

**REVIEW ARTICLE****DRUG INTERACTIONS WITH COMPLEMENTARY AND ALTERNATIVE MEDICINES AND DIETARY SUPPLEMENTS****S Basnet, P Adhikary and B Aryal***

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E-mail: phrbijayaryal@gmail.com***ABSTRACT**

Complementary and Alternative Medicine (CAM) is a group of diverse medical and health care systems, practices and products that are not presently considered to be a part of conventional medicine. Primary reasons for the use are to relieve symptoms associated with chronic, even terminal illnesses or the side effects of conventional treatments or having a holistic health philosophy or cultural belief. In Nepal, the Ayurvedic system is most widespread and reasons for this had no or less side effect as well as more effective for chronic patients. Drug interactions can occur at the pharmaceutical, pharmacodynamic, or pharmacokinetic level. Herbals and dietary supplements containing St John's Wort (*Hypericum perforatum*), ginkgo (*Ginkgo biloba*), kava (*Piper methysticum*), digitalis (*Digitalis purpurea*), willow (*Salix alba*), magnesium, calcium and iron were documented to have the most interactions with individual medications. Warfarin, insulin, aspirin, digoxin, and ticlopidine had the greatest number of reported interactions with those preparations. Since, half of the Nepalese populations use CAM therapy, the healthcare professionals should pay attention towards such interactions.

Key Words: *Complementary and alternative medicines, Dietary supplements & Drug interactions.*

INTRODUCTION

Complementary and alternative medicine (CAM) covers a heterogeneous spectrum of ancient to new-age approaches that purport to prevent or treat disease. According to US National Center for Complementary and Alternative Medicine (NCCAM) a group of diverse medical and health care systems, practices and products that are not presently considered to be a part of conventional medicine is termed as CAM. ¹ Complementary interventions are used together with conventional treatments, whereas alternative interventions are used instead of conventional medicine.

In US, it is estimated that > 50% of patients with chronic diseases or cancers use herbs and dietary supplements (HDS), ² and nearly one-fifth of patients take HDS products concomitantly with prescription medications. ^{3,4}

According to a survey conducted by WHO, traditional healers treat about 85% of the total patients in Nepal. Ayurveda, Amchi, Homeopathy associating with Unani, Naturopathy are the important traditional health system existing in Nepal. ⁵ In Nepal, the Ayurvedic system is widespread and the Ayurvedic medicines are provided both by trained practitioners and hereditary Baidyas. ⁶ A study showed that Ayurveda (58%) was the most popular form of CAM therapy among the 18 different CAM therapies available. ⁷

The use of CAM therapy

People choose CAM therapy to improve their health and well-being ^{8,9} or to relieve symptoms associated with chronic, even terminal illnesses or the side effects of conventional treatments for them ^{10,11} or because they find these health care alternatives to be more congruent with their own values, beliefs, and philosophical orientations toward health and life. ¹² Among cancer patients, it is more common for those who suffer from fears, uncertainties and dissatisfaction. ¹³ A study in Ireland found that CAM users are more likely to be well educated, affluent, middle-aged and employed. Irish persons suffering from pain, anxiety and depression are also more likely to use CAM. ¹⁴

Studies carried out in Nepal have shown that more than 50 % of the population use CAM because of culture, lack of health facility and expensiveness of modern allopathic medicine and CAM practices are found common in both the rural and urban areas of Nepal. ¹⁵ In another study, the most cited reasons for this were no or less side effect as well as more effective for chronic patients. ⁷ Similar study show that the patients with a higher education level, higher income, and aged above 40 years were found more likely to use CAM. ¹⁶

Drug interactions

CAM and drug interactions can occur at the pharmaceutical, pharmacodynamic, or PK level.¹⁷

Government agencies in the United States (Food and Drug Administration) and Europe (European Medicines Agency), as well as the pharmaceutical industry have acknowledged that transporters play a key role in the absorption, distribution, and excretion of many clinical therapeutics. Organic anion transporter 1 (OAT1), OAT3, and OAT4 are among the transporters identified, thus far, to impact the pharmacokinetics, and hence dosing, efficacy, and toxicity, of some drugs. Further, many endogenous substances, including hormones, neurotransmitters, and toxins, have been identified as substrates and/or inhibitors of OATs.^{18,19} Although many studies have exhibited OAT-mediated drug interactions for synthesized drugs, relatively little is known about the potential interaction between OATs and natural products, including various organic anions, phenolic acids, and flavonoids found in herbal supplements and food. Several dietary flavonoids and their metabolic conjugates (e.g., sulfates and glucuronides) were identified as potent inhibitors and/or substrates of human (h) OAT1, hOAT3, and hOAT4.^{20,21}

Herbals and dietary supplements (HDS) containing St John's Wort (*Hypericum perforatum*), ginkgo (*Ginkgo biloba*), kava (*Piper methysticum*), digitalis (*Digitalis purpurea*), willow (*Salix alba*) magnesium, calcium and iron were documented to have the most interactions with individual medications. Warfarin, insulin, aspirin, digoxin, and ticlopidine had the greatest number of reported interactions with those preparations. Medications affecting the central nervous system or cardiovascular system had more documented interactions with HDS.²² Patients using medications that have a narrow therapeutic range (i.e. warfarin, digoxin) were at greater risk for adverse outcomes because of HDS–drug interactions.²³

CONCLUSION

Patients often add herbal medicines to medications prescribed by their physicians, yet do not always inform the physician. A major challenge for healthcare providers in counseling patients about CAM is that the available clinical evidence may be ambiguous and sometimes conflicting for HDS adverse events and drug interactions. It is recommended that healthcare professionals should pay more attention towards those pairs of interactions between any HDS products that contain St John's Wort, magnesium, calcium, iron and ginkgo, and medications that affect the CNS or the cardiovascular system.

Since half of the Nepali population undergoes CAM therapy, the health professionals working here should always consider this fact. There is a need for greater awareness that adverse reactions apparently due to a conventional medicine, might in reality be due to a herbal medicine or a drug interaction between a herbal medicine and a conventional drug, particularly when a health professional is unaware of the extent of a patient's self-medication with alternative therapies.

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