

CACTUS GRANDIFLORUS: A HOMEOPATHIC REMEDY FOR CARDIAC AILMENT

Syed Ehtaishamul Haque*, Ravindra Kumar Verma, Vasim Khan, Sumit Sharma

Department of Pharmacology, Faculty of Pharmacy, Jamia Hamdard, New Delhi-110062.

***Corresponding Author:**

E-mail: sehaq@jamiyahamdard.ac.in

ABSTRACT

This review deals with homeopathic approach of treatment where focus is given to its principle, potency concept dosing pattern and symptomatic treatment. Special attention is given to a homeopathic drug Cactus grandiflorus. This review is a compilation of all therapeutic benefits of Cactus grandiflorus, giving more stress on cardioprotection.

Key words: *Cactus grandiflorus, cardioprotection, homeopathic medicine.*

INTRODUCTION

Herbs have been of immense importance in treating various human diseases and have played a major role in human pharmacotherapy. Plant constituents are used in/as various commercial preparations for example atropine, digitoxin, ephedrine, reserpine etc. However, there is a need of careful scientific assessment of these herbal drugs about their toxic effect and/or drug interactions, since inadequate pharmacological data is the main hurdle in using herbal drug for treatment of diseases. Additionally, herbs have been used less frequently nowadays, as compared to new synthetic medicines which are claimed to be more effective and reliable. This review mainly emphasize on cardiovascular diseases. Various herbs are known to show pleiotropic effects and thus cannot be prescribed in specific diseases. Therefore, detailed pharmacological analysis of these drugs is necessary to elucidate their specific role in conventional drug therapy. (1, 2)

Confusion between herbal and homeopathic medicine: Herbal and homeopathic medicine therapy are mostly considered as same because atleast one third of the homeopathic preparations are derived from herbs. But they differ significantly in terms of manufacturing process, potential toxicity and their indications. (3) Although, herbs are the major sources of homeopathic medicines but they are diluted to an infinitesimal amount

of their original substance left. In the year 2000, WHO has cited homeopathy as one of the traditional systems of medicine that should be included with the conventional medicine in order to provide adequate healthcare globally. FDA also recognizes homeopathic treatment as official and has provided regulations for their manufacturing, labeling and dispensing. (4, 5) However, wide variations in the pharmacological actions of herbs have been observed depending on their season of harvest, growth conditions and parts of plants used. Hence, there are rising concerns regarding the unknown toxicities of herb-herb or herb-drug interactions. (6, 7)

Homeopathy: In the fourth century, Hippocrates observed that certain natural substances produce symptoms in healthy individuals similar to those caused by disease. After that in 1790, Samuel Hahnemann, a German doctor, extended this hypothesis and named it as homeopathy. The word homeopathy derives from Greek word homo meaning "similar" and pathos meaning "suffering". Homeopathic medicines are generally dilutions of natural substances from plants, animals and minerals. Based on the principle of "like cures like", homeopathic medicines specifically match various symptoms of disease and play a role in stimulating the natural healing process of the body. (1, 4)

Principles of Homeopathy: (4)

- Like cures like
- More dilute the remedy, greater is its potency
- Principle of minimum dose
- Illness is specific to the individual

A substance that produces symptoms of illness in large doses can also cure it when given in smaller quantity. Similar concept of treatment is being utilized in case of immunization; however vaccines are different from homeopathic medicines as vaccines are not potent after dilution. The common belief of higher the dose of medicine, greater is its effect, does not hold true in homeopathy. In case of homeopathy, the reverse is true i. e. more a substance is diluted, more the potency is observed. Hahnemann revealed this law of Infinitesimal Dose by using large dilutions of substances to avoid toxic effects. (1, 4)

Homeopathic medicine is somewhat complicated as it involves choosing the right combination of remedy, dosage regime, potency etc. This is done by the classical homeopathic procedure of reportrizing. (4)

Reportrizing: It is a process of selecting a dosage regime for a patient by taking their interview. The homeopathic practitioners refer to the text of a homeopathic medical repertory after identifying the key symptoms and characteristics of the patient. The repertory is a catalog of symptoms (known as rubrics) which is divided into sections corresponding to each organ system of the body, including mind. Each rubric is provided with references to corresponding medicines which have been shown to induce particular symptoms. Homeopathic system of medicine suggests three laws of cure.

- Remedy starts working from top of the body to downward direction.
- Remedy works from major organs to minor.
- Symptoms disappear in reverse order of appearance. (4)

Potency concept:

Decimal (X): The potency based on the ratio of 1 part of substance to 10 parts of dilution is referred to as Decimal. It is denoted by X (in Europe denoted by D). X potencies are considered low potencies and are often used

for children, in case of sudden illness and first aid therapy.

Centesimal (C): The potency based on the ratio of 1 part substance to 99 parts dilution is known as centesimal potency. It is denoted with a C (or left blank in Europe). Centesimal potencies are considered medium potencies and are often used for seasonal problems and chronic conditions.

Millesimal (M): It represents the ratio of 1 part of substance to 1000 parts dilution (Designated with M after the remedy name). M potencies are considered high potencies and are often used by homeopathic physicians for constitutional treatment.

Dose:

- There should be no confusion between the dose and potency. A dose can be 3 tablets / 3 pellets / 10 drops / 3 oral sprays irrespective of potency and is generally the same and does not depend on the weight of the person or animal unlike conventional system of medicine.
- A dose is the amount consumed by the patient at one time (whether you take 3 pellets, 20 pellets or one bottle).
- Aggravation of symptoms in homeopathy is considered as strong response to a remedy, not a side effect.

Various clinical studies have supported the effectiveness of homeopathic therapy. Eighty one out of 107 controlled clinical trials performed from 1966 to 1990, showed the benefits of homeopathic medicine in various ailments such as headache, respiratory infections, diseases of digestive system, ankle sprains, postoperative infections and symptoms and other health-related disorders. (4)

In 1980, a double blind controlled study on patients suffering from rheumatoid arthritis, homeopathic medicine showed improved results as compared to control. Further, a study conducted on Oscilloccinum in 1985 reported 66% improvement in results as compared to placebo. Also, Jacobs J. confirmed the effectiveness of homeopathic medicine in a

study conducted on children suffering from acute diarrhea. As the recovery time for children receiving homeopathic therapy was 20% faster than the dose compared to placebo. Homeopathy system of medicine is a cheap and non-toxic system used by many people globally. It has been found to be very effective in treatment of chronic diseases

that do not respond to conventional therapy and is also an excellent self-care approach for general ailments such as common cold and flu. Since its recognition as a system of medicine, homeopathy has been effective against diseases for which conventional therapy is not successful. (4, 8)

Homeopathic Medicine vs. Conventional Medicine

Properties	Homeopathic treatment	Conventional treatment
Illness	Individual expression of imbalance in normal body physiology	Occurs in well-defined groups based on pathology
Symptoms	Evidence of disharmony and the person's attempt to restore order	Successful treatment makes them go away
Diagnosis	Understanding the phenomenon of illness The whole person is taken into account	The search for the structural cause
Treatment	Individualized and based on the entire expression of symptoms	Based on the pathologic diagnosis
	Based on like cures like and potentized micro doses of medicines	Based on opposing and suppressing symptoms, and high doses of medicine

Controversy on Homeopathic principles or Homeopathic dilemma

The major criticism against the acceptance of homeopathy comes from its principle of infinitesimal dose. It is difficult to explain the ultra-molecular dilutions of homeopathic medicines in terms of basic conventional principles of pharmacology, biochemistry and physics which further creates doubt whether homeopathic system medicine actually has clinical effects or not. Different views regarding their clinical effects are being suggested.

- Whether homeopathic medicines have a specific form of energy or biophysical activity which cannot be calculated by the existing techniques.
- Whether vigorous shaking of drug with the solvent (water, alcohol) produces an entirely new molecule having some biological activity.

Hence, many serious questions regarding the clinical effects and/or knowledge about homeopathic system of medicine have been raised which are needed to be addressed. If the vast field of homeopathic therapy is continuously being ignored then we are choosing to close the door of an efficient system of medicine.

Thus, homeopathy needs to be given proper attention. (8)

Homeopathy versus Placebo

Although there are different opinion regarding the mode of transmission, physicist as pharmacologist seems to be rather considerate regarding the possible involvement of isotropic stereodiversity, lattice formation or lucidity within water molecule as the means of transmission, whereas there is a different section of people who believes the involvement of electromagnetic changes. According to David Reilly if we compare homeopathy and placebo, we find homeopathy playing more than placebo in a mysterious and reliable way. (8, 9)

Cactus grandiflorus

Cactus grandiflorus is a green stemmed climber herb, indigenously found in Jamaica and West Indies. It is widely cultivated as an ornamental plant and is occasionally seen in nurseries in hotter regions of the world and also grows well as an indoor plant. It is commonly known as Night blooming cereus, Queen of the night, Large-flowered cactus, Sweet-scented cactus, Vanilla cactus or Torch thistle. The

original species is rarely cultivated. In 1753, first cultivated species of the herb was described by Linnaeus, but as per the records from Hortus Kewensis, it was known to be grown at Royal Gardens at Hampton Court before 1700. Various subspecies include *Cactus grandiflorus donkelaarii*, *Cactus grandiflorus hondurensis* and *Cactus grandiflorus lautneri*.

Cactus grandiflorus is being used by the natives of Jamaica for various ailments like fever, difficulty in breathing etc. The first record of use of this herb for treating heart disorder is by German physician Dr. Scheere. After that, Dr. R. Rubini, a homoeopathic physician from Naples, revived this drug to be used as a heart remedy. (10, 11)

Common names (12)

Language	Common Name
Danish	Nattens Dronning
Dutch	Koningin van de Nacht
English	Queen of the Night, Night-blooming Cereus, Large-flowering Cactus, Sweet-scented Cactus, Vanilla Cactus, Large Blooming Cereus, Large flowered torch thistle, Large-flowered Night Cactus
French	Reine de la nuit, Princesse de la nuit, Cierge a grande fleurs, Vierge a grandes fleurs, Cierge rampant à grandes fleurs, Fleur d'amour
German	Königin der Nacht, Schlangencereus, Schlangenkaktus
Italian	Cacto grandifloro, Regina della notte
Japanese	Gekka Bijin (Beautiful woman under the moon)
Portuguese	Flor-de-baile, Cardeiro trepador
Română	Antilele Olandeze
Spanish	Reina de las Flores, Reina Gigante, Cardon, Gigante, Organillo, Reina de la noche
Swedish	Nattens Drottning
Tamil	Brahma Kamalam

Constituents:

The green stem and flowers of *Cactus grandiflorus* are the chief source of active constituents such as betacyanins and flavonolglycosides. The flavonolglycosides consist of 1.5% narcissin (lycorine 0.05%), cacticin (0.02%), rutoside (rutin or quercetin-3-rutinoside), hyperoside (quercetin-3-β-D-galactopyranoside), kaempferitrin (kaempferol-3, 7-O-dirhamnoside) and grandiflorine. Various biogenic amines like tyramine (0.3%), N-methyl tyramine and N, N-dimethyltyramine (hordenine) etc., mucus, fat and waxes have also been found in the stems. (10, 13)

Parts used: According to the German Pharmacopoeia, ethanolic extract of fresh young succulent stems and flowers are taken to prepare the mother tinctures of *Cactus grandiflorus*. (14, 18)

Collection: The young stems and flowers of the herb should be collected in the month of July. Protective effect of *Cactus* is due to its resinous substance which is soluble in

alcohol. Since it is unstable, it requires baffle analysis or separation by slow evaporation process. This extract loses its activity quickly so tincture of fresh *Cactus* should be used. *Cactus bonaplandi* is closely related to *Cactus grandiflorus* but the physicians prefer *Cactus bonaplandi* for convulsive heart disorder while *Cactus grandiflorus* in constrictive pain. (15)

Growing Needs: *Cactus* herb is very sensitive to frost. The soils need to be damp and well drained. It is cultivated easily and is a rapidly growing epiphyte or lithophytes, which needs plenty of humus and moisture in summer. It should not be kept under 5°C in winter. It shows optimal growth in full sunlight. Extra light stimulates budding of *Cactus* herb in the early spring season while flowering occur in late spring or early summer which opens between 7 and 8 pm. (10)

Blooming Habits: 6 to 10 inches long white flowers with yellowish outside segment, and having a spherical tuberculate ovary, covered with 0.4 inch long silky spines (1 cm) and yellowish hairs. It is a matter of interest

that it opens after sunset and decays next morning. It has sweet aroma hence used in perfumery. The edible fruit is light yellow with a reddish tinge, 2-3 inches long. (10, 15)

Mechanism of action:

Although the pharmacodynamic properties of herb are known, the possible mechanism of action still remains unclear. It causes elevation in arteriolar tension by increase in muscular energy of the myocardium thus causing arteriolar contraction. But it is yet to be confirmed, by clinical data analysis. Initial research involving the commercial preparations of active compound reported it to be physiologically inert. However, in recent studies, hordenine showed a positive inotropic effect in the myocardium of rats and dogs with increase in systolic and diastolic pressure and peripheral blood flow volume. Different derivatives of flavonoids (rutin, rutinose and kaempferitin) are thought to reduce abnormal leakage thus improving capillary function. This herb is valuable than other drugs of its category because:-

- Myocardial blood vessels and muscular tissue respond with this herb as compared to other drugs.
- *Cactus grandiflorus* also effectively minimizes nervous symptoms in functional heart disorder in relatively small doses. (10, 11)

The antihypertensive and antiarrhythmic activity of the herb is due to flavonoglycosides, mainly found in stem and flower extract. The flavones affect myocardial calcium metabolism thus enhancing its contractile power and promoting normal rhythm. These flavonoids have shown to repair the connective tissues of endothelial lining present in the myocardium, blood and lymph vessels. They also show free radical properties thus reducing oxidative stress. (10, 15, 16)

Specific information regarding pharmacokinetics of *Cactus grandiflorus* is not available and data on individual constituents is also inadequate. The LD₅₀ of narcissin (lycorine), was reported to be

10700 mg/kg (orally) and 145mg/kg (subcutaneously) in mice.

No studies regarding the toxic effects of *Cactus grandiflorus* or its constituents on reproductive system including teratogenicity have been reported. Also, specific data regarding their mutagenic potential is also lacking. (13, 17)

Various researchers have focused on quercetin which have shown antimutagenic and anticarcinogenic activity in different studies. Also, there is no published data on the genotoxic effects of flavonoids or other constituents present in *Cactus grandiflorus*. Also, no immunotoxicity data have been reported. Hordenine and tyramine have been reported to be used as folk medicine to cleanse skin and used for their antibacterial activity which is believed to be due to their phenolic functional group.

It is reported that dermal contact of the fresh juice of *Cactus grandiflorus* in human may cause skin irritations with pruritis and pustules. Oral intake of the herb juice may cause burning sensation associated with nausea and vomiting, however it is not yet reported. (18)

Advantage over other homeopathic cardiotoxics: It does not cause irritation to the heart muscles like *Strophanthus* or gastric irritation like *Digitalis*. It acts on circular muscle fibers of myocardium. It also does not cause muscle paralysis of heart like *Aconite* at large doses. (14, 16)

Dose: (19)

Liquid Extract = 0.6 ml or less, up to 10 times daily

Tincture = 0.12 ml to 2 ml, twice or three times a day

Liquid Extract = 0.05-0.5 ml

Tincture = 0.1-2 ml

Other Recommended Dosage

Adult = 15-20 drops, 3 times per day directly or in liquid

20-30 drops three times daily.

For sudden unexpected symptoms 40 drops or as prescribed by physician

30-40 drops, 2 or 3 times per day.

Children = 7-10 drops, 3 times per day

Indications: Mainly in cardiovascular problem when a person feels a cord or tightness around the chest causing shortness of breath and uncomfort. (10, 17, 20)

Other Indications: (21)

Central Nervous System:

In case of gloomy state of mind, heaviness on vertex, pulsating pain on right side, headache and fear of apoplexy.

Respiratory System:

Suffocation, chest constriction, breathlessness, pain on diaphragm, palpitation, pain on the left arm radiating downward, nose bleeding, obstruction in esophagus, tongue dryness giving the burning sensation, difficulty in passing down the food and throbbing sensation of carotids in angina pectoris.

Gastrointestinal System:

In the feeling of heaviness in stomach with constriction and pulsation, early morning diarrhea, dark stools, blood vomiting, heaviness of anus with painful swollen hemorrhoids.

Genitourinary System:

Problem in urinary bladder like feeling of constriction in the neck of urinary bladder leading to retention of urine, bleeding from the bladder, blood clots in urethra, frequent urination, uterine and ovary constriction, dysmenorrheal, pain in uterus and ovary, pitch dark early menses and vaginismus.

Side effects:

No reported side effects so far at the therapeutic dose of *Cactus grandiflorus*.

Important Considerations:

- Not to be used during first trimester of pregnancy or during breast feeding.
- If patient is on cardiovascular drug should not take this drug without prior consultation with the physician.
- Should not ignore the symptoms of increased pulse or blood pressure changes or the sign of palpitation.

Drug Interaction:

The action of digitalis and other cardiac glycosides have been reported to get potentiated by cactus. It is said to interact with monoamine oxidase inhibitors because of its tyramine content. There is also report of its potentiation by beta blockers, ACE inhibitors, calcium channel blockers and antiarrhythmics. (14, 15)

CONCLUSION

This review reveals that cactus is a potential drug which can be used in different indications. In spite of having similarity with digitalis, it is still not replaced digitalis for heart treatment. The experts recommend the use of this drug with careful observation and with proper medical advice. However this drug is a least explored drug pharmacokinetically and pharmacodynamically. Hence, this is a very promising drug for research purpose and scientific validation.

REFERENCES

1. Swayne J. Truth, proof and evidence: homeopathy and the medical paradigm. *Homeopathy* 2008; 97 (2): 89-95.
2. Frishman W H, Sinatra S T, and Moizuddin M. The Use of Herbs for Treating Cardiovascular Disease. *Seminars in Integrative Medicine* 2004; 2 (1): 23-35.
3. Frye J C. Herbal and Homeopathic Medicine: Understanding the Difference. *Seminars in Integrative Medicine* 2003; 1 (3): 158-166.
4. Goldberg B Healing with Homeopathy; Excerpt from *Alternative Medicine: The definitive Guide*, Copyright 1994, Future Medicine Publishing.
5. Valli G, Giardina E V. Benefits, Adverse Effects and Drug Interactions of Herbal Therapies with Cardiovascular Effects. *Journal of American College of Cardiology* 2002; 39 (7): 1083-1095.
6. Messina B A M. Herbal Supplements: Facts and Myth- Taking to Your Patients about Herbal Supplement. *Journal of Perianesthesia Nursing* 2006; 21(4): 268-278.

7. Fugh- Berman A. Herb-drug interactions. *Lancet* 2000; 355 (9198): 134-138.
8. Ernst E. Is homeopathy a clinically valuable approach? *Trends in Pharmacological Sciences* 2005; 26 (11): 547-548.
9. Linde K, Clausius N, Ramirez G, et al. Are the Clinical Effects of Homeopathy Placebo Effects? A meta-analysis of placebo-controlled trials. *Lancet* 1997; 350 (9081): 834-843.
10. Burt WM. H., *Physiological Materia Medica*, 3rd edition, B. Jain Publishers (P) Ltd. ISBN: 81-7021-361-4, 2003; pp 228-229.
11. Jones A O. *Cactus Grandiflorus in Some Forms of Heart Disease*. *The British Medical Journal*. 1890; 1(1515): 70-71.
12. http://en.wikipedia.org/wiki/Selenicereus_grandiflorus (accessed on 09-03-2015).
13. http://www.ema.europa.eu/docs/en_GB/document_library/Maximum_Residue_Limits_-_Report/2009/11/WC500015853.pdf (accessed on 09-03-2015).
14. Holland L. *Cardiovascular Medicines*. *British Homeopathic Journal*. 1994; 83(4): 223-229.
15. Yarnell E, Abascal K. *Botanicals for Regulating Heart Rhythms*. *Alternative & Complementary Therapies* 2003; 9 (3): 125-129.
16. Podolsky E., *Cactus as a Heart Remedy*. *The Eclectic Medical Journal* 1996; 2: 20-21.
17. Hering C. *Guiding Symptoms of Our Materia Medica*. B. Jain Publishers 2005; 3: 68-90.
18. <http://www.webmd.com/vitamins-supplements/ingredientmono-711-cereus.aspx?activeingredientid=711&activeingredientname=cereus> (accessed on 09-03-2015)
19. Anon *British Pharmaceutical Codex* 1934. Pharmaceutical Press London UK, 1934.
20. Mashour NH, Lin GI, Frishman WH., *Herbal medicine for the treatment of cardiovascular disease: clinical considerations*. *Arch Intern Med*. 1998, 158 (20): 2225-2234.
21. William Boreick, *Boreick's Materia Medica Excerpt*. *The Tincture* 9th edition pp. 174-176.