Pancytopenia and Disseminated Varicella-zoster Virus in a Patient with T-cell Lymphoblastic Lymphoma: A Case Report

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Background

- Though less prevalent with improved vaccination rates, varicella-zoster virus (VZV) can cause significant complications, including superinfection, coagulopathies, immunologic and hematologic alterations, vision-threatening ophthalmic complications, and life-threatening CNS infections.
- Immunocompromised patients have a higher risk of complications from VZV and up to a 36% risk of disseminated disease.
- The skin lesions in immunosuppressed hosts can vary from the typical presentation in that groups of vesicles continue to appear over weeks and the lesions themselves can be larger and hemorrhagic.
- This case discusses a patient with T-cell lymphoblastic lymphoma in maintenance chemotherapy who developed disseminated varicella complicated by pancytopenia.

Objective

Discuss a unique case of varicella-zoster induced pancytopenia in a patient with T-cell lymphoblastic lymphoma.

Patient Case

- The patient is a 26 year old male with medical history significant for T lymphoblastic lymphoma and type 2 diabetes mellitus. He originally presented due to chest pain and was found to have a large anterior mediastinal mass which was biopsied and diagnosed as T lymphoblastic lymphoma. Induction chemotherapy per AAL0434 was completed. Upon initial laboratory evaluation he had a normal complete blood count and a diagnostic lumbar puncture was negative for disease (CNS1). HSV1 and VZV IgG were both positive.
- The patient presented several months after initial diagnosis while on maintenance therapy with methotrexate, 6-mercaptopurine, and vincristine. His chief complaint was new onset of vesicular rash with different stages of evolution on the trunk, limbs, and face. Laboratory results indicated neutropenia, anemia with 4.0% reticulocytes, and thrombocytopenia, as shown in the chart to the right. VZV DNA blood PCR showed 51,900 copies/mL.
- Differential diagnosis for the patient's pancytopenia included myelosuppression secondary to lymphoma progression to the bone marrow as well as viral or chemical myelosuppression.
- The primary diagnosis was disseminated VZV with secondary cellulitis and pancytopenia.

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Patient Case

Images of the patient's skin lesions demonstrating various stages of evolution. A: new lesions prior to crusting over. B: the same lesions after four days of intravenous acyclovir treatment. C: confluence of hemorrhagic crusting lesions led to a superimposed bacterial infection. D: hemorrhagic crusting lesions on leg. E: lesion on lip. F: lesions on upper back. G: lesions on back. H: lesions on plantar foot.

- Bone marrow biopsy suggested viral myelosuppression. Treatment included intravenous acyclovir for VZV, vancomycin for cellulitis, cefepime for neutropenic coverage, and GCSF for myelosuppression.
- After seven days of intravenous acyclovir there were no new or active vesicles, and pancytopenia began to improve. The secondary cellulitis resolved with vancomycin. One additional week of valacyclovir was prescribed outpatient and the patient had eventual resolution of skin lesions.

Laboratory values over time

	During hospitalization	Two week follow-up	Reference range
WBC	1.3	4.8	3.9-10.6 K/mm^3
Absolute neutrophil count	0.81	3.01	1.8-8.0 K/mm^3
Hemoglobin	8.9	12.7	13.0-17.0 gm/dL
Platelets	105	207	150-450 K/mm^3

Discussion

- Not quite a problem of the past
  - VZV is now less common but can confer significant morbidity and mortality if unrecognized, especially in patients with immunocompromise.
- Rash in the immunocompromised patient: a broad differential
  - Differential diagnosis for rash in immunocompromised patients should include viral, bacterial, fungal, and even parasitic infections.
- Recovery of VZV usually results in lifelong immunity, but may not be protective for the immunocompromised patient.
- The skin lesions associated with varicella-zoster virus in immunocompromised individuals may appear more hemorrhagic and lead to increased susceptibility to developing superimposed cellulitis.
- Varicella vaccine programs seem to have led to improved herd immunity to close contacts of immunosuppressed patients and therefore decreased mortality among these individuals.

Before VZV vaccine programs
Immunosuppressed patients accounted for as much as 25% of VZV mortality.

After VZV vaccine programs
Immunosuppressed patients account for less than 20% of varicella related deaths.

Conclusion

Varicella-zoster virus can be a life-threatening diagnosis for which clinicians should remain vigilant. Management of myelosuppression is etiology-dependent; in this case, a bone marrow evaluation was necessary to exclude malignant myelosuppression before GCSF initiation.

References

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