care, nor plastic surgery.

3. Discussion

Oftentimes, providing supervised withdrawal care for patients who are IV drug users is already complicated by comorbid conditions, unstable living conditions, and broad withdrawal symptoms. For example, a study performed in Baltimore, MD found up to 38% of current and former IV drug

users reported homelessness on at least one occasion. (6). Our patient has a similar social history of having inconsistent housing status, food insecurity, and financial instability. When combined with impaired absorption and physiologic anorexia secondary to intoxication and withdrawal, these socioeconomic factors greatly increase the risk of iron deficiency and anemia, consistent with our patient's presentation (7). Nutritional deficiencies and chronic anemia could also be contributory to the non-healing ulcer with a 3-year history, predisposing patients to infectious etiologies in an already vulnerable state.

Both sepsis and opiate withdrawal are characterized by broad symptoms which can be difficult to disentangle, especially with comorbid conditions such as iron deficiency anemia masking diagnostically relevant laboratory values. Notably, many symptoms of septic shock overlap with opioid withdrawal, including tachycardia, chills, and nausea (8). The patient presented with a symptomatic profile that was characteristic of opiate withdrawal: tachycardia, anxiety, body aches, rhinorrhea and lacrimation, and general body weakness. However, due to her low blood pressure, asymptomatic decreased hematogenous oxygen transport (SpO₂ 87-91%), and the persistence of her chronic wound, further testing was performed to rule out systemic inflammation.

The second day of hospitalization, this symptomatic trend continued apart from fever. Further testing included elevated lactic acid measurement and increased WBC count. Due to concerns of sepsis, IV antibiotics were started while blood cultures were pending. Throughout both days, the patient could ambulate without problems, and she was monitored closely for changes in vitals. Her rapid symptomatic decompensation and the well-documented mortality risk for sepsis indicate the importance of thorough examination and rapid diagnosis. In patients where withdrawal may mask characteristic symptoms of sepsis- such as tachycardia and tachypnea, alternative diagnostic tools are critical. These include fever, suspected source of infection, and monitoring of changes in CBCs with differentials, specifically WBC count, RBC count, and NLR (9). Total leukocyte count, or WBC, is an identifier of systemic inflammation yet has low specificity for sepsis due to the wide array of conditions involving increased WBC count, and irregular response to infection. This is reflected in the SIRS criteria specifically allowing for leukopenia less than 4,000/cu mm, leukocytosis

greater than 12,000/cu mm, or bandemia defined as greater than 10% (3). However, total WBC counts may remain within normal parameters. Bands, immature granulocytes stimulated by cytokine release during systemic inflammation, are another leukocyte value traditionally associated with sepsis. However, the delay in measurable left shift of approximately 24 hours following infection can impede diagnosis (10). In summation, while abnormalities in the total leukocyte count may be indicative of infection, normal values cannot rule out sepsis definitively.

Subsets of leukocyte cell populations are more specific. In early sepsis, lymphocytopenia is driven by apoptosis and may predict poor clinical outcome, while neutrophil counts are expected to increase in relation to the infection's severity (9). Much like lymphocytes, however, neutrophil count in isolation lacks specificity. Alternatively, increases in the neutrophil to lymphocyte ratio have proven to be more specific to rapid inflammation response compared to their individual values (9). The NLR value will be notably elevated in sepsis, as the biological stress of sepsis will increase neutrophil proliferation while decreasing lymphocyte count via apoptotic mechanisms. While the NLR cannot discriminate between sources of infection, elevation above 3 can be a reliable measurement of severe inflammation in a shorter timeframe than bandemia (10). Sepsis is additionally correlated with a decrease in RBCs, hemoglobin, and hematocrit. However, without baseline values prior to hospitalization, it can be difficult to extrapolate iron deficiency anemia or anemia of chronic disease from a more acute process. Other markers such as hyperglycemia, lactic acid, and renal dysfunction should also be used to identify sepsis in otherwise complicated patient presentations (3).

4. Conclusion

This case report demonstrates that in patients with substance abuse disorder, the broad array of intoxication and withdrawal symptoms can mask critical comorbid conditions and worsening disease states. Oftentimes these symptoms are deduced as being caused exclusively by the withdrawal. This proves extremely dangerous for patients as they may not receive adequate healthcare. Sepsis presents with a high mortality rate and inflammatory damage to nearly every organ system (11). For this reason, it is critical that sepsis be diagnosed and treated early in presentation.

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