

A REVIEW ON BENEFITS AND TOXICITIES OF SOME POPULAR HERBS

Pawar Harshal Ashok^{1*}, Pawar Sandip², Pawar Prashant A³

¹Dr.L.H.Hiranandani College of Pharmacy, Smt.CHM Campus, Ulhasnagar, Dist.Thane, Maharashtra, India

²Executive –Technology Transfer, Sandoz Pvt.Ltd, MIDC, TCC Ind. Area, Kalwe, Dist. Thane, Maharashtra, India

³Manufacturing Chemist, Wardex Pharmaceutical Pvt.Ltd. Mahalaxmi, Mumbai, India

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ABSTRACT

Herbal medicines are being used by about 80 per cent of the world population, mainly in the developing countries for primary healthcare. It is assumed that all the herbs and the products made thereof are safe and free from undesirable side effects. But this assumption is wrong and there are many scientific evidences which prove that herbs may possess toxicity or can produce undesirable side effects. The present communication reports benefits and toxicities of some well-known medicinal plants which are used more frequently in traditional system of medicine.

KEY WORDS: Herbal Drugs, Toxicity of Herb, Traditional Medicines, Popular Medicinal Plants, Side Effects, Herbal Remedies

*Author for Correspondence

Mr. Harshal Ashok Pawar, Lecturer, Department of Pharmacognosy, Dr.L.H.Hiranandani College of Pharmacy, Smt.CHM Campus, Opposite Railway Station, Ulhasnagar, Dist.Thane, Pin-421003 Maharashtra (India)

Email: hapkmk@rediffmail.com

INTRODUCTION

Herbal medicines as potential source of therapeutic aid plays vital role in Health care system all over the world for both humans and animals not only in the diseased condition but also as potential substance for maintaining proper health.

Major population of the world still relies on traditional herbal remedies for their primary healthcare. It is estimated that about 70,000 plant species from the entire flora of the world have been used for medicinal purpose. The Chinese Pharmacopoeia lists over 5,700 traditional medicines whereas Ayurveda reports about 2,000 plant species which are known to have medicinal value¹.

The lack of information on the socioeconomic benefits that could derive from the industrial utilization of medicinal herbs is a major factor which hinders the development of the medicinal plant based industries. It is noticed that very less information is available on market potential and trading possibilities of these plants except their use for local health care needs.

Toxicity does not only refer to lethal effects but also to minor body reactions such as allergy, irritation and sensitivity. It is believed that herbal drugs being natural products have no toxicities or side/adverse effects. But in true sense most herbal drugs and their product have the potential to be harmful if consumed improperly or in

excessive amounts.² There is limited information in the literature regarding proper usage of medicinal herbs such as dosage frequency and usage period, physical condition and sensitivity of the user and possible interaction with prescribed drugs.³

Many people already involved in modern pharmaceutical therapies seeking herbal medical treatment. In such cases an understanding of conventional drugs is an essential prerequisite for effective herbal therapeutics as herbal remedies may act either as agonists or may potentiate some drug of modern therapy. The present review highlights benefits and adverse effects/ toxicities of some popular medicinal plants which are used very frequently in the traditional system of medicine.

ALOE (*Aloe vera*)

Benefits

Aloe is promoted to heal wounds, burns, skin ulcers, frostbite and dry skin. Aloe is also used as laxative.

Toxicity

Excessive use of Aloe leads to severe diarrhea or kidney problems. It causes diuresis and thus worsens some cardiovascular and kidney problems. It may also interact with some prescription drugs like steroids, diuretics etc. The latex of this herb is poisonous if ingested, may induce kidney inflammation and hemorrhoids. Abdominal spasms and pain may occur after even a

single dose. WHO states that chronic abuse of anthraquinone stimulant laxative may lead to hepatitis^{4,5}.

COMFREY (*Symphytum officinale*)

Benefits

Comfrey is currently promoted for treatment of rheumatic and pulmonary disorders and for treatment of injuries such as burns and bruises. A chemical substance allantoin which is present in the roots and leaves of this plant helps to grow new skin cells, reduce inflammation and keep skin healthy.

Toxicity

This herb contains pyrrolizidine alkaloids which are highly toxic to the liver and may cause death. Clinically confirmed cases of liver damage because of long term chronic consumption of comfrey preparation have been reported recently all over the world. Therefore, U.S. and many European countries have banned Oral comfrey products in their area^{6,7}.

FEVERFEW (*Tanacetum parthenium*)

Benefits

The name of this plant is derived from the Latin word 'febrifugia' meaning "fever reducer." As the name indicates this herb is used for reducing fever. It is also indicated in arthritis and digestive problems. This herb is most commonly used in prevention of migraine headache. It is believed that feverfew limits the inflammation of blood vessels in head by inhibiting the release of serotonin and prostaglandins.

Toxicity

Some allergic reactions have been reported with feverfew preparations e.g. allergic contact dermatitis by topical creams of Feverfew. It also causes gastrointestinal disturbances like nausea, vomiting, pain, diarrhea, and flatulence. Chewing of this herb causes ulceration of oral mucosa, swollen tongue and numbness of the mouth^{8,9}.

GINKGO (*Ginkgo biloba*)

Benefits

Ginkgo is widely used in France and Germany as licensed herbal remedies for treatment of circulatory insufficiencies (Peripheral and cerebral). At present it is used in diabetes-related circulatory disorders, impotence and vertigo.

Toxicity

Seeds of Ginkgo contains ginkgotoxin which is neurotoxin anti-vitamin B-6. Ginkgo should not be given to the individuals who are taking anticoagulants such as aspirin, warfarin etc. or certain types of antidepressants (Monoamine oxidase inhibitors and selective serotonin reuptake inhibitors) as it interact with these drugs and shows undesirable effects. It is also not used by pregnant women without prior consulting a doctor^{10,11}.

GINSENG (*Panax ginseng*)

Benefits

Ginseng is widely renowned for its adaptogenic property in Eastern countries where it is used to help the body cope with stress and fatigue, and to promote recovery from illness or imbalance such as hypertension or hypoglycemia. Ginseng to a certain extent is supported with reference to its anticarcinogenic and antioxidant properties. It is used as a tonic for stimulating the user physically, mentally and sexually.

Toxicity

In excessive doses ginseng may cause hypertension. In recommended doses it may cause mastalgia and vaginal bleeding^{12,13}.

LIQUORICE (*Glycyrrhiza glabra*)

Benefits

Traditionally, liquorice has been used as an expectorant and demulcent. Because of mineralocorticoid activity (Glycyrrhetic acid), it is employed in place of corticosteroids for the treatment of rheumatoid arthritis, inflammation and Addison's disease.

Glycyrrhiza inhibits Helicobacter pylori, thus help in healing stomach and duodenal ulcers. It is antispasmodic in the bowels and can be used to treat irritable bowel syndrome and Crohn's disease.

Toxicity

Overuse of liquorice is harmful to liver and cardiovascular system, and may cause hypertension and oedema. The heavy doses may cause sodium retention consequently leading to hypertension, water retention and severe electrolyte imbalance. Excessive consumption of liquorice has been reported to cause cardiac arrest^{14,15}.

PARSLEY (*Pteroselinum crispum*)

Benefits

The common uses include diuretic, stomachic, carminative, irritant and emmenagogue. The medicinal value of parsley is because of its volatile oil content. The volatile oil of obtained from parsley contains myristicin and apiole which is responsible for its diuretic effect.

Toxicity

The seeds oil of parsley causes uterine contraction and sometimes may lead to abortion. The irritant principle (Apiole) of the volatile oil is responsible for the abortifacient action and is also reported to cause hepatotoxicity.

Parsley contains considerable amounts of oxalates which when become too concentrated in human body fluids may gets crystallize and cause serious health problem¹⁶.

POKROOT (*Phytolacca americana*)

Benefits

It is widely used in treatment of catarrh, dyspepsia, granular conjunctivitis and rheumatism.

Toxicity

The toxic effects of Pokroot include severe gastrointestinal irritation with intense abdominal cramping and haematemesis^{17, 18}.

SASSAFRAS (*Sassafras albidum*)

Benefits

Internally used for gastrointestinal complaints, colic and menstrual pain. Externally for sore eye, lice and insect bites.

Toxicity

The principle component of sassafras volatile oil is safrole, which is known to be hepatotoxic^{19, 20}.

ST. JOHN'S WORT (*Hypericum perforatum*)

Benefits

St. John's wort is the most commonly used herbal remedy in the treatment of nervous conditions like anxiety, depression and few sleep disorders. In United State and many other countries it is still available as over the counter herbal remedy. It is used as prescription drug in Ireland and Germany.

Toxicity

The most important risk is photosensitization, which is however without clinical relevance in the recommended dosages. The mild side effects found to be associated with this herb which includes stomach upset, skin rash, restlessness, fatigue, headache, dry mouth and dizziness^{21, 22}.

CALAMUS OR SWEET FLAG (*Acorus calamus*)

Benefits

Both roots and leaves of *A. calamus* have shown strong antioxidant and antimicrobial activities. The root is anodyne, aphrodisiac, aromatic, carminative, diaphoretic, emmenagogue, expectorant, febrifuge, hypotensive, sedative, stimulant, stomachic, mildly tonic and vermifuge.

Toxicity

Calamus and its products derived from Calamus were banned in United State by Food and Drug Administration as food additives and medicines. This ban was the result of lab studies that involved supplementing the diets of lab animals over a prolonged period of time with massive doses of isolated chemicals (β -asarone) from the Indian Jammu strain of calamus. The animals developed tumors, and the plant was labeled procarcinogenic. In reality β -asarone is not actually a carcinogen but it is a procarcinogen that is neither hepatotoxic nor directly hepatocarcinogenic. It must first undergo metabolic 1'-hydroxylation in the liver before achieving toxicity. Cytochrome P450 in the hepatocytes is responsible for secreting the hydrolyzing enzymes that convert β -asarone into genotoxic epoxide structure^{23, 24}.

EPHEDRA (*Ephedra sinica*)

Benefits

Ephedra is both a stimulant and a thermogenic; its biological effects are due to its ephedrine and pseudoephedrine content. These compounds stimulate the brain, increase heart rate, constrict blood vessels (increasing blood pressure), and expand bronchial tubes (making breathing easier). Their thermogenic properties cause an increase in metabolism, evidenced by an increase in body heat.

Toxicity

Ephedra-containing dietary supplements have been linked to a high rate of serious side effects and a number of deaths, leading to concern from the U.S. Food and Drug Administration (FDA), the National Center for Complementary and Alternative Medicine, and the medical community.

Side effects of ephedra may include severe skin reactions, hypertension, irritability, nervousness, dizziness, trembling, headache, insomnia, profuse perspiration, dehydration, itchy scalp and skin, vomiting, hyperthermia, irregular heartbeat, seizures, heart attack, stroke, or death^{25, 26, 27}.

DEVILS CLAW (*Harpagophytum procumbens*)

Benefits

The two active ingredients in Devil's Claw are harpagoside and beta-sitosterol. It is claimed that these have anti-inflammatory properties. The British Herbal Pharmacopoeia recognizes Devil's Claw as having analgesic, sedative and diuretic properties. Most studies involve chronic use rather than acute treatment of pain. Devil's Claw is also claimed to be beneficial for treating diseases of the liver, kidneys, gallbladder and bladder, arthritis and rheumatism. It is said to help alleviate problems with and improve the vitality of the joints, as well as stimulating appetite and aid digestion, increase cholesterol and fatty acids in the blood. Devil's Claw has been recommended for treating diabetes, hardening of the arteries, lumbago, gastrointestinal disturbances, menstrual difficulties, neuralgia, headache, heartburn and gout.

Toxicity

Devil's claw may interfere with the action of Ticlopidine and Warfarin, and patients should consult with a physician before combining Devil's claw with these medications. In addition, Devil's Claw promotes the secretion of stomach acid, leading to difficulties in those with peptic ulcers, gastritis or excess stomach acid. Care should also be taken for individuals with gallstones^{28, 29, 30}.

MUGWORT (*Artemisia vulgaris*)

Benefits

Artemisia vulgaris is used as antimicrobial, antioxidant, digestive and emmenagogue. It is also used in the treatment of liver diseases. It also possesses anticancer activity.

Toxicity

Artemisia vulgaris should be used with caution in diabetic patient as it has been shown to increase blood glues level^{31, 32, 33, 34}.

SENNA (*Cassia angustifolia* or *Cassia acutifolia*)

Benefits

Senna is most commonly used as a laxative. It is also indicated in burns, constipation, intestinal worm infection, Psoriasis and tumors.

Toxicity

Senna may cause diarrhea, loss of fluids, hypokalemia, and abdominal pain/cramping. The long-term use of senna has resulted in pigmentation of the colon, reversible finger clubbing, cachexia, and dependency on the laxative. Various case reports of senna toxicity are available and include coma and neuropathy after ingestion of a senna-combination laxative, as well as hepatitis after long-term use of the plant^{35, 36, 37}.

CONCLUSION

Herbal medicines are being used by about 80 per cent of the world population, mainly in the developing countries for primary healthcare. Herbal remedies should be used with the same precautions that apply to allopathic drugs i.e. don't self medicate. No doubt that most of the herbs are safe for consumption, but for those without specialized knowledge, it is necessary to follow simple but prudent guidelines in self treatment which are as mentioned below:

- ✓ Don't use any herbal medicine haphazardly in the confidence that it is absolutely safe.
- ✓ Use only herbs recommended in official or standard reference books or compendiums.
- ✓ Avoid novel or unproven wonder herbal remedies.

It is very unfortunate to say that there is no internationally harmonized guidelines, training and licensing of herbalists. Increasing interest of both common consumers and health care professionals in herbal medicines prompted researchers to screen scientifically various claims regarding safety, efficacy and quality of medicinal plant materials.

To promote the safety of herbal medicines, systematic efforts to collect evaluate and disseminate data about their toxicity (Adverse reactions /side effects) should be initiated in our country.

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