Chemotherapy Complications

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KEYWORDS

• Myelosuppression • Neurotoxicity • Nephrotoxicity • Cardiotoxicity
• Chemotherapy adverse effects • Side effects management

HOSPITAL MEDICINE CLINICS CHECKLIST

1. The role of pharmacogenetics in determining drug efficacy and toxicity, according to the patient's genetic profile, has become important in the selection of chemotherapy agents.
2. Commonly used medications, such as antacids, nonsteroidal antiinflammatory agents, and antibiotics, can cause serious interactions with chemotherapy agents.
3. Consider other causes in the differential diagnosis of patients with uncontrolled nausea and vomiting, such as central nervous system (CNS) involvement, intestinal obstruction, and gastroparesis.
4. Monitor closely patients with chemotherapy-induced neutropenia for any signs of infection.
5. The main modality of treatment of chemotherapy-induced anemia is blood transfusions. Erythropoietin-stimulating agents are not usually indicated and may be associated with increased mortality.
6. Cardiovascular toxicity and its association with chemotherapy agents can be acute or delayed.
7. Chemotherapy-induced neurotoxicity may involve the CNS as well as the peripheral nervous system.
8. Always take into consideration the cognitive problems caused by chemotherapy.
9. Establishing a multidisciplinary team approach, as well as an excellent communication system between hospitalists, oncologists, and specialists, is paramount in the management of hospitalized patients with cancer.

Disclosure: The author has nothing to disclose.
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Hosp Med Clin 5 (2016) 400–412
http://dx.doi.org/10.1016/j.ehmc.2016.02.001
2211-5943/16/$ – see front matter

DEFINITIONS

Why is the knowledge of chemotherapy side effects important for hospitalists?

In recent years there has been significant progress in the development of new medical therapeutic agents for the treatment of cancer. This progress has translated into increased survival and improved outcomes. A clear understanding of the benefits and side effects, as well as the potential interaction among different agents, is crucial in the management of this patient population. This article guides hospitalists in the management of the adverse reactions and side effects most commonly encountered in patients undergoing chemotherapy. There are several modalities of medical therapy available. Different factors need to be taken into account in the selection of the treatment regimen. Initial evaluation needs to include disease stage (early vs advanced), patient performance status, comorbid conditions, patient's preference, age, and menopausal status for patients with a breast cancer diagnosis. Medical treatment of most cancers might include 1 or more of the following modalities: chemotherapy, hormonal therapy, targeted therapy, immunotherapy, and bone-modifying agents.

What is the role of pharmacogenetics in the management of patients with cancer?

Most recently, the role of pharmacogenetics has been shown to be crucial in the selection or avoidance of a particular chemotherapy agent, according to each patient's genetic profile. Its importance is that it helps to determine the variation of a phenotypic expression of a particular gene structure, as it relates to toxic or therapeutic responses to different drugs[1] (**Table 1**).

DRUG INTERACTIONS AND TOXICITY

Why are drug interactions of special importance in the management of patients with cancer?

More than 20% of all adverse reactions are caused by drug interactions,[1] which is of particular importance in patients with cancer, because most of the agents are inherently toxic and have a low therapeutic index. Furthermore, small pharmacodynamic or pharmacokinetic changes can significantly affect their efficacy and increase their toxicity. **Table 2** lists common interactions related to chemotherapy agents.

Table 1
Clinical manifestation and phenotypic expression of cancer drugs

Drug	Gene	Process	Clinical Manifestation	Phenotype
Irinotecan	UGT1A1	Glucuronidation	Fatal neutropenia	Not apparent phenotype. Detection abnormal bilirubin levels
Tamoxifen	BCAR4	CYP2D6	Decreased effectiveness and increased mortality	2D6 poor metabolizer phenotype
5FU	DPYD	Degradation of pyrimidine bases	Increased toxicity	—

Abbreviations: 5FU, 5-fluorouracil; CYP2D6, cytochrome P 450 2D6.