

PHARMACOLOGICAL ASPECTS OF LASUNA-AN OVERVIEW

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ABSTRACT

Garlic is probably one of the earliest known medicinal plants, which used from ancient time to cure different disease conditions in human. Garlic's principal medicinal uses are to lower blood pressure and cholesterol, fight infections, and prevent cancer. The active constituents are sulfur-containing compounds that are rapidly absorbed and metabolized. Numerous studies suggest that garlic lowers total cholesterol concentrations by approximately 10%, favorably altering HDL/LDL ratios. Literature survey support garlic's effectiveness as a mild antihypertensive, lowering blood pressure by 5-7%. Garlic inhibits platelet aggregation and enhances fibrinolytic activity, reducing clots on damaged endothelium. Another important use of garlic is as antidiabetic. Garlic controls the blood sugar level by different types of mechanisms. *In vitro* studies and animal data suggest that garlic may help to prevent some solid tumors. Therefore garlic is also effective in the cancer prevention. There are no studies evaluating its effectiveness in treating children or pregnant or nursing women. The main aim of this article is highlighting the pharmacological action of *lasuna* in different diseases. *Lasuna* is cost effective and easily available drug and had more medicinal values that's why I selected this topic. The other proposed uses of garlic include the hepatoprotective, antihelmentics, anti-inflammatory, antioxidant, antifungal and wound healing.

Keywords: *Lasuna* , Pharmacological action, overview.

INTRODUCTION

Garlic, *Allium sativum L.* is a member of the Alliaceae family. It has been widely recognized as a valuable spice and a popular remedy for various ailments. Cultivated practically and it was used as an antiseptic to prevent gangrene during World War I and World War II. Garlic's current principal medicinal uses are to prevent and treat cardiovascular disease by lowering blood pressure and cholesterol, as an antimicrobial, and as a preventive agent for cancer. The active constituents are several complex sulfur-containing compounds that are rapidly ab-

sorbed, transformed and metabolized. Pooled data from numerous randomized trials suggest that garlic lowers total cholesterol concentrations by approximately 10% and favorably alters HDL/LDL ratios. *In vitro* data suggest antibacterial effects, but these have not been evaluated in controlled trials in humans.¹

MATERIALS AND METHODS

Garlic contains at least 33 sulfur compounds, several enzymes, 17 amino acids, and minerals such as selenium. It contains a higher

concentration of sulfur compounds than any other *Allium* species. The sulfur compounds are responsible both for garlic's pungent odor and many of its medicinal effects. Dried, powdered garlic contains approximately 1% *alliin* (S-allyl cysteine sulfoxide).

One of the most biologically active compounds, *allicin* (diallyl thiosulfinate or diallyl disulfide) does not exist in garlic until it is crushed or cut; injury to the garlic bulb activates the enzyme *allinase*, which metabolizes *alliin* to *allicin*. *Allicin* is further metabolized to *vinylthiines*. This breakdown occurs within hours at room temperature and within minutes during cooking.²

DISCUSSION

Antihypertensive Potential

Garlic (*Allium sativum*) has played an important dietary as well as medicinal role in human history.

Blood pressure reducing properties of garlic have been linked to its hydrogen sulphide production and *allicin* content – liberated from *alliin* and the enzyme *allinase* which has *angiotensin II* inhibiting and *vasodilating* effects, as shown in animal and human cell studies.³

Wound Healing Potential

Study was done on the chicken dorsum skin excision wound assay to investigate the influence of different concentrations of aged garlic solution (AGS) on wound healing. Gross, histopathology, scanning electron microscopy (SEM) and computer-based three-dimensional (3D) image-probing techniques were utilized to determine the effects of AGS on wound closure, re-epithelialization, dermal matrix regeneration, and angiogenesis.⁴

Anti diabetic Potential

Diabetes is a metabolic disturbance that gradually affects the function of various systems in the body. Poorly controlled blood glucose is

believed to be the most important factor in the development of diabetic complications in both type 1 and type 2 diabetes. Based on report of WHO, garlic can be used for helping treatment of hyperglycemia. According to a report by Ryan et al. (2001), one-third of diabetic patients take alternative medications that they consider efficacious, of which garlic is the most commonly used. Garlic and garlic constituents prepared by various means have been shown to have antidiabetic actions. In diabetic patients, it was reported that garlic oil can correct hyperglycemia. In addition, a precursor of various allyl sulfide constituents of garlic oil, S-allylcysteine sulfoxide (*alliin*), was shown to have a hypoglycemic effect similar to that of *glibenclamide*. Garlic has been found to be effective in lowering serum glucose levels in STZ-induced as well as *alloxan*-induced diabetic rats and mice. Most of the studies showed that garlic can reduce blood glucose levels in diabetic mice, rats and rabbits. It is not clear how garlic actually works in alleviating hyperglycaemia. The hypoglycaemic action of garlic could possibly be due to an increase in pancreatic secretion of insulin from β -cells, release of bound insulin or enhancement of insulin sensitivity. It has been previously suggested that garlic (*allicin*) can enhance serum insulin by effectively combining with compounds like *cysteine*, which would spare insulin from SH group reactions which are a common cause of insulin inactivation. Another mechanism proposed by researcher states that the antioxidant effect of S-allyl cysteine sulfoxide, an isolated product from garlic, may contribute to its beneficial effect in diabetes. Research postulate garlic may act as an antidiabetic agent by increasing either the pancreatic secretion of insulin from the β -cells or release of bound insulin⁵

Anticancer Potential

The chemopreventive activity has been attributed to the presence of organosulfur compounds in garlic. The exact mode of action was not fully understood, but several modes of action have been proposed. These include its effect on drug metabolizing enzymes, antioxidant properties and tumor growth inhibition. Most of these studies were carried out in the animal models.⁶

Antiatherosclerosis and Hypolipidemic Potential

Thus, garlic produces both antiatherosclerotic (therapeutic) and antiatherogenic (preventive) effects on experimental atherosclerosis. Garlic's antiatherosclerotic activity is probably due to its direct effect on the processes occurring in the vascular wall as it does not depend on blood cholesterol lowering. The direct antiatherosclerotic effect of garlic can be explained by its action at the level of arterial cells.

The mechanisms of garlic's direct effect on intracellular lipids can be explained by its ability to suppress lipid synthesis as garlic powder extract inhibits biosynthesis of cholesteryl esters and triglycerides in atherosclerotic cells.⁷

Antimicrobial Potential

Antifungal Potential

High dilutions of extracts of *Allium sativum*, or garlic, have been shown to possess fungistatic and fungicidal activity in vitro and in vivo. In the People's commercial *A. sativum* extracts are widely used to treat patients with systemic fungal infections. In support of the use of *A. sativum* to treat cryptococcal meningitis, it shows good results. *Allium sativum*, had the best activity against the three *Candida albicans*. The antifungal activity of six fractions derived from garlic was investigated in an in vitro system. Ajoene had the strongest activity in these fractions⁸

Immunomodulatory Potential

Allium sativum an important medicinal plant having immunomodulatory effects. Three proteins showing immunomodulatory were separated from garlic by Q-Sepharose chromatography of 30 kD ultra filtrate of raw garlic extract. All these proteins exhibit the mitogenic activity towards human peripheral blood lymphocytes, murine splenocytes and thymocytes.

First reported the augmentation of tumor immunity by garlic; subsequently a variety of immunostimulatory effects of garlic were reported.⁹

Antioxidant Potential

In vivo antioxidant effects of several organosulfur compounds derived from garlic have been studied. In one study, two lipophilic organosulfur compounds, diallyl sulfide (DAS) and diallyl disulfide (DADS) and two hydrophilic organosulfur compounds, s-ethyl cysteine (SEC) and n-acetyl cysteine (NAC), protected against lipid-related oxidations by activating associated antioxidant enzymes.¹⁰

Antiinflammatory Potential

Several compounds isolated from *Allium sativum* (garlic) modulate leukocyte cell proliferation and cytokine production.¹¹

Anthelmintic Potential

The alcoholic extract of bulb of *A. sativum* has also shown moderate *in vitro* anthelmintic activity against human *Ascaris lumbricoides*. *A. sativum* has been reported to be effective in the exposure of dysentery and also act as vermifuge. Oil of *A. sativum* has also been reported to possess anthelmintic activity and discards all injurious parasites in the intestine. Garlic is the best known source of selenium. The sulfur compound allicin, produced by crushing or chewing fresh garlic, in turn produces other sulfur compounds:¹²

Anticoagulant and Fibrinolytic Potential

The usefulness of garlic in preventing disease of cardiovascular system is widely recognized.

There are several report on anticoagulant. Song et al (1960) have isolated blood anticoagulant substance from garlic and studied its physical and chemical properties. A half mg of garlic extract completely inhibited one ml of blood from coagulating. The inhibiting effect of garlic extract on blood clotting was almost the same as that of potassium oxalate.

Hepatoprotective Potential

Oral administration of raw garlic protects tissue damage by increasing the antioxidant status against oxidative stress. Hence, garlic plays a promising role in antioxidant and it can be considered as a potent drug for the treatment of alcoholic disorders.

Administration of lead showed significant increase in plasma ALT and ALP activities, and conversely decrease plasma AST activity level. Post-lead treatment with *A. sativum* significantly reduced the activities of ALT and ALP, and increased the activity of AST when compared to the rats treated with lead alone.¹³

CONCLUSION

A single clove of garlic has the potential of curing a man from a large number of diseases by inhibiting the population of different strains of bacteria and fungi. Garlic (*Allium sativum*) use in cardiovascular therapeutics has an even longer history back over 3000 years to ancient time. Numerous animal studies have shown garlic to have a cholesterol lowering effect. The active chemical in garlic is allicin, which is produced when raw garlic is crushed, allowing the enzyme alliinase to act on the stable precursor allin. Garlic's antidiabetic, antibiotic and perhaps anticancer effects are well-accepted world over because of the many of scientific literature supporting these effects. Garlic also has hepatoprotective, antioxidant, and antihelmentic effect. The other pharmacological effect which required more attention of

researcher includes the anticoagulant, anti-inflammatory, immunomodulatory and wound healing action of garlic.

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