AMC Health Systems and Cancer Research Division

Managing Neurologic, Fluid, and Blood Chemistry Challenges in Cancer Care

Understanding and Responding to Common Cancer-Related Complications

Abstract

Cancer and its treatments often lead to a range of physiological complications that go beyond tumor control. These include neurologic issues such as peripheral neuropathy and cognitive dysfunction, fluid imbalances such as ascites and pleural effusions, and disturbances in blood chemistry including electrolyte imbalance and treatment-induced diabetes. This report offers a comprehensive overview of these complications, drawing on patient experiences, clinical best practices, and up-to-date guidance from global cancer institutions. The goal is to equip patients and caregivers with practical knowledge and management strategies to enhance quality of life and functional recovery.

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2. Introduction

While the primary focus in cancer care is often tumor eradication, equally important is the management of secondary complications. Neurologic side effects, fluid retention, and disruptions in blood chemistry can all significantly impair a patient's well-being. These complications may be transient or chronic, and may stem directly from cancer or its treatment. This report synthesizes clinical guidance and lived experience to better understand and manage these multifaceted challenges.

3. Main content

a) Neurologic Problems

Peripheral neuropathy, characterized by numbness, tingling, or pain in the hands and feet, is commonly associated with certain chemotherapy drugs like paclitaxel, cisplatin, and vincristine. Patients may struggle with basic functions like buttoning a shirt or walking steadily. Management strategies include reducing or stopping the offending medication, prescribing drugs like gabapentin or amitriptyline, and physical therapy. Safety tips—such as using gloves when handling cold objects or using handrails—help prevent injury. Cognitive dysfunction, colloquially called "chemo brain," affects memory and concentration. This can result from chemotherapy, cerebral edema, electrolyte imbalances, or emotional distress. Pharmacological treatments like donepezil and non-drug therapies such as cognitive rehabilitation and regular mental activity can assist in recovery.

Cerebral edema, or brain swelling, presents with symptoms such as headache, nausea, visual disturbances, or confusion. Common in patients with brain metastases or post-radiation, it is typically treated with corticosteroids like dexamethasone and may require hospitalization in severe cases. Seizures caused by cerebral edema are managed with antiseizure medications such as phenytoin.

b) Fluid Retention and Lymphedema

Swelling in the legs or abdomen can result from protein imbalance, cancer-related obstruction, or thrombosis. Ascites, fluid buildup in the abdominal cavity, causes bloating and discomfort. Treatment includes dietary changes, paracentesis, or the use

of peritoneal shunts. Pleural effusion, or fluid in the lung cavity, causes breathlessness and can be relieved by thoracentesis or pleurodesis.

Lymphedema, often following lymph node removal or radiation, causes persistent swelling, commonly in arms or legs. Symptoms include tightness, discomfort, and skin changes. Management includes physical therapy, use of compression garments, elevation, massage, and referral to a lymphedema specialist.

Deep vein thrombosis (DVT) is a critical risk in cancer patients, often indicated by unilateral leg swelling and pain. It is confirmed via Doppler ultrasound and treated with anticoagulants like heparin and warfarin. Long-term treatment requires frequent INR monitoring. In recurrent cases, an IVC filter may be inserted to prevent pulmonary embolism.

c) Blood Chemistry and Diabetes

Blood chemistry disruptions include abnormal liver or kidney function, electrolyte imbalances, or hyperglycemia. Cancer therapies often demand vigilant monitoring to prevent severe complications. Hydration, electrolyte replacement, and dose adjustments are common interventions.

Steroid-induced hyperglycemia can lead to persistent diabetes in some patients. Symptoms include frequent urination, fatigue, and blurry vision. Diagnosis is confirmed via fasting blood glucose tests, and treatment may involve lifestyle changes, oral medications, or insulin injections. Patients at risk should be monitored closely and referred to endocrinologists when needed.

Paraneoplastic syndromes are rare but significant, often presenting before a cancer diagnosis. They result from hormone-like substances secreted by tumors and may lead to high calcium, low sodium, or joint pain. Management focuses on treating the underlying cancer and alleviating symptoms with medications.

4. Conclusion

Neurologic, fluid-related, and blood chemistry complications are complex but manageable aspects of cancer care. Early identification, appropriate medical interventions, and supportive therapies play a pivotal role in mitigating their impact. Patient education, multidisciplinary care, and personalized follow-up are key to ensuring better outcomes and enhanced quality of life.

7. Recommendations

- Implement regular screenings for neuropathy and cognitive function.
- Ensure patients are educated about fluid retention signs and home management strategies.
- Use interdisciplinary approaches including physiotherapists and dietitians for managing lymphedema and ascites.
- Monitor blood chemistries regularly during and after chemotherapy.
- Screen high-risk patients for treatment-induced diabetes and provide early intervention.

7. References

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