

# Adverse Effects of Herbs and Drug-Herbal Interactions

Mrs. Badhe. M. S, Priyanka Potane, Dipali Kurkute, Mahek Shaikh, Aditi Thorat, Bhakti Matkar  
Samarth College of Pharmacy, Belhe, Maharashtra, India

**Abstract:** *Many people have turned away from conventional medicines, with the belief that 'natural' substances like herbs are safer than synthetic substances. This belief is augmented by many other unwarranted claims such as herbal products do not contain chemicals while conventional medicines do, thus contributing to the latter's side effects. The increasing use of herbal medicines has resulted in concern about the efficacy and safety of these products. Herbs can be hazardous in many ways. They may be intrinsically toxic or toxic when taken in combination with other preparations. Because herbal preparations are usually not evaluated for purity and consistency of active compounds, they often contain contaminants. Inclusion of incorrect but toxic species, allergens, pollen, insect parts, heavy metals such as lead, mercury and arsenic and scheduled poisons (drugs), whether intentional or unintentional, have been cited as the causes of herbal adverse reactions or toxicities. The increasing use of herbal medicines means that there is potential for more drug interactions, particularly between herbal products and conventional 'Western' medicines. Toxicity and drug-local herb interaction studies are scarcely conducted and therefore should be encouraged. Proper documentation of adverse effects of herbs should be initiated and patients should be asked about their use of herbal products in order to evaluate the potential of these products to interact with concurrent prescription medications. The public should be made aware of the adverse effects of herbal products*

**Keywords:** herbs, adverse effects, safety, herbal toxicities, drug-herbal interactions

## I. INTRODUCTION

Herbal medicines refer to the use of plants for the promotion of healing and maintenance of health. It is said that the use of herbal medicines originated in Egypt back in 1550 BC, yet many of their pharmacological effects remain poorly understood. Out of the estimated 800,000 plant species on Earth (1), about a quarter have been categorized and only a small fraction of these have been examined for pharmacological efficacy. The search continues for more medications from plant sources to help treat the many diseases which still plague society. An herb is defined as a plant or plant part used for its aromatic, savoury, medicinal or cosmetic properties. Generally, the whole plant or plant parts are used singly or in combination with more than one plant for the purpose of treatment. However, the herbal industry now produces herbal products containing isolated chemicals or extracts of single plants in modern pharmaceutical dosage forms. This practice is against that of traditional herbal practitioners who support the use of the whole plant or plant parts, as they believe that there is synergism or antagonism among the many constituents and that the pharmacological activity depends on their combined effects.

## II. HERBAL USAGE

Herbal remedies have been in use for thousands of years by indigenous tribes and cultures like the Africans, Indians, and Chinese. Before we had synthetic medicine in the West, our apothecaries were similarly full of medicinal herbs and folk therapies. Herbal medicine is the use of plants to treat disease and enhance general health and wellbeing. The safety of herbal medicines is of particular importance because the majority of these products is self-prescribed and is used to treat minor and often chronic conditions. However, most patients consuming herbal preparations are not aware of the potential adverse effects these preparations may produce. The first reason for the use of herbals is that it is part of the culture and belief of some people for maintenance of health or to treat certain ailments. The second reason for the increased use of herbals is the relatively cheaper cost of herbal products and hence affordability to the lower income group. This was particularly true a few years ago, but nowadays, it is not surprising to find some herbal products in the

local market which are expensive; and in fact, more expensive than modern medicines. Also, the easy availability of herbals makes them more accessible by comparison to conventional medicines where one has to obtain a prescription from a doctor. The availability of information with the advent of the Internet certainly has some effect on the increasing trend of self-medication. The third reason is that the public has the impression of herbals being natural and that anything natural is safe. There is also this notion that herbal products do not contain chemicals and that chemicals, only found in modern medicines, are linked to toxicity, more adverse effects and hence are more harmful. Not only are these ideas propagated by irresponsible, uneducated and unscrupulous salespersons at the 'pasar malam' (night market) and bazaars, unfortunately they have also been broadcasted in privately sponsored radio programmes. Herbal remedies are plants used like a medicine. People use herbal remedies to help prevent or cure disease. They use them to get relief from symptoms, boost energy, relax, or lose weight. Herbal remedies are not regulated or tested like medicines.

### **III. NEEDS OF HERBAL MEDICINE STANDARDIZATION**

Plant derived drugs are used to cure mental illness, skin diseases, tuberculosis, diabetes, jaundice, hypertension and cancer. Modern system of medicine is based on sound experimental data, toxicity studies and human clinical studies. But, Pharmacopoeial standards on raw material / finished products are not available. cGMP for herbal industry are not well defined nor the barest minimum standards of medicinal plant products are maintained or regulated. The lack of quality standards has resulted in mild to serious adverse effects ranging from hepato toxicity to death. Hence, herbal ingredients require tools for determining identity, purity and quality and tools have to be technically sufficient, rapid and cost effective with GMP requirements. World health organization has set specific guidelines for the assessment of safety, efficacy and quality of herbal medicines. Standardization of herbal drug is not an easy task as numerous factors influence the bioefficacy, reproducible therapeutic effect. In order to obtain quality oriented herbal product care should be taken right from the proper identification of plants, season, area of collection, their extraction and purification and rationalizing the combination in case of polyherbal drugs.

### **IV. ADVERSE EFFECTS OF HERBALS**

It is undeniable that plants have an important role in the development of modern medicines. More than 60–70 % of modern medicines in the world market are directly or indirectly derived from plant products. In the last few years, research has uncovered interesting and beneficial chemicals in herbs. However, herbs are not non-toxic just because they are natural. Medicinal herbs contain powerful, pharmacologically active compounds. While some herbs in common use appear to be fairly safe, all medicines, herbal or otherwise, should be used with caution. The number of reports of adverse effects of herbal medicines is now increasing due to increased use and also probably due to increased awareness among the consumers and clinical practitioners. In Malaysia, adverse effects of herbal (traditional) medicines are reported to the Malaysian Adverse Drug Reaction Advisory Committee (MADRAC), National Pharmaceutical Control Bureau, Ministry of Health. The number of reports of adverse reactions attributable to traditional medicine has increased from 11 in 1997 to 23 in 1999. Adverse effects or poisoning pertaining to herbals reported to the National Poison Centre from 1995 to June 2000 are as follows: 8 cases (1995), 3 cases (1996), 5 cases (1997), 11 cases (1998), 7 cases (1999) and 9 cases (until June 2000). The list of herbals involved include *Datura fastuosa* ('kecubong'), *Datura metel* ('kecubong'), *Datura stramonium* ('terongpengar') *Pithecolobiumjiringa* ('jering'), *Ganoderma mycelium* ('kulatkayu'), lemon grass ('serai'), margosa ('daunmambu'), nutmeg (*Myristica fragrans*), eucalyptus (*Eucalyptus globulus*), yohimbine, cassava ('ubi kayu'), camphor, stephamine, 'Air Abu Kansui', 'Minyak Rohini', 'Yu Yee' oil, 'Pil Kuda', 'Minyak Angin', 'Slimming gel' (Pusat Racun Negara – personal communication). The most common adverse effects reported are hepatic and renal problems. However, it is difficult to identify the causative agent associated with the adverse reactions encountered because traditional herbal preparations often contain multiple ingredients. The above number of reported cases most probably does not reflect the actual frequency of adverse reactions caused by traditional herbal preparations, as most cases go unreported.

Commonly Prescribed Medicines from Around the World

#### **1. Hydrocodone**

- Hydrocodone was first patented in 1923, with the long-acting formulation being approved in 2013. It is widely known as the active ingredient for prescription pain relievers.

- Hydrocodone is usually prescribed as a last resort because it can lead to addiction. Because it is addictive, the drug is subject to a written controlled prescription from a doctor every time it has to be filled.
- Hydrocodone, along with homatropine, is used to relieve cough. Hydrocodone is a narcotic antitussive or a cough suppressant, acting directly on the brain's cough center for relief.

## 2. Metformin

- It is a prescribed medicine used to treat type 2 diabetes and even prevent it if someone is at a high risk of developing the disease by lowering blood sugar levels.
- The drug was proven useful in treating influenza when it lowered blood glucose levels in the 1940s. This was further studied by French physician Jean Sterne and was first to report metformin to treat diabetes in 1957.
- Metformin is best taken with a meal to reduce its side effects.

## 3. Losartan

- It is used to treat high blood pressure by blocking a substance in the body that causes the blood vessels to tighten. This is taken in tablet form, according to the doctor's prescription.
- Losartan also lowers the risk of stroke in patients with high blood pressure and cardiomegaly or enlarged heart. Type 2 diabetes patients and those with a history of hypertension also take it to address kidney problems.

## 4. Antibiotics

- These are prescribed medicines that fight off bacterial infections. First discovered in 1928 by Alexander Fleming, this drug kills bacteria and eradicates them from the body. Viral infections like colds, runny noses, most sore throats (except strep throat), flu, and bronchitis cannot be treated with antibiotics.
- When not needed, misused, or not fully used according to prescription, antibiotics can do more harm than good and produce side effects.

## 5. Albuterol

- Wheezing, coughing, and other related conditions caused by lung. This medicine prevents and treats breathing difficulties, diseases like asthma. It relaxes the air passages and opens them up to make breathing easier. Albuterol is usually taken orally using a special jet nebulizer or an inhaler.
- Herbal remedies have been in use for thousands of years by indigenous tribes and cultures like the Africans, Indians, and Chinese. Before we had synthetic medicine in the West, our apothecaries were similarly full of medicinal herbs and folk therapies.

## 6. Antihistamines

- These are commonly used to treat allergies and symptoms such as sneezing and rashes. Allergies happen when the body reacts to a "foreign substance" and activates its defense mechanism, including histamine. The drugs are also used to treat various conditions such as colds, stomach problems, and anxiety.

## 7. Gabapentin

- It is an antiepileptic/anticonvulsant drug used with other medications to prevent and control seizures. It is taken orally with or without food. Doctors would usually prescribe the patient to take it regularly to maximize its benefits. Patients are also advised to stop taking gabapentin only with a doctor's approval.

## 8. Omeprazole

- This medication is usually prescribed to someone experiencing gastroesophageal reflux disease (GERD) and erosive esophagitis. GERD is a condition where too much acid is in the stomach, causing symptoms such as

belching or burping, heartburn, indigestion, and even flatulence (farting). It is omeprazole's job to reduce the acidity in the stomach and help heal the esophagus and stomach from acid damage.

### 9. Levothyroxine

- It is used to treat an underactive thyroid gland condition called hypothyroidism. Thyroid hormones are essential to the body's every cell and organ because they regulate the rate at which calories are burned, affecting both weight loss and weight gain.
- Thyroid hormones also regulate the heartbeat, control the way muscles contract, and influence the rate of how fast dying cells are replaced. Levothyroxine is taken to make up or replace the missing thyroid hormone called thyroxine.

### 10. Atorvastatin

- This is prescribed to reduce the risk of a heart attack. This drug is also used to decrease the chances of undergoing heart surgery. Moreover, atorvastatin is used to lower the levels of fatty substances like low-density lipoprotein (LDL) or bad cholesterol and triglycerides in the blood with the goal of increasing the good cholesterol or high-density lipoprotein (HDL).

## V. CONCLUSION

When used wisely, herbal medicines have a place in the control of certain ailments and diseases. From the above discussion, findings by many researchers have reinforced the idea that the use of natural herbal medicines may not be without risk. In the U.S., nearly 70% of patients who use herbal medicines do not inform their health care providers about their use of herbal therapies (18). More research on adverse reactions on locally available herbal preparations should be encouraged and public education on the good and bad effects of herbals need to be emphasized. Health care professionals should remain vigilant for potential interactions between herbals and prescription medications, especially when it involves medications with narrow therapeutic indices.

## ACKNOWLEDGEMENT

Medicinal herbs, have been discovered and used in traditional medicine practices since prehistoric times.

## REFERENCES

- [1]. von Reis Altschul S. Exploring the herbarium. *Sci Am* 1977; 236: 96-114.
- [2]. Phillipson JD. Global trend and market size of herbal medicine in primary health care. In: Chan KL, Hussin AH, Sadikun A, Yuen KH, Asmawi MZ, Ismail Z, editors. *Trends in Traditional Medicine Research*. Penang: Universiti Sains Malaysia; 1995. 3. Johnstone BA. One third of nation's adults use herbal remedies. *Herbalgram* 1997;40:49.
- [3]. Center for Disease Control, Atlanta, Georgia. *Morbidity and Mortality. Weekly Report* 1978; 27:51.
- [4]. Dobb GJ, Edis RH. Coma and neuropathy after ingestion of herbal laxative containing podophyllin. *Med J Aust* 1984; 140:495-496.
- [5]. MacGregor, FB, Abernethy VE, Dahabra S. Hepatotoxicity of herbal remedies. *BMJ* 1989; 299:1156-1157.
- [6]. Nortier JL, Martinez MC, Schmeiser HH, et al. Urothelial carcinoma associated with the use of a Chinese herb (*Aristolochia fangchi*). *N Engl J Med* 2000; 342:1686-1692.
- [7]. Arlt VM, Pfohl-Leszkowicz A, Cosyns J, et al. Analyses of DNA adducts formed by ochratoxin A and aristolochic acid in patients with Chinese herbs nephropathy. *Mutat Res* 2001; 494:143-150.
- [8]. Tanaka A, Nishida R, Maeda K, et al. Chinese herb nephropathy in Japan presents adult-onset Fanconi syndrome: could different components of aristolochic acids cause a different type of Chinese herb nephropathy? *Clin Nephrol* 2000; 53:301-306.
- [9]. Anonymous. Chinese herbal medicines. *Clin Toxicol* 1975; 8:137-138.
- [10]. Ahsan AA. Ubatradisionalurutrosakkanbuahpinggang (Traditional medicines cause kidney damage) *Utusan Malaysia*. 2000; 5 Aug. p 2.

- [11]. Shakri MHM. 95% ubat tradisionalada steroid (95% Of traditional medicines contain steroids) .Mingguan Malaysia 2000; 3 September. p. 17.
- [12]. Chan H, Yeh YY, Billmeier GJ, Evans WE. Lead poisoning from ingestion of Chinese herbal medicine. Clin Toxicol 1977; 10:273-281.
- [13]. Parsons JS. Contaminated herbal tea as a potential source of chronic arsenic poisoning. N Carolina Med J 1981; 42:38-39.
- [14]. Kleijnen J, Knipschild P. Gingko biloba. Lancet 1999; 340:1136-1139.
- [15]. Hussin AH, Ariff AM, Husin M, Taher Y. Influence of Petai (Parkia speciosa ,Hassk) on drug metabolism in rat liver J Biosci 1999; 10:7-10.
- [16]. Hussin AH, Zulkifli M, Hadijah MT, Zainah A. Invitro effect of Pithecallobiumjiringa (jering) and Pithecallobiummicrocarpus (kerdas) on hepatic drug metabolism. In: Abstract Book of the 15th Scientific Meeting of the Malaysian Society of Pharmacology and Physiology; 2000 May 8-9;
- [17]. Kubang Kerian: Malaysian Society of Pharmacology and Physiology, 2000. p. ORL32. 18. Eisenberg DM, Kessler RC, Foster C. Unconventional medicine in the United States : prevalence, costs and patterns of use. N Engl J Med 1993; 328:246-252.
- [18]. <https://mjpharm.org/adverse-effects-of-herbs-and-drug-herbal-interactions/>
- [19]. <https://www.makatimed.net.ph/blogs/10-most-prescribed-medicines/>
- [20]. <https://www.ncbi.nlm.nih.gov/books/NBK92773/#:~:text=The%20major%20use%20of%20herbal,face%20of%20new%20infectious%20diseases>