

Drug Interactions and Medication Teaching in Concurrent use of Herbal Medicines and Pharmaceutical Drugs

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Herbal medicines have been used worldwide, particularly in East Asia, for thousands of years. These herbs mainly originate from plants, minerals and animal products, and may be used either in their primary forms or combined into mixture. Herbal preparations can also be formulated into pills, liquids, extract powder and tablets, as well as being commercially available in the form of proprietary medicines. Conceptually, herbs are usually considered to be non-toxic by the general public due to their natural origin. However, the consumption of herbs is well-known to be capable of producing prominent adverse health effects. Due to increase morbidity and mortality, poisonings associated with the use of herbs have raised universal attention in the last few years.

Most of the modern medicines are allopathic and cannot cure chronic diseases such as hypertension, diabetes, or allergic disease. Owing to the ineffectiveness of modern medicine against chronic diseases as well as the possibility of side effects, many patients choose to explore complementary and alternative medicines, and medicinal herbs in particular.

Lately, herbal medicine has received increasing attention as an alternative source of treatment for chronic diseases and terminally disease such as cancer and AIDS, etc. However, the main stream of medical treatment for chronic diseases is based on pharmaceutical medicine in general. Since herbal medicine and pharmaceutical drug gave their own characteristics, it is ideal that these medicines should be combined, making up for defects of each other and expecting their synergistic action. Although toxicity and therapeutic failure have long been recognized as possible consequences of the interactions among pharmaceutical drugs.

It is not uncommon for one patient to seek care from several doctors for an ailment. As a result, a patient may easily be taking multiple drugs, herb and vitamins concurrently. It becomes very difficult to predict whether the combination of all these medications will lead to unwanted side-effects and/or interaction. Interaction between herbal medicines and pharmaceutical drug can compromise therapy. Drug interactions between herbal medicines and pharmaceutical drugs through concurrent use of them may increase or decrease the pharmacological and toxicological

effects of either component. Especially, the possible adverse effects that may arise from drug interactions between herbal medicines and pharmaceutical drugs are equally worrying.

The nature of herb-drug interactions is not a chemical interaction between a pharmaceutical drug and an herb component to produce something toxic. Instead, the interaction may involve having an herb component cause either an increase or decrease in the amount of drug in the blood stream. A decrease in the amount of drug could occur by herb components binding up the drug and preventing it from getting into the blood stream from the gastrointestinal tract, or by stimulating the production and activity of enzymes that degrade the drug and prepare it for elimination from the body. An increase in the drug dosage could occur when an herb component aids absorption of the drug, or inhibits the enzymes that break down the drug and prepare it for elimination. A decrease in drug dosage by virtue of an interaction could make the drug ineffective; an increase in drug dosage could make it reach levels that produce side effects. Alternatively, an herb might produce an effect that is contrary to the effect desired for the drug, thereby reducing the drug effect; or, an herb might produce the same kind of effect as the drug and give an increase in the drug effect.

With worldwide expansion of the usage of herbal medicines, the problems of drug-herb interaction become popular in clinical pharmacology. Many report about herb-drug interaction mentioning the inhibition or the promotion of metabolic enzymes have been published. For example, grape fruit juice and St. John's wort have been reported to strongly inhibit and promote the activity of CYP3A4, respectively.

However, some of the possible interactions were merely favorable ones, such as eleuthero(*Eleutherococcus senticosus*) increasing the efficacy of antibiotics(the mycin drugs) in the treatment of colitis. Herbs can have significant positive effect when used as part of a program of drug therapy, such as reducing the side effects, but the concerns being raised by doctors and patients are for the potential adverse response.

Information for practitioners and pharmacists to relay to patients about type of interactions with pharmaceutical drugs is as follows ; (1) drug absorption inhibited by binding, resulting in low drug levels, (2) drug absorption inhibited by rapid transit time, resulting in low drug levels, (3) drug absorption and/or elimination modified, (4) drugs metabolized too slowly resulting in elevated drug levels, (5) potassium decreased when using cardiac drugs, resulting in adverse cardiac conditions, (6) drug action is intensified by similar effect of herbs, (7) drugs cause adverse reaction to occur when certain substances are ingested, (8) desired drug effect is counteracted by herb effect.

Such response can occur with drug-drug interaction and with food-drug interaction, so the finding of some instances of herb-drug interaction would not be supprsing.

Plausible cases of herbal medicine-pharmaceutical drug interactions include : bleeding when warfarin is combined with Dansam(*Salvia miltiorrhiza*), ginkgo(*Ginkgo biloba*), garlic(*Allium sativum*), or Danggui(*Angelica sinensis*); mild serotonin syndrome in patients who mix St John's

wort(*Hypericum perforatum*) with serotonin-reuptake inhibitors; potentiation of oral and topical corticosteroids by liquorice(*Glycyrrhiza glabra*); decreased blood concentrations of prednisolone when taken with the herbal preparation(Shoshiho-Tang); and increased blood concentrations of cyclosporine and calcium antagonists felodipine when taken with the grapefruit juice.

The intestinal bacteria, *Eubacterium sp.* and *Bifidobacterium sp.*, participate in the metabolism of active herbal medicine ingredients, glycyrrhizin(GL), sennoside(SEN) and baicalin(BL), etc. Since antibiotics and bacterial preparations, *Bifidobacterium longum*, *Closteridium bytyricum*, and *Streptococcus faecalis*, affect the bacterial population in intestinal bacterial flora, metabolism of the active herbal medicines in the bacterial flora may be altered by their combined administration. Antibiotics may lower the metabolism of GL, SEN and BL when administered in combination. On the other hand, it is also highly possible that bacterial preparations increase the number of *Eubacterium sp.* and *Bifidobacterium sp.*, resulting in enhanced metabolism of GL and SEN when they are used concomitantly with herbal medicines.

Patients that are taking multiple drug therapies are at greater risk of interactions between each of the drugs, between drugs and foods, and between drugs and herbs. Therefore, greater caution must be exercised in considering use of herbs for these patients and, especially, herbs that may have a similar therapeutic action. In order to more skillfully combine drug and herb therapies, it behooves the practitioners and pharmacists to learn as much as possible about the mechanisms of action of both the drugs and the herbs.

Recognition of the potential for drug and herbal products to interact with each other provides practitioners and pharmacists with the opportunity to help patients make better and more educated decisions about using natural products with their prescription drugs. By staying informed, pharmacists can share information about new drug interactions with patients. Additionally, pharmacists need to monitor professional materials to learn about drugs-herbs interactions. Not only can pharmacists educate their patients on avoiding adverse effects but they can also dispel myths about drug interactions.

A lot of work is still waiting to be done in a systematic search for the interactions between herbal medicines and pharmaceutical drugs. Hence, when practicing the concomitant use herbal and pharmaceutical drugs, one should watch out for the reactions of patients to the drugs and integrate this information to the overall planning in the therapy. While trying to maximize treatment efficiency by including alternative medicine, it is of utmost importance that patient safety should come before all else.