Greener Journal of Epidemiology and Public Health
ISSN: 2354-2381
Vol. 12(1), pp. 16-20, 2024

https://gjournals.org/GJEPH
DOI: https://doi.org/10.15580/gjeph.2024.1.112924183

Ameliorative Effects of Garlic Clove (*Alium sativum*) on Tooth Ache and its Causative Organisms

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ARTICLE INFO

Article No.: *112924183*
***Type*:** *Research*
Full Text: *PDF, PHP, HTML, EPUB, MP3*
DOI: *10.15580/gjeph.2024.1.112924183*

Accepted: *02/12/2024*
Published: *19/12/2024*

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Keywords: *Garlic Clove, toothache organisms, analgesic, pain, Allicin*

ABSTRACT

This study investigated the ameliorative effects of garlic clove (*Allium sativum*) on toothaches and its causative organisms Twenty Four Female subjects were selected for this study. They were divided in four (4) groups viz Group A (6) served as control, while groups B,C and D were the groups that used garlic clove (Group B), garlic clove plus ibuprofen (Group C) and Ibuprofen only (Group D). The treatment lasted for five (5) days.

Result from the study showed that Group B subjects received more effective relieve from pain and aches when examined than those other groups in Groups A,C and D.

The reduction in pain and aches could be attributed to the presence of flavenoids and Allicin in Garlic which are known to be antimicrobial, antifungal, anti-inflammatory and pain killer.

The study suggests that garlic clove is very effective in ameliorating toothache.

INTRODUCTION

Every living thing including man requires a healthy state to survive the environment where he finds himself. Sometimes a disease can emanate from accidents, blows, eating of unhealthy food, chewing of bone, hard materials and drinks. Most food and drinks we take are through the mouth and the teeth is involved in grinding some of the food.

Toothache is a common dental problem that affects people of all ages. It is characterized by pain or discomfort in the teeth, jaws and gums. The intensity of the pain range from mild to severe and can be caused by various factors. It is one of the most excruciating pains that can make anyone's life miserable.

Symptoms and signs

Fever, general pain that lasts more than one or two days, swelling, pain when you bite, abnormally red gums and foul-tasting, discharge or pus.

Causes of Tooth ache

Dental decay: This is due to the irreversible solubilization of tooth mineral by acid produced by certain bacteria that adhere to the tooth surface in bacterial communities known as dental plaque (DZink et al, 1988)

Etiology

Streptococcus mutans is the main cause of dental decay. Various lactobacilli are associated with progression of the lesion.

Abscess: It is a tooth infection that can occur if a cavity goes untreated.

Teeth grinding (Bruxism): It is the grinding or clenching of teeth. This can result to pain

Periodontal disease: This can establish itself when the gums detach from the teeth as a result of an inflammatory response to plaque (Lamster, 1992).

Etiology: Periodental infections are usually mixed most often involving anaerobes such as Treponema denticola and porphyromonas

Gingivalis: There is no apparent pain until very late when abscesses may occur. Bleeding gums and bad breath may occur.

Many approaches to treating toothache abound but Garlic cloves have been suggested to alleviate tooth ache hence the study on the ameliorative effect of Garlic Clove on toothache and its causative organisms. Garlic is a plant in the Allium (Onion) family. It is closely related to onions, shallots and leeks. Each segment of a garlic bulb is called a Clove. It is a specie of bulbous flowering plant in the genus Allium. It is also a perennial flowering plant that grows from a bulb that contains outer layers of thin, whitish sheaths or skin that enclose various lobes known as cloves. Garlic is characterized by elongated narrow flat and linear gray green leaves that are longitudinally folded and have a keel on their lower surface

Medicinal uses of Garlic

Most of Garlic's health benefits are due to the formation of sulfur compounds when one crush or chew a garlic clove. The sulfur compounds enter one's body from the digestive tract and travel all over the body exerting strong biological effects.

Garlic inhibits and destroys bacteria, fungus and parasites hence its efficacy in the treatment of tooth aches and infections as well as lowers blood pressure, cholesterol and sugar levels, preventing blood clotting and protecting the liver.

Phytochemical contents of Garlic

Garlic is a plant-based food which is known to have strong natural anti biotic with a wide spectrum phytochemical content that acts as antibacterial. This includes essential oil, allicin, ajoene and flavenoids, several organosulfur compounds, N-acetylcysteine, (NAC), s-allyl-cysteine (sAtc) and S-ally- mercapto cysterine. Despite its high medicinal and culinary value, garlic contains some anti nutritional factors such as flavonoids, saponins, tannin, alkaloids, steroids, phenolic acids, carbohydrates, reducing sugars lipids, ketones, phenols and cardiac glycosides.

MATERIALS AND METHODS

Subjects:

24 female subjects living in Enugu metropolis known to be attending crown dental center and other centres for toothache problems were selected for this study

Experimental Design

The 24 female subjects suffering toothaches were divided into four (4) groups Viz Group A, B, C and D consisting of 6 subjects in each group. Group A, the control, group B received Garlic clove paste only, Group C received Garlic Clove paste and ibuprofen tabs while group D received only Ibuprofen tabs. All the treatment lasted for 5 days.

Preparation of Garlic clove paste

Fresh Garlic cloves were collected from botanical garden and identified by a taxonomist. They were washed, weighed, cut and pulverized to fine powder. They were stored in clean universal containers (Oguwike et al, 2011)

Phytochemical Analysis of Garlic

Aqueos preparation of garlic clove was screed for the presence or absence of various secondary metabolites using standard phytochemical screening procedures as described by Harbourne (1973), Trease and Evans (1996). The extract was tested for resins, calcium, alkaloids, flavenoids, reducing sugars, saponins, glycosides, carbohydrates, steroids, acidic compounds, fats, and oil

Toxicity study

The LD_{50} of extract in albino rats was determined using Lorke's method (1983). The procedure of determining the lethal dose is by increasing the concentration of the extracts administered to the rats (Per body weight) in each group consisting of eight (8) rats per groups for five (5) days. The concentration used are 500mg/kg, 1000mg/kg, 200mg/kg, 3,000mg/kg, 4,000mg/kg, 5000mg/kg, 6000mg/kg and 7,000mg/kg per body weight respectively. The mortality rate was determined and a graph plotted to determine the LD_{50}.

Study on effectiveness of Garlic clove and ibuprofen (Pain reliever) on toothache subjects;

The study on effectiveness of Garlic clove on toothache compared to allopathic remedy (ibuprofen) was carried out using 24 female subjects grouped into four (4) Group A is the Control Group and received only normal saline, Group B subjects received garlic clove paste only, Group C subjects received garlic clove paste and Ibuprofen tabs while group D subjects received only ibuprofen tabs.

The subjects were asked to place the garlic clove paste on the troubled teeth while ibuprofen tabs were swallowed daily for a period of 5 days. The control groups gargled their mouth with normal saline.

The subjects in the groups were examined and their reports were noted

RESULTS

The results obtained from this study are shown in tables 1 &@ and figure 1.

Table 1: The phytochemcial analysis of *Allium sativium* (Garlic)

Substances	Alkaloids	Flavenoids	Glycosides Tannins	Saponins	Calcium	Reducing sugar	Carbohydrntes	Resins, steroid, terpenoid
Degree of concentration	+	+++	++	+++	+	+	+	—

- Negative (absent)
+ present in small concentration n
++ present in moderate high concentration
+++ present in very high concentration

Table 2: study on the effectiveness of garlic clove and ibuprofen on tooth ache subjects for 5 days

Paste	Dose of paste 58/kg	Observation	Significance
Group A Control n=6 (placebo) 5 days	___	___	Non
Group B n=6 (Garlic only) 5 days	58/kg	+++	Very effective
Group C n=6 (Garlic + ibuprofen) 5 days	58/kg	++	Moderately effective
Group D n=6 (Ibuprofen only) 5 days	58/kg	+	Less effective

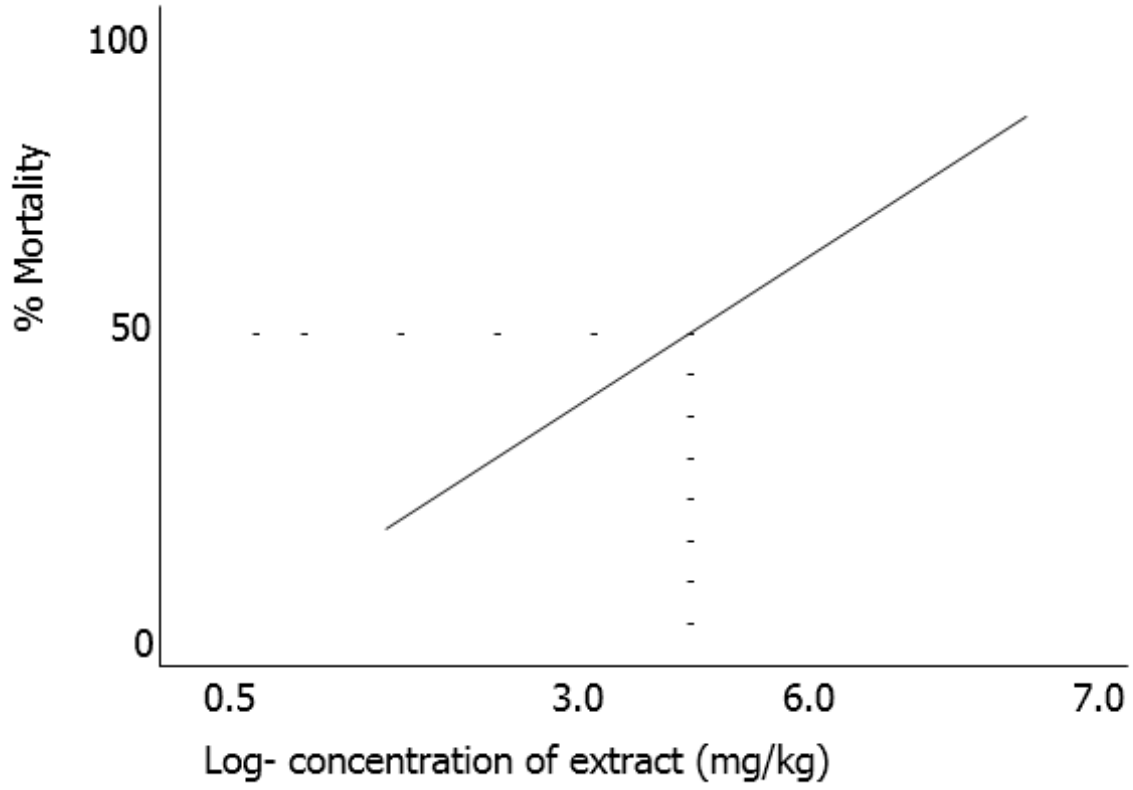

Figure 1: Mortality study showing the effects of administering graded doses (500-7000 mg/kg) in the rats of garlic cloves against the percentage mortalities. LD_{50} is 4000mg/kg body weight

DISCUSSION

Local medicinal herbs have been employed in the management of various diseases and their protective effect on the body from damage due to free radicals and lipid peroxidation has been reported (Pau-ling 2002). The ameliorative effect of garlic clove (Allium sativa) on toothache and causative organisms has been studied.

Garlic Cloves have been used as a traditional medicine for centuries due to their natural analgesic antibacterial and antifungi properties

The phytochemical analysis of garlic (Table 1) indicates that it contains large quantity of flavenoids. Flavenoids are secondary metabolites present in many plants, fruits, vegetables and leaves with potential applications in medicinal chemistry. It possess a number

of medicinal benefits including anticancer, antioxidant, anti-inflammatory and antiviral properties. They also have neuroprotective and cardio-protective effects.

The presence of bioactive phytochemical constituents present in these different plant parts gives them their medicinal value and biological activities (Thilakarathna et al, 2013).

Saponins is another phytochemical element present in Garlic. Saponins are naturally occurring compounds that are widely distributed in all cells of legume plants. Saponins effect the immune system in ways that help to protect the human body against cancers and also lower cholesterol levels, saponins decrease blood lipids, lower cancer risks and lower blood glucose response. A high saponin diet can be used in the inhibition of dental carriers (John et al 2004) and platelet aggregation.

The lethal dose of garlic in this research is 4000mg/kg in rats (figure 1). The dose used in this research for the subjects 5g/kg is very safe. The study on the effectiveness of garlic clove compared with ibuprofen (pain relieve) table 2 showed that group B subjects who used only garlic clove to treat toothache was more effective. Allicin is known to be present in garlic. It is an unstable compound that is only briefly present in fresh garlic after it is cut or crushed. It is naturally analgesic. Allicin has antibacterial and antimicrobial properties that can help kill some of the bacteria associated with toothaches. Hence it is able to reduce toothache very well unlike ibuprofen which is a pain killer but does not rid off bacteria and other microbes that can remultiply again in the tooth and continue to cause pain.

Preventing toothache is better than having to deal with the pain and discomfort.

One should always maintain a consistent oral hygiene by brushing teeth at least twice a day with fluoride toothpaste and use dental floss or itnerdental cleaners to clean between the teeth daily. Proper oral hygiene helps remove plaque and prevent tooth decay. Again smoking and using tobacco products increase the risk of gum disease and tooth decay. Quitting or avoiding tobacco can significantly improve oral health.

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Cite this Article: Ebede, SO; Emenuga, VN; Okonkwo, OB; Igwedibia, CP; Onwosi-Ejeh, FC; Okeke, BC; Oguwike, FN (2024). Ameliorative Effects of Garlic Clove (*Alium sativum*) on Tooth Ache and its Causative Organisms. *Greener Journal of Epidemiology and Public Health*, 12(1): 16-20, https://doi.org/10.15580/gjeph.2024.1.112924183,