

DRUG -HERB INTERACTIONS

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ABSTRACT

Herbs have been used for medicinal purposes since long. Majority of our people have a feeling that herbs are harmless plants although many of our drugs (including digitalis, morphine, atropine, and several chemotherapeutic agents) were developed from plants. Hence, herbs can be potent products. The last few years has seen the emergence of several types of alternative medicine providers (such as Naturopaths) joining the doctors prescribing allopathic medicine. In almost all countries the herbal and other dietary supplements do not have to meet the same standards as of allopathic drugs. There is no pharmacopoeia for these herbal preparations either. Under such situations safety becomes a big concern due to unpredictable drug-herb interactions. A number of people use herbal products for preventive and therapeutic purposes but they do not tell their doctors they are taking herbal remedies and this can create confusion if drug-herb interactions develop.

Keywords: Drug interactions, herbal medicines, allopathy naturopaths.

INTRODUCTION

When two or more drugs are given to a patient simultaneously a drug interaction occurs. The effects of the drugs may increase, decrease or a new effect may be produced that neither produces on its own. When we mention about an interaction it is always drug-drug interactions that come to our mind. However, interactions may also exist between drugs and foods (drug-food interactions), as well as drugs and herbs (drug-herb interactions).

Drug interactions result on account of various processes. These processes may include alterations in the pharmacokinetics of the drug, such as alterations in the absorption, distribution, metabolism and excretion of a drug. Alternatively, drug interactions may be the result of the pharmacodynamic properties of the drug e.g. the co-administration of a receptor antagonist and an agonist for the same receptors. As drug-drug and drug-food interactions, drug- herb interactions are also very common. Herbal medicines can inhibit, exaggerate or cancel the actions of a prescription drug.

As herbs can affect body functions drug interactions are possible when herbs are taken concurrently with drugs.¹ If an interaction between a drug and an herb does occur, conventional drugs are usually thought to be responsible because they are more pharmacologically active. Unlike conventional drugs, herbal products are not regulated for purity and potency. Thus, some of the adverse effects and drug interactions reported for herbal products could be caused by impurities (e.g., allergens, pollen and spores) or batch-to-batch variability. In addition, the potency of herbal product may increase the possibility of adverse effects. Physicians must be alert for adverse effects and drug interactions associated with herbal remedies, and they should ask all patients about the use of these products².

As physicians are likely to encounter patients who are using herbal remedies, they should be aware of drug herb interactions.

The following are the examples of known interactions between popular herbs and prescriptions.

Echinacea

It is most often used to enhance immune function in individuals who have cold and other respiratory tract infections. As it can enhance the immune system it should not be used with drugs that affect the immune system like the immunosuppressants (cyclosporine) and corticosteroids (prednisolone). Immunosuppressants are used in the treatment of cancers or after organ transplant. Until its role in immune modulation is better defined it should be avoided in patients with immune deficiency disorders (AIDS, cancer), autoimmune disorders (multiple sclerosis, rheumatoid arthritis) and patients with tuberculosis. Some preparations have high alcohol content and should not be used with medications like metronidazole known to cause disulphiram like reactions³.

Ephedra

Ephedrine and related alkaloids are the pharmacologically active moieties of the extract of Ephedra (a genus of shrubs). Large amounts of herbal preparations (ephedra, ma huang) are utilized round the world. It is commonly found in herbal weight-loss products referred to as "herbal fen-phen."

Ephedrine-containing products are also marketed as decongestants, bronchodilators and stimulants. Other promoted uses include enhancement of athletic performance and body-building efforts. The risks of using ephedrine-containing supplements appear to outweigh the benefits. Consequently, patients should be advised not to use these products if they are sensitive to the effects of sympathomimetic agents. Such patients include those with hypertension, hyperthyroidism, diabetes mellitus, psychiatric conditions, glaucoma, prostate enlargement, seizure disorders and cardiovascular diseases. Concomitant use of ephedrine-containing products and caffeine or other stimulants should also be discouraged.

Ephedrine should be avoided with antihypertensive drugs like beta blockers - metoprolol, propranolol, alpha blockers - prazosin, antidepressants - amitriptyline, desipramine, diuretics - furosemide,

thiazides, inotropic drugs - digoxin, anticholinergic drugs - atropine, bronchodilators - theophylline and certain anaesthetics like cyclopropane, halothane.

Ginseng

It has anti-platelet properties and should not be used in combination with warfarin. Cytokine stimulation has also been observed with ginseng necessitating cautious use in individuals who are immunocompromised, are taking immunostimulants or suppressants or have autoimmune disorders³. Irritability, sleeplessness and manic behavior has been reported in psychiatric patients using ginseng in combination with other medications (phenelzine, lithium, neuroleptics). Ginseng should be used cautiously in patients taking any psychiatric, estrogenic or hypoglycemic medications. Long term use of ginseng may cause menstrual abnormalities and breast tenderness in some women. Ginseng is not recommended for pregnant or lactating women.

Ginseng may cause adverse reactions with amlodipine. It may interfere with the pharmacodynamic actions or monitoring of digoxin. [4] It may also inhibit the analgesic actions of opioids⁵.

Ginkgo

It may have anti-platelet properties and should not be used in combination with anti-platelet or anticoagulant medications. Ginkgo seeds are epileptogenic and seizures have been reported. Hence, ginkgo formulations should be avoided in individuals with pre-existing seizure disorders³. It should not be given along with selective serotonin reuptake inhibitors like fluoxetine, paroxetine as it may cause serotonin syndrome comprising of symptoms like tachycardia, restlessness and sweatings.

Garlic

As it has anti-platelet effects patients using anti-clotting mechanisms like warfarin, aspirin, ibuprofen should use garlic cautiously. Additional monitoring of signs and symptoms of bleeding is warranted. It may reduce the bioavailability of

saquinavir, an antiviral protease inhibitor but it does not appear to affect the bioavailability of ritonavir³. If combined with anti-diabetic medication it can cause a dangerous decrease in blood sugars. Some people who are sensitive to garlic may experience heartburn and flatulence.

Feverfew

It is believed to be the natural remedy for migraine. It should never be taken along with migraine medications as it can result in tachycardia and severe hypertension. It should also be used cautiously with anti-platelet and non-steroidal anti-inflammatory drugs.

Kava

It is an herb that has anti-anxiety, pain relieving, muscle relaxing and anticonvulsant effects. It is better avoided with other central nervous system (CNS) depressing drugs like alcohol, barbiturates, anti depressants, and antipsychotic drugs. It is reported that it may reduce the effectiveness of levodopa, a drug used in the treatment of parkinsonism. Hence, it should not be used during levodopa therapy of parkinsonism.

St. John's Wort

It is a popular herb used for the treatment of mild depression. The active ingredient of St. John's Wort is hypericin which is the primary antidepressant constituent. Inhibition of reuptake of various amine transmitters is the potential mechanism of action of St. John's Wort. Drugs with similar mechanism of action like antidepressants should be used cautiously or avoided in patients using St. John's Wort due to the risk of serotonin syndrome or monoamine oxidase (MAO) crisis. The herb may induce hepatic CYP enzymes 3A4, 2C9, 1A2 and P-glycoprotein drug transporters. This has led to case reports of sub therapeutic levels of numerous drugs, including digoxin, oral contraceptive pills, cyclosporine, HIV protease and non nucleoside reverse transcriptase inhibitors, warfarin, theophylline and anti-convulsants³. It causes photo-toxicity when used with tetracyclines, sulphonamides and proton pump inhibitors⁶.

White Willow

It is an herb traditionally used for fever, headache, pain, and rheumatic complaints. It can cause gastrointestinal irritation and stomach ulcers. It displays similar reactions as aspirin (aspirin is derived from white willow). It should not be used with carbonic anhydrase inhibitors. These drugs are used in the treatment of glaucoma, epilepsy and altitude sickness. White willow contains salicylates, hence it should not be combined with cyclo-oxygenase (COX) II inhibitors as there may be an increased risk of gastric bleeding and stomach ulcers. Metoclopramide being a prokinetic drug has to be avoided with white willow as its absorption is increased when given concurrently. Anticoagulants should not be combined with white willow as there can be an increased risk of bleeding. It should also not be combined with methotrexate, a drug used in the treatment of cancers.

Aloe Vera

The latex of aloe vera has laxative properties and lowers blood sugar. Hence, concurrent use of laxatives and hypoglycemic agents should be avoided. It also decreases the intestinal absorption of vitamin K and may precipitate anticoagulant effects of warfarin. [6] As it can decrease potassium levels it should not be used with digoxin and diuretics as hypokalemia can cause potentially dangerous arrhythmias with these drugs.

CONCLUSION

Controlled clinical studies are needed to clarify and determine the clinical importance of drug herb interactions. Patients taking drugs with a narrow therapeutic index should be discouraged from using herbal products. More research is required to define the interactions.

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