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Cryptococcal Meningitis in an HIV-negative Patient With Underlying Zinc Deficiency Following Partial Gastric Resection

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INTRODUCTION

- ▶ Cryptococcal meningitis in patients without HIV infection is rare and most commonly occurs with a history of glucocorticoid therapy, solid organ transplantation, or hematologic cancer.¹
- ▶ In select cases, a cause of immunodeficiency is difficult to ascertain and thus, cryptococcal disease is unlikely to be suspected.
- ▶ This case presents a patient who was diagnosed with Cryptococcal meningitis secondary to an uncommon and often unrecognized cause of immune system compromise.

CASE PRESENTATION

- ▶ An 88 year-old female with a history of partial gastric resection following a strangulated paraesophageal hernia presented with generalized weakness and intermittent headache for one month.
- ▶ Vital signs were normal with labs revealing hyponatremia. After admission, she became progressively encephalopathic despite appropriate correction of hyponatremia.
- ▶ On hospital day #8, lumbar puncture was performed and cerebrospinal fluid testing revealed the presence of *Cryptococcus neoformans/gattii* leading to a diagnosis of Cryptococcal Meningitis.
- ▶ The patient had no history of HIV, took no immunosuppressive medications and had no documented history of immunodeficiency. Induction therapy with Amphotericin B and Flucytosine was initiated.

- ▶ Chart review revealed a persistent lymphopenia of unknown etiology. Her absolute CD8 and CD4 counts were profoundly low at 8 cells/mm³ and 114 cells/mm³ respectively. Immunology consultation was obtained. It was noted that the patient had normal lymphocyte counts until gastric resection 6 years prior to the current presentation.
- ▶ Following resection, lymphopenia persisted. Tests for vitamin and mineral deficiencies revealed zinc deficiency and replacement commenced with resolution of lymphopenia.
- ▶ The patient had an extended hospital course complicated by severe deconditioning, respiratory failure and hypotension and ultimately succumbed to her illness.

DISCUSSION

- ▶ Cryptococcal meningitis in patients thought to be immunocompetent presents several clinical challenges. Due to lack of clinical suspicion, diagnosis is frequently delayed which contributes to mortality rates of up to 27%, significantly higher than that of HIV patients who are diagnosed.¹
- ▶ Idiopathic CD4 Deficiency is commonly considered in such cases; however, it is a diagnosis of exclusion and other potential causes of immunosuppression must be ruled out.
- ▶ This patient had an underlying lymphopenia following gastric resection; yet, was considered to be immunocompetent. Frequently, micronutrient deficiencies are not recognized as a cause of immunodeficiency.

- ▶ Zinc deficiency causes immune depression and thymic atrophy with a consequent reduction in circulating T-lymphocytes, leaving patients susceptible to opportunistic infections.^{2,3}

CONCLUSION

- ▶ HIV-negative patients with cryptococcal meningitis pose diagnostic and management problems since they commonly have no preceding history suggesting immunosuppression.¹
- ▶ This case highlights the importance of increased awareness amongst clinicians of often unrecognized causes of immunodeficiency such as zinc deficiency and the corresponding risk of opportunistic infection.
- ▶ Specifically, the case demonstrates the importance of close monitoring of immune function in patients with history of gastric resections.
- ▶ A documented history of immunodeficiency in this patient would likely have resulted in inclusion of cryptococcal disease on the initial differential, an earlier diagnosis, and a better clinical outcome.

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