

Herbal Medicines and the Surgical Patient

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An area of current therapeutics that is growing in enthusiasm among the American general public is medicinal herbs, which may include any botanical or plant-derived product used for health purposes. Although more physicians are beginning to recognize the historical value and relative safety of herbs in popular use, many clinical concerns remain unaddressed or unanswered. In contrast to standard drug therapy, herbal medicines are classified as “dietary supplements” under the Dietary Supplement and Health Education Act of 1994, and are therefore excluded from the pre-marketing safety and efficacy testing routinely required for conventional pharmaceuticals by the Food and Drug Administration in the United States. Despite this lack of scrutiny of “natural” (perceived by many as “wholesome”) remedies, the field is burgeoning with public enthusiasm and supported by a rapidly expanding commercial industry. This has become more prominent as patients seek more autonomy in disease prevention and in the management of their personal well being. A landmark survey suggested an almost 4-fold increase in the use of herbal preparations over the past decade, with nearly 1 in 5 individuals interviewed taking herbs or dietary supplements in addition to their conventional prescription medications^[1]. Multiple studies project future expenditures of \$4 or \$5 billion per year in the United States on various herbal supplements. Mindful of these statistics, an estimated 15 million adults in this country are potentially at risk for adverse drug/herbal medication interactions¹.

An important group of individuals using herbal medications comprises those undergoing surgery. Several studies have emphasized the higher than average usage of herbs in this patient population^{2,3,4}. Primary care physicians and anesthesiologists are often not informed of such usage, and the majority of these patients continue to use herbal products until the day of surgery⁵. A variety of reasons for lack of disclosure have been postulated, including fear of censure by physicians, public perception that administering such products is beyond the scope of knowledge of most physicians and pharmacists, and the assumption that herbal medicine use is harmless^{2,5}.

The true prevalence of drug and herbal interactions during anesthesia and surgery is unknown, although

several recent reviews have summarized existing published data^{6,7,8}. It has been proposed that herbal medicines may impact anesthesia and conventional pharmaceuticals in a variety of ways. Potential mechanisms for adverse effects are the intrinsic pharmacologic effects of herbs, which may mimic or antagonize drug effects, alter the action of conventional drugs at effector sites, and alter the absorption, distribution, metabolism and elimination of conventional drugs². The paucity of reports of adverse effects likely reflects the relatively benign nature of most herbs, and the general problems inherent in studying herbs. Some of these problems include: inaccurate product labeling, which may be incomplete or misidentify components, the wide-ranging variability of the content and concentration of similarly labeled products, adulteration of products with other bioactive ingredients, heavy metals or other contaminants, and the natural variability of potency of strains of the same plant product. In addition, many herbal medicines achieve their specific therapeutic effects only in combination with multiple herbs. Despite these limitations, a reasonable, albeit rapidly evolving, approach to the evaluation of presurgical risk and recommendations for avoidance of herbal/drug interactions in surgery can be extracted from the literature and applied to some commonly used herbal medications^{2,4,6,7,8,9}.

Echinacea is a member of the daisy family, and commonly used as an immunostimulant for the short-term treatment of upper respiratory and urinary tract infections. All species of Echinacea increase macrophage activity, as well as the levels of certain immune modulating chemicals. A theoretical concern with the use of this product in patients awaiting organ transplantation has been raised. Long-term use greater than 8 weeks is not recommended, and has been associated with paradoxical immunosuppression and a theoretical risk of postsurgical infectious complications.

Ephedra, also known as *ma huang*, is used to promote weight loss, increase energy, and to treat upper respiratory conditions. It causes a dose-dependent increase in both heart rate and blood pressure. Ephedrine, which is the active component, has been associated with numerous adverse events including fatal cardiac and CNS events. Ephedra taken prior to halothane anesthesia may pose a risk, as halothane sensitizes the myocardium to ventricular arrhythmias caused by exogenous catecholamines. Long-term use may result in depletion of endogenous catecholamine stores and perioperative hemodynamic instability.

Feverfew is a daisylike perennial with mild anti-inflammatory properties. It is commonly used for migraine prophylaxis and for the treatment of arthritis. It has been shown to inhibit platelet activity and to induce vasodilation. Abrupt discontinuation has been associated with rebound headache and agitation.

Garlic has been well studied for its beneficial effects as a lipid lowering agent and as a possible mild antihypertensive. Several constituents of garlic, especially allicin and its transformation products, exert prolonged antiplatelet effects that may have clinical relevance in the surgical patient. Isolated reports describe perioperative cases of abnormal bleeding possibly linked to garlic ingestion.

Ginger has been used as an antiemetic and antispasmodic in small doses preoperatively, with relative safety and little anticoagulant effect. However, large doses or chronic use may inhibit platelet aggregation via inhibition of thromboxane A2 synthesis.

Ginkgo, which has been used in traditional Chinese medicine for thousands of years, has gained recent attention for its usefulness in treating cognitive disorders, especially Alzheimer's and multi-infarct dementia. It has also been used for its ability to increase fluidity of blood and promote peripheral perfusion, in the treatment of peripheral vascular disorders. Ginkgo inhibits platelet-activating factor, which raises concerns about its use with anticoagulants. It may increase perioperative bleeding, especially in the elderly patient.

Ginseng is one of the most popular and expensive herbs in the world. It is considered a tonic to promote vitality, athletic and sexual performance, as well as possibly attenuate the effects of stress and aging. It is composed of a heterogeneous group of pharmacologically active ginsenosides, with a broad therapeutic effect that is incompletely understood. While its safety profile appears to be favorable, it may interfere irreversibly with inhibition of platelet aggregation and enhance fibrinolysis. Ginseng can affect the cardiovascular system, causing either increases or decreases in heart rate and blood pressure depending on the individual's unique response. It may also interfere with or increase the effects of warfarin, stimulants, hypoglycemic agents, and monoamine oxidase inhibitors.

Kava, which has been used in the South Pacific as a recreational drink, is primarily used here as a sedative and anxiolytic. It is presumed to act by

potentiating GABA inhibitory neurotransmission, and thereby has a central muscle-relaxing property and anticonvulsant properties. It may adversely increase the effects of barbiturates and benzodiazepines. Additionally it may be habit forming with long-term use.

St. John's wort is used as an herbal treatment for mild depression. Its main active components include hypericin and hyperforin, which selectively inhibit serotonin, dopamine, and norepinephrine in the CNS. Problems may arise when it is used with other medications, through activation of the hepatic cytochrome P450 system. Decreased plasma levels of a large range of drugs, including anticoagulants, oral contraceptives, and antiviral agents have been described. There is also a concern that serotonin overload can occur when it is combined with SSRI's, especially in the elderly.

A large number of plants contain **salicylate** and should be used cautiously in the pre-operative patient. These include: black cohosh, chamomile, meadowsweet flower, wintergreen leaves, poplar bark, sweet birch bark, and white willow bark. **Coumarin**-containing plants carry the theoretical risk of interfering with warfarin anti-coagulation and include: horse chestnut bark, sweet clover plant, sweet vernal grass leaves, sweet-scented bedstraw plant, tonka bean seeds, vanilla leaf leaves, and woodruff plant¹⁰.

In summary, it is recommended that the preoperative history include detailed and specific questions regarding herbal medicine usage. Guidelines released by the American Society of Anesthesiologists suggest that patients discontinue all herbal medications 2 weeks before surgery. This may be impractical or impossible before emergent surgery, or abrupt discontinuation may cause adverse rebound CNS effects with certain herbal products. It is therefore imperative that physicians attending surgical patients have a familiarity with the basics of common herbal usage, and an awareness of the potential complications that may be associated with herbal medicines in the perioperative period. Whenever possible, certain herbs that affect bleeding, coagulation, and hemodynamic parameters should be discontinued 1 to 2 weeks prior to surgery.

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