

Chapter 8

Herbal Drug Interactions

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ABSTRACT

Use of complementary and alternative medicines (CAM) for preventive and therapeutic purposes has increased tremendously in the last two decades internationally. The manufacturers of these products are not required to submit proof of safety or efficacy to the Food and Drug Administration. As a result, the adverse effects and drug interactions associated with them are largely unknown. In this chapter, the author presents interactions of herbal medicines with other medicines (herbal or non-herbal). A large number of herbal drugs, including from single drug to a variety of mixtures have been used to treat kidney disorders. Herb-herb or herb drug interaction has been reported intensively during last decade, therefore it becomes important to keep an eye on the use of combination herbal therapy in order to avoid serious results because of interactions with each other. Due to the growing awareness about the interactions and side effects of herbal drugs/supplements over the past few years, regulatory bodies are working on these issues and pharmacopoeias are being developed for reference.

INTRODUCTION

The herb drug interaction topic is so vast that a full volume of a book could be dedicated to it. Use of herbal products for preventive and therapeutic purposes has increased tremendously over the last two decades.

More than 130 distinct chemical substances which are derived from plants are in use as drugs. Production of modern pharmaceutical compounds requires adherence to good manufacturing practice (GMP). Rigorous safety and efficacy studies are essential before getting approval from regulation bodies for human use. The same is not true with herbal drugs and supplements however as this system is based more on traditional knowledge. Herbal medicines, often dispensed in a crude form of their extracts, form the mainstay of health care for a more than 50% of the population in developing countries due to either non-availability of modern medical care, its cost, or lack of health care knowledge (Brandt and Muller, 1995; Roshni et al., 2014). A large portion of the population in sub-Saharan Africa depend on

DOI: 10.4018/978-1-6684-3546-5.ch008

traditional medicine for its primary health care, whilst 50% of the Chinese population use herbal therapy (Chen et al., 2007). The global annual turnover in herbal medicines is estimated at US\$ 60 billion, representing approximately 20% of the overall drug market (Gunjan et al., 2015). CAMs are perceived to be innocuous and safe, therefore there is ignorance of side effects or potential risks of interactions with other drug substances. Chemical compounds, present in crude herbs or their extracts, are responsible for their pharmacological actions. For example, Ginseng (*Panax notoginseng*, family: Araliaceae), which is widely used in China for the treatment of various diseases like cardiovascular, neuropathy or blood disorders, is believed to be safe, though some rare side effects such as anxiety, insomnia, or pain have been reported. Also, a large number of herbal-drug interactions have been reported, e.g. ginkgo products causing bleeding or seizures (Kupiec & Raj, 2005).

BACKGROUND

The kidney is an essential organ when it comes to detoxification of the body. A large number of substances are excreted through the kidney making it vulnerable to toxins. A number of therapeutic drugs can adversely affect the kidney resulting in acute kidney injury (AKI), nephritic syndrome and chronic interstitial nephritis. Medicinal plants are used for the treatment of various diseases (also called 'Herbal medicine' or 'phytomedicine'). Although herbalism has a long tradition of use outside conventional medicine, it is becoming more mainstream as improvements quality control, and clinical research, show the value of herbal medicine in treating and preventing disease. In general, four types of herbal medicine exist: Asian, European, Indigenous, and Neo-Western. The Asian and European systems go back thousands of years, appear in pharmacopoeia, and with such a tradition of use, are better understood than those of indigenous origins that are often only orally recorded (Desmet, 1996). Pharmacopoeia is an official book published usually under the jurisdiction of the government and which contains a list of drugs, their formulas, and methods of identification, requirements and tests for their strength and purity, and other related information. The ones which are most established are of Asian origin, particularly from India (Aryurvedic, Unani, Siddha), China (Wu-Hsing), and Japan (Kampo). Regulatory bodies of various countries have become conscious about the various aspects of herbalism and thus prepared official monographs of these medicines regarding their identity, purity, and analysis. In India a well-established ministry (Ministry of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy (AYUSH)) looks after these five systems of indigenous medicines that are widely practiced in India. For every system of medicine, there is an official pharmacopoeia, for instance, India has Unani Pharmacopoeia, and Aryurvedic pharmacopoeia. America has the American Herbal Pharmacopoeia. In the Pharmacopoeia of the People's Republic of China (PPRC) volume 1 covers the Traditional Chinese Materia Medica, including Traditional Chinese Patent Medicines, while Volume 2 is dedicated to conventional pharmaceuticals.

The concomitant use of herbal medicines and modern medicine is wide spread globally because of the ready availability. The clinical consequence of herb-drug interactions varies, from being well-tolerated to moderate or serious adverse reactions, even possibly life-threatening. Izzo and Ernst have published a review about interactions between herbal medicines and prescribed drugs (2009). They reported the possible interactions between seven popular herbal medicines: ginkgo, ginseng, St John's wort, Echinacea, garlic, saw palmetto, and kava, and conventional drugs. They found that St John's wort (*Hypericum perforatum*), reduces the plasma concentrations (and/or increases the clearance) of alprazolam, amitriptyline, ciclosporin, atorvastatin, chlorzoxazone, debrisoquine, erythromycin, digoxin, fexofenadine, glyclazide,

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