Pharmacology Matters

WHY PHARMACOLOGY MATTERS

Pharmacology Matters

Gastroenterology nursing, like other nursing specialties, encompasses all aspects of nursing care, with a focus on patient comfort and safety. During gastroenterological procedures, patient comfort is often achieved with the use of sedative and analgesic drugs. The use of these drugs requires an understanding of not only indications and dosages but also drug absorption, distribution, metabolism, and excretion. In addition, knowledge of drug effects and appropriate interventions for unwanted side effects is necessary for safe administration.

With the desire to have a resource that is pertinent, informative, and clinically applicable, we introduce this new, regularly occurring column, “Pharmacology Matters,” in Gastroenterology Nursing. Various topics related to drugs commonly administered in gastroenterology units will be explored. References and recommended reading will be cited to guide further review. This introductory column is a review of basic pharmacology that will serve as the foundation for future columns.

A Review of Basic Pharmacology

Pharmacology is defined as the study of drugs. The acronym “ADME” is often used to organize the basic understanding of drugs (Table 1). “A” represents absorption. “D” represents distribution, how the drug disperses in the body. “M” represents metabolism, and “E” represents elimination. In addition, “ADME” can also be used to represent administration, dosage, mechanism of action, and effect for further clinical application.

Administration

Administration of drugs is often achieved by topical, enteral, and parenteral routes. These usual administration routes achieve peak blood levels in order from fastest to slowest, intravascular, rectal, intramuscular, oral, and topical. Intravascular administration produces an immediate blood drug concentration and therefore is associated with pronounced effects. In the case of sedative and analgesic agents, respiration and consciousness can quickly be suppressed.

Dosage

Dosage of drugs is often quantified in milligrams or micrograms per kilogram of body weight. It is important to calculate the amount of drug to be administered on the basis of recommended dosages, as opposed to delivering a drug as a given milliliter amount. Modification of the per kilogram dosages should be considered on the basis of patient age, coexisting diseases, and weight. Lean body weight (total bodyweight weight minus adipose tissue), as opposed to total body weight, is often the prudent choice to base sedative/analgesic dosages.
Mechanism of Action and Interactions

Drugs often exert their effect by activating or blocking particular receptors in the body. Receptors are protein channels imbedded in lipid cell membranes, and these receptors direct, or influence, action inside and outside the cell. Knowledge of a drug’s site of action, particularly its receptor site, will help with the understanding of the drug’s effects.

Effects and Side Effects

A drug’s effect is related to its concentration, site, type of action, and the physiological condition of the patient. A sick, elderly, or weakened patient can be expected to have a greater response to a depressant drug than a younger, healthier patient. An effect is usually the desired result of the drug, whereas a side effect is an undesirable result (i.e., the effect of midazolam is sedation; its side effect is respiratory depression).

The basic foundation of “ADME” directs the minimal required knowledge for any drug that is administered to a patient. A drug handbook should be readily available for reference. Each drug’s “ADME” should be known and adjustment of the dosage made on the basis of patient assessment.

RECOMMENDED READINGS
