FEATURE ARTICLE

Why There Is No Cookbook Approach to Palliative Care: Implications of the P450 Enzyme System

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A plethora of literature describes the impact of the P450 enzyme system, but this information is limited regarding its relevancy to nursing practice. However, oncology nurses providing palliative symptom management must have a working knowledge of the P450 enzyme system to recognize the variability that exists among individual medication reactions or why a "cookbook approach" to symptom management is not always effective and appropriate. This article describes the variations associated with medication metabolism with reference to ethnic differences. Having a basic understanding of the P450 enzyme system and, more specifically, the CYP2D6 influence on the metabolism of common medications used in palliative symptom management can help to prevent medication toxicity or underdosing, which interferes with patients' quality of life.

Key Words: cytochrome P-450 enzyme system, pharmacokinetics, palliative care

Integrating palliative interventions throughout the clinical course of patients' cancer treatment experience promotes quality of life. As defined and updated by the World Health Organization (2002), "palliative care . . . provides relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychological and spiritual" (p. 10). Palliative care interventions should be considered throughout patients' disease trajectory and not reserved for the imminently dying or performed within a time-defined framework, such as at the end of life (Davis, Walsh, LeGrand, & Lagman, 2003; Last Acts, 2002; Sepulveda, Marlin, Yoshida, & Ullrich, 2002).

Participating in the management of common symptoms (e.g., pain, dyspnea, fatigue, depression) requires skilled nursing assessment and the use of knowledgeable interventions, such as medication administration, through a coordinated and continuous pattern initiated throughout the cancer experience from the time of diagnosis until death (Kuebler & Esper, 2002). Nurses advocating for patients and their families must recognize the many variables that affect the use of common symptom management medications.

Failure to recognize the importance of interindividual drug metabolism, interactions, and the variability in response to common medications used to provide palliative interventions can lead to overdosing or the undertreatment of symptoms that interfere with patients' perceived quality of life (Bernard & Bruera, 2000; Davis & Homsi, 2001). This article is intended to provide oncology nurses with a basic understanding of the importance of drug interactions and the relevance of the P450 enzyme system as it relates to symptom management. The interindividual variations related to metabolism, ethnicity, and biologic modifiers determine patients' response to specific medications and therefore challenges the use of algorithms, pathways, and standardized approaches to symptom management (e.g., equianalgesic tables) (Anderson, Saiers, Abram, & Schlicht, 2001; Davis, 2003; Davis & Homsi).

Drug Interactions

Patients with advanced cancer receive an average of five or more medications at any given time for symptom relief. Polypharmacy increases the risk of adverse drug interactions (Davis & Homsi, 2001). Drug interactions generally fall into two categories: pharmacodynamic or pharmacokinetic.

Pharmacodynamic interactions are related to a drug's mechanism of action on physiologic function. Drug interactions of this type frequently involve competition at a specific receptor site or neuronal pathway. Drug metabolism may remain unaltered. For example, a common pharmacodynamic drug-to-drug interaction may involve the concomitant use of an antimuscarinic drug (anticholinergic) and a prokinetic drug (antacid). When these drugs are prescribed together, the final pathway for the prokinetic drug (e.g., metoclopramide) is cholinergic. A drug with anticholinergic properties (e.g., diphenhydramine) may block the same receptors or pathway of metoclopramide; ultimately, this competition will diminish the

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