

Case Study: Acute Sepsis Secondary to Diabetic Foot Ulcer

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Patient Information

Present illness

- Presents to emergency department “not feeling well,” dehydrated, hyperglycemic
- Right heel ulcer extending to bone, no evidence of osteomyelitis, pathogen undetermined
- Admitting diagnosis: Acute sepsis secondary to diabetic right foot infection; hyperglycemia

Past Medical History and comorbid conditions

- Hypertension
- Hypercholesterolemia
- Type II Diabetes Mellitus
- Diabetic Neuropathy
- Chronic Kidney Disease (stage 3)

Diagnostic Tests

Blood Cultures: MRSA (-)
Wound Cultures: MRSA (-)



Laboratory Tests	Patient Results	Normal Range
HgA1C	10.2 (high)	4%-6%
WBC	20.76 (high)	4.23-9.07 10 ³ /m ³
RBC	2.73 (low)	4.00-5.74 10 ³ /m ³
HGB	7.8 (low)	12.6-17.1 g/dL
HCT	24.5 (low)	37.1-50.6 %
BUN	42 (high)	7-22 mg/dL
Creatinine	1.91 (high)	0.67-1.17 mg/dL

Diabetic Foot Care

- Regular inspection and examination by provider
- Daily inspection, including between toes
- Regular foot washing and careful drying (water below 37 degrees Celsius)
- Inspect and palpate inside of shoes
- Avoid barefoot walking and shoes without socks
- Proper footwear
- Cut toenails straight across
- Do not use commercial remedies for callus or corn removal
- Notify provider of blister, cut, scratch, or sore

Medication	Class	Action	Dose/Route /Frequency	Indication	Nursing Process: Assess	Nursing Process: Care	Nursing Process: Teach
Atorvastatin Calcium	HMG CoA reductase inhibitor	Inhibits cholesterol production	10 mg/PO/daily	Hypercholesterolemia	Assess medication history for other drugs that affect liver function	Monitor for signs and symptoms of hepatotoxicity	Teach patient about diet modifications that can lower cholesterol
Carvedilol	Non-selective beta blocker and alpha-1 blocker	Blocks beta receptors, leading to reduced heart rate and force of contraction; blocks alpha-1 receptors, leading to vasodilation	3.125 mg/PO/daily	Chronic hypertension	Assess for history of asthma; assess blood pressure	Monitor for dizziness and lightheadedness for one hour after administration	Teach patient relevance of blood pressure to overall health; teach patient lifestyle modifications that can lower blood pressure
Felodapine	Calcium channel blocker	Blocks calcium binding in the heart, leading to decreased force of contraction	10 mg/PO/daily	Chronic hypertension	Assess blood pressure	Monitor for peripheral edema	Teach patient to sit and stand slowly to avoid orthostatic hypotension
Insulin Glargine	Long-acting insulin; hormone	Lowers blood glucose by allowing cells to absorb glucose from the bloodstream	50 units/SC/daily	Diabetes and hyperglycemia	Assess blood glucose level	Administer insulin using an insulin syringe only	Teach patient that stress can affect blood sugar and alter insulin requirements
Piperacillin Tazo in D5W	Beta-lactam antibiotic (with enzyme)	Inhibits bacterial cell wall synthesis, combined with beta-lactamase inhibitor	3.375 g/IV/q6h	Susceptible bacterial infection	Assess for allergy to penicillin and other related antibiotics, as well as piperacillin allergy	Monitor for signs and symptoms of a super infection	Teach patient and family proper diabetic foot care (see description included below)
Vancomycin	Glycopeptide antibiotic	Inhibits bacterial cell wall synthesis	1750 mg/IV/daily	Bacterial septicemia	Obtain specimens for culture and sensitivity prior to first antibiotic administration	Monitor for extravasation and administer over at least 60 minutes; obtain peak and trough	Teach patient to seek medical attention at the first sign of localized infection

Pathophysiology

- Common diabetic complications include neuropathy and peripheral vascular disease. These often manifest as chronic foot ulcers.
- While infection is diagnosed based on inflammation, this may be less apparent in patients with diabetes, due to ischemia and neuropathy. Additionally, diabetes compromises the immune system, leading to increased susceptibility to infection.
- Sepsis, or “poisoning of body tissues” refers to a state of systemic inflammation and widespread tissue destruction as a result of infection.
- Fever, tachycardia, hypotension, and leukocytosis often accompany sepsis.
- Sepsis can progress to septic shock and death. Early intervention is key.

Implications for the Clinical Nurse Leader

- Assess effectiveness of diabetes education on the unit and seek to improve process, particularly with regards to diabetes management at home
- Improve unit education and protocol surrounding recognition of early signs of sepsis

REFERENCES

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Recognizing Sepsis

Systemic Inflammatory Response Syndrome (SIRS):

- Body temperature > 38°C or < 36°C
- Heart rate > 90 beats per minute
- PaCO₂ < 32 mm Hg
- Respiratory rate > 20 breaths per minute
- WBCs > 12,000, < 4,000, or > 10% immature forms
- Chills, decreased urine output, poor capillary refill, skin mottling, mental status changes

