REVIEW ON GARLIC HEALING PROPERTIES IN TREATMENT OF URINARY TRACT INFECTION

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Abstract: Garlic (Allium sativum) is a fragrant hearb and tuber. It is a popular spice. Garlic products are used as sources of medicine in many ways in human beings day to day life. Garlic has antimicrobial activity against many genera of bacteria, fungi,and viruses. It contains higher sulfur compounds and which are responsible for it's medicinal effects. UTI caused by pathogen bacteria such as staphylococcus aureus, Escherichia coli, Klebsiella pneumonia, pheromones aeruginosa and proteus sp. Garlic shows antimicrobial effects may help to treat UTI infections. Fresh Garlic juice has the potential to reduce growth of E.coli bacteria that causes UTI infection. Garlic has been historically used for its potential medicinal properties, including its purported ability to help with urinary tract infections (UTIs). It contains compounds like allicin, which have antimicrobial properties that may help combat bacteria responsible for UTIs. However, it's important to note that while some studies suggest garlic may have benefits for UTI treatment, more research is needed to confirm its effectiveness. Additionally, garlic should not be used as a sole treatment for UTIs and consulting with a healthcare professional is advised for proper diagnosis and treatment.

Keywords: Garlic (Allium sativum), UTI, Anti-bacterial, Anti viral, Anti-Inflammatory, Antimicrobial.

INTRODUCTION:-

Garlic is obtained from the under root stem of the plant known as Allium sativum belonging to family amaryllidaceae. It is used most commonly in various diseases and physiology disease. Among the material used where volatile oil of medicinal plants likes clove(clove bud) , cardamom (ilachi) , Ajwan (carum copticum) , black paper (maricha), papermint,Ginger. These medicinal plants used for the various purposes for the treatment of diseases or also the preparation for tablets, crems,dental products like mouth washes.Herbal medicinal preparation are more in demand than main stream pharmaceutical products in Japan. Garlic is also used in the treatment of UTI infection. The ureter is the main vital organ for the transport of urine. Peristaltic waves that pass from the renal pelvis to the Urinary bladder vary in frequency from 1-5/min depending on how fast urine being formed . Uterus 25-30cm long and are thick walled narrow tuberculosis that vary in diameter from 1mm to along their course between the renal pelvis and the Urinary bladder with aging the both kidneys get shrink in size , have a reduced blood flow and filter less blood. This age related changes in the kidney size and functions seen to be linked to a progressive reduction in blood supply to the kidneys as an individual get olders for eg. Blood vessels such as the glomerular become damaged or decrease in number. The mass of the two kidneys decrease from an average of nearly 300 gm in 20 yr old to less than 200gm by age 80 yr decrease of about 1/3rd . Renal blood flow and filtration rate decline by 50% b/w age 40 and 70 yrs. By age 80 about 40% of glomeruli are not functioning and thus, filtration, reabsorption, and secretion decrease. Kidney disease that become more common with age include acute and chronic inflammation and renal calculi [Kidney stone] . Because the sensation of thirst diminishes with age, older individuals also are susceptible to dehydration, Urinary bladder changes that occur with aging include the reduction in size and capacity and weaking of the muscle Urinary tract infection are more common among the elderly, as are polyurethane (excessive urine production), nocturia (excessive urination at night),dysuria (painful urination) , hematuria(blood in the urine).

The garlic is widely used medicinal purpose or several disease condition like eg.

- Endometriosis
- Atherosclerosis
- Diabetes mellitus

- Hyperlipidemia
- Periodontitis
- Stomach cancer
- Garlic is used as carminative, aphrodisiac, expectorant, stimulant and disinfectant in the treatment of pulmonary condition.
- It is largely used as condiment.

Garlic Oil is used as anthelmintic and rubefacient.
Allicin is antimicrobial.

- Garlic is useful in high blood pressure and Atherosclerosis.
- Fresh Garlic is prophylactic against amoebic dysentery.
- It has strong anti- oxidant effect.

Figure 1Fig: Garlic (Allium Sativum)

TAXONOMICAL DISTRIBUTION AND BOTANICAL DESCRIPTION:-

- Kingdom: Plantae
- Subkingdom: Trachebionta
- Super division: Spermatophyta
- Class : Monocotaledon
- Subclass: liliidae
- Order: lillales
- Family: Alliaceae
- Genus : Allium Sativum
- Species: sativum

Geographical source:

Garlic is cultivated in Central Asia, southern Europe,USA and India. In India it is found in almost all the states and cultivated as a spice or a condiment crop widely.

Microscopic character:

- ✓ Colour: bulbs are white to pink in colour
- ✓ Odour: characteristic and aromatic
- ✓ Taste: Aromatic and pungent
- ✓ Size: 1.5 to 2.5 cm

CULTIVATION AND COLLECTION:

Garlic is cultivated in well- drained moderately clay loamy soil.It needs cool moist climatic conditions during the growth and dry period during maturity.Garlic is a hardy plant with narrow flat leaves and bears white small flowers and bulbils.The cultivation of drug is done by planting bulbs generally in the Mont of September to in October. It takes about four months for harvesting.It also taken as an alternate crop with many vegetables. For cultivation about 300 kg of bulbs are required per hectare and yield of garlic per Hector is approx. 8000 kg.

Figure 1 Garlic bulb

Figure 2 Garlic plant

Figure 3Harvested garlic left to dry

CHEMICAL CONSTITUENTS OF GARLIC:-

Uses of Garlic

1. Medicinal Uses: In the Indian subcontinent people use fresh leaves of garlic as salad and a good tasty pickle is also prepared

Garlic is a high source of proteins (6.3%), carbohydrates (29%), minerals (0.3%) & essential oils 0.1-0.4 % ,fat, vit. C and sulphur. Ascorbic acid is very high in green garlic.garlic have several medicinal values. It has antibacterial, antifungal, antiviral and anti-protozoal activity.In addition to this garlic have several medicinal values. It is helpful to cardiovascular system & antioxidant and anticancer properties

2. Other uses: Adhesive present in the sticky juice of bulb is used in mending glass and porcelain. A garlic-derived polysulfide Also use as a insecticide. It protects plants against various infections and used as natural pescticide for plants.

Nutritional values of garlic per 100gm :-

	Amount per 100g raw garlic	**% of recommended daily intake**
Calories	14 gram	7%
Carbohydrates	33.1 gram	11%
Fibre	2.1 gram	8%
Protein	6.4 gram	13%
Vitamin B6	1.2 gram	62%
Thiamin	0.2 gram	13%
Riboflavin	0.1 mg	6%
Manganese	1.7 mg	84%
Selenium	14.2 mcg	20%
Calcium	181 mg	18%
Copper	0.3 mg	15%
Phosphorus	153 mg	15%
Potassium	401 mg	11%
Iron	1.7 mg	9%
Vit. C	31.2 mg	52%

URINARY TRACT INFECTION:-

A urinary tract infection is a infection in urinary system it includes urethra ,both kidneys, ureters & bladder. Most causable infection is a lower urinary tract. the bladder and the urethra.Women has the high risk of developing a UTI as compared to men. Infection limited to your bladder can be painful,annoying & irritable. Antibacterial agents are majorly used in the treatment for UTI. Side effects associated with antibiotic and drug resistance a need for an alternative therapy. UTI is a most common disease in all gender type. There are two organs involved in UTI i.e, bladder and urethra.UTI means infection in Urinary system. There are two kinds of UTI one is cystitis and another is urethritis.

a) Lower UTI
b) Upper UTI

CAUSES OF UTI:-

Urine usually free of bacteria, viruses and fungi but does contain fluids, salts and waste products. infection occurs when micro organisms,mostly bacteria from the digestive tract, Most infections arise from one type of bacteria, E.coli which normally found in the colon. E.coli are the organisms most commonly responsible for catheter-associated UTIs. Proteus mirabilis, P.aeruginosa, and Streptococcus faecalis, Staphylococcus aureus, Klebsiella pneumoniae, Mycobacterium tuberculosis, Actinomycetes, Nocardia, Candida etc can cause Urinary Tract Infection.

SYMPTOMS OF UTI:-

- Dysuria (painful urination)
- Suprapubic & low back pain
- Fever
- urgency,
- hesitancy
- polyuria,
- Pus in urine
- Pain during sex
- Soreness
- Cramps
- Nausea
- Vomiting
- Pass very small amount of urine
- Urinary incontinence
- Hematuria
- costovertebral angle pain

SYPTOMS IN CHILDREN :-

- Urge to urinate frequently
- often in small amounts
- Burning with urination
- Cloudy urine
- Strong unpleasant urine smell
- Dark or bloody urine
- Abdominal pain
- Fever
- Vomiting

USES OF GARLIC :-

Antimicrobial Activity:-

Uropathogenic Escherichia coli .it is very infectious in UTI. Uropathogenic condition it is the complicated or uncomplicated in infection condition. UTI is one of the common tract for bacterial infection.UTI is symptomatic infection in include neonates, preschool girls, sexually active women ,elderly women and men.in this days some kids get UTI is again and again this characterized and conducted by recurrent Urinary tract infection. if we are not taking the drugs properly may be the problem carried after taken the antibiotics.

In 1958 antimicrobial properties of garlic were first described by Pasteur, after that many pharmacognosist and scientists had finds its effectiveness and broad-spectrum antimicrobial activity against many species of bacteria, viruses, protozoan, parasites, and fungi. Allicin and other sulfur compounds are thought to be the major compounds responsible for the antimicrobial effect of garlic. Garlic is more effective with the less side effects as compared to other antibiotics as a result, garlic are used as an alternative remedy for the treatment of various infections. Garlic has an antimicrobial property that protects the host from other pathogens. Previously conducted researches confirmed that garlic is not only effective against Gram-negative & Gram-positive bacteria as well as show antifungal & antiviral activities.

Anti-bacterial activity:-

Garlic has been used for centuries in various region to fight infectious disease. Different research show that garlic has been proven to be effective against a gram-negative & gram-positive bacteria. These include Salmonella, E-coli., Staphylococcus aureus, Escherichia coli, Salmonella spp., Bacillus subtulis, Micrococcus spp., Clostridium spp. and Mycobacterium spp. The gram-positive Staphylococcus aureus was more vulnerable to the toxic effects of garlic than its gram-negative . It has been shown that the liquid extract of garlic can be used as conventional antibiotics to fight agents of healthcare- associated infections in hospitals. In vivo & in vitro study of garlic extract was also effective against Streptococcus mutans they are primary etiological organisms in dental caries.

Anti-Inflammatory Activity:-

Garlic extracts show anti-inflammatory effects.one study suggest that garlic treatment significantly attenuated inflammation and hepatic injury induced by Eimeria papillata infections. The anti-inflammatory activity exhibited by garlic oil is mainly through inhibiting the assembly-disassembly processes of the cytoskeleton. Cytokines involved in inflammatory bowel disease (IBD) direct a predominantly cell-mediated T-helper-1 (Th1) immune response. Several compounds isolated from A. sativum modulate leukocyte cell proliferation and cytokine production. To find out the possible therapeutic effects of garlic in the treatment of patients with IBD, whole blood and peripheral blood mononuclear cells (PBMCs) should be assessed. In the presence of various concentrations of garlic extract, in vitro, the effect of garlic extract on leukocyte cytokine production was determined using multiparameter flow cytometry. Accordingly, inflammation associated with IBD can be treated with garlic extract by inhibiting Th1 and inflammatory cytokines while upregulating IL production. An in vivo animal model study needs to be undertaken to determine the significance of these in vitro findings. Other authors have shown the preventive effect and possible toxicity of garlic oil and its organosulfur compounds in endotoxin-induced systemic inflammation and intestinal damage. A lead compound derived from allicin is shown to be a good starting point for the formulation of anti-inflammatory drugs with minimum side effects.

Anti-fungal activity:

Garlic extract showed a broad spectrum fungicidal effect against a wide range of fungii including candida , torulopsis , trichophyton, cryptococous, aspergillus, trichosporon and rhodotourula species garlic enzyme alliance produce allicin daily dithiosulfinate from the alliance has been shown to have wide range antifungal specifity polymyxin B is effective against various yeast and filamentious fungi when used in combination with allicin Hensel combination increases the plasma memberane permeability in saccharo cerevisiae garlic has been shown to inhibit the growth of fungal diseases.

Different dilutions of extracts of A. sativum have been shown to possess fungistatic and antifungal activity in vivo and in vitro. Ajoene is an active compound found in garlic which plays a great role as a topical antifungal agent. Garlic has been shown to inhibit the growth of fungal diseases as equally as the drug ketoconazole, when tested on the fungi Malassezia furfur, Candida albicans, Aspergillus, Cryptococcus and other Candida species. An in vitro study showed both intrinsic antifungal activity of allicin and its synergy with the azoles group of drugs, in the treatment of candidiasis. One study showed that six different mixtures of garlic distilled oils containing DDS and DTS are active against a number of yeasts (C. albicans, C. tropicalis, and Blastoschizomyces capitatus). Another antifungal protein, allivin, was isolated from A. sativum with antifungal activity against Botrytis cinerea, Mycosphaerella arachidicola and Physalospor apiricola. Garlic oil can be used to treat ringworm, skin parasites and warts if it is applied externally. Lesions caused by skin fungi in rabbits and guinea pigs were treated with external applications of garlic extract and starts to heal after 7 days.

Anti viral activity:-

Uropathogenic Escherichia coli. it is very infectious in UTI. Uropathogenic condition it is the complicated or uncomplicated in infection condition. UTI is one of the common tract for bacterial infection. UTI is symptomatic

infection in include neonates, preschool girls, sexually active women ,elderly women and men.in this days some kids get UTI is again and again this characterized and conducted by recurrent Urinary tract infection. if we are not taking the drugs properly may be the problem carried after taken the antibiotics.

ADVERSE/TOXIC EFFECT OF GARLIC:-

Garlic appears to be safe for adults. Side effects include dirty breath and body odor, chest burn, stomach upset, & allergic reactions. These are more common side effects with raw garlic. Garlic can thin the blood as similar to aspirin. Nausea, vomiting and breath odor are major adverse effects especially when raw forms are used.garlic should be taken with great caution in patients taking anticoagulants due to blood thinning activity.study reports showed that a use of high garlic dose induced hepato toxicity.

MARKETED FORMULATIONS OF GARLIC:-

CONCLUSION:-

It's clear that garlic holds significant potential as a natural remedy, especially in the face of increasing bacterial resistance to antibiotics. Its diverse range of benefits, from antibacterial and antifungal properties to antiviral and anti inflammatory activity, make it a valuable resource in medicine. Additionally, efforts to conserve medicinal plants and raise public awareness about their importance are crucial for their sustainability and continued contribution to human and animal health. Urinary tract infections (UTIs) are common, with various factors contributing to their prevalence, like gender differences, pregnancy, age, use of urinary devices, prolonged hospitalization, diabetes, and other physiological and environmental factors. While Garlic are typically used to treat UTIs. This offers a promising alternative for those seeking natural remedies or facing antibiotic resistance issues.use of herbal garlic product for different diseses is increasing now a days and it hase less or zero side effect.it is easily available in india and mostly use in day to day life in Indian people garlic as a spice,food,medicine etc. The garlic show various effects such as anti-inflammatory, anti-bacterial, antiviral, antifungal and antioxidants effect . the various cultures used a garlic for biological and medical effect .In 1944 discovered the most active compound in a garlic.

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