

Efficacy of Garlic oil in Treatment of Active Chronic Suppurative Otitis Media

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(%)
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Abstract:

This is a double-blind prospective study done in Najaf, during 1st of February to the 31st of October 2005.

Fourty- eight patients with active chronic suppurative otitis media were included in this study, full history ,otological examination, ear swab for culture were done as well as pure tone audiometry performed before and 2 weeks after treatment. All the studied patients treated systemically by appropriate dose of amoxicillin.

The commonest isolated organism was staphylococcus aureus (25%), followed by pseudomonas aeruginosa and streptococcus pneumoniae (18.7%) for each.

Garlic oil ear drops, neomycine dexamethason (neodexone) drops and normal saline 9% were used as local therapy (ear drops) randomly for the three equally divided groups of patients.

The use of Garlic oil ear drops associated with 81% complete improvement compared with 69% improvement by neomycin –dexamethason drops and only 25% for normal saline drops, the interesting fact that improvement by the use of Garlic oil ear drops occurred earlier than the use of neomycin – dexamethason and normal saline ear drops.

No complication was detected as a result of treatment by any of the above treatment.

Introduction:

Chronic suppurative otitis media (CSOM) is a chronic infection of the middle ear, defined as otorrhoea of at least 2 weeks duration in the presence of tympanic membrane perforation.⁽¹⁾

Active CSOM forms a major proportion of the clinical work load of an average otolaryngological practice.⁽²⁾

Otological antibiotic treatment is more effective than systemic antibiotic therapy in eliminating otorrhoea in chronic suppurative otitis media⁽²⁻⁵⁾, probably because irreversible tissue damage and fibrosis caused by infection renders systemic therapy less effective.

Neomycin is particularly valuable against *Proteus* and *Staphylococcus aureus* but is ineffective against Gram-negative, anaerobes and has limited action against *Pseudomonas aeruginosa* because of an increasing degree of resistant; the presence of steroid with an antibiotic drop enhances the efficacy of the antibiotic.⁽⁶⁾

The ancient Indians, Chinese, Egyptians, Greeks, Romans, and other peoples have used garlic for thousands of years, as food and as medicine. One of the most famed usages of garlic was during the Middle Ages, when it was reputed to have been highly effective against the plague.⁽⁷⁾

As early as 1858, Louis Pasteur formally studied and recorded garlic's antibiotic properties. Dr. Albert Schweitzer used the herb to successfully treat cholera, typhus, and dysentery in Africa in the 1950s. Before antibiotics were widely available, garlic was used as a treatment for battle wounds during both World Wars.⁽⁷⁾

Garlic (*Allium sativum*). Garlic, also known as poor man's or Russian penicillin, is found in many kitchens throughout the world.⁽⁸⁾

Standardized garlic doses include sulfur and allicin compounds. Allicin is the substance that gives garlic its antibiotic qualities. The sulfur compounds give garlic its familiar smell.⁽⁹⁾

Side effects include "fragrant" breath, rare instances of GI symptoms, changes to intestinal flora, and allergic reactions. Surgical patients consuming large quantities of garlic may experience increased blood loss with or without the use of additional blood thinners, aspirin, or NSAIDs, because of prolonged clotting times.⁽¹⁰⁾

Aim of the study: The aim of this study is to throw some light on the efficacy of Garlic oil ear drops in medical treatment of chronic suppurative otitis media.

Patients and methods:

This is a double blind randomized prospective study, done in otolaryngology department in assadr teaching hospital in the period from the 1st of February to the 31st of October 2005.

Forty-eight patients exhibiting otorrhoea-associated recurrent suppurative otitis media with tympanic membrane perforation were included in this study, their ages ranged from 11 to 67 years with mean age of 26 years, more than this number of patients was seen but they excluded because of cholesteatoma, marginal perforation, impending complication, aural polyps, associated otitis externa and children below 10 years. Swabs for culture were taken from all the studied patients, pure tone audiometry also done before and 2 weeks after local treatment.

All the studied patients were treated systemically by the appropriate dose of amoxicillin.

Garlic oil ear drops, neomycin-Dexamethason (Neodexon) and normal saline (9%), put in identical darkly brown bottles, labeled with code number only, were randomly given to the 3 studied groups (each one included 16 patients), the dose was 3 drops, three times daily for 2 weeks, before which they instructed to clean the ear by self-made cotton buds, the patients also informed to prevent water from gaining access into the ear, Assessment was based on symptomatology and examination which is done after the 1st and 2nd weeks of treatment.

I suggest a simple score for assessment of improvement, including tinnitus, amount of ear discharge, types of discharge, middle ear mucosal congestion and oedema, and hearing threshold represented by air-bone gap. (ABG), completely improved patients should have 8-10 mark, partial improvement 4-7, no improvement 0-3 and worsen condition below 0.

The proposed scoring system

		Parameters						
Tinnitus	No	2	Decrease	1	Same	0	Increase	-1
Amount of discharge	No	2	Decrease	1	Same	0	Increase or pulsatil	-1
Type of discharge	No	2	Mucoid	1	Mucopus	0	Purulent	-1
mucosal congestion	No	2	Mild	1	Same	0	Increase	-1
Air-bone gap by PTA	Significant decrease	2	Insignificant decrease	1	Same	0	Increase gap	-1

Results:

The results of cultures of ear swabs of the studied patients are shown in table I. Staphylococcus aureus was the commonest organism, observed in 12(25%) patients, followed by pseudomonas and streptococcus pneumonia 9(18.7%) patients for each. In nine patients no growth was detected.

Table (I): Types of organism in patients with CSOM

Type of organisms	No.	%
Staphylococcus aureus	12	25
Pseudomonas aeruginosa	9	18.75
Streptococcus pneumonia	9	18.75
Proteus sp	4	8.33

Klebsiella sp	3	6.25
E. coli	2	4.16
No growth	9	18.75
Total	48	100

Table II shows the improvement of CSOM according to different local therapy. Eighty-one percent of those treated by Garlic oil ear drops were improved completely, while only one patient (6%) not improved and no patients underwent worsen in his or her condition, eleven patients who comprises 69% of those used Neodexon drop were completely improved, and 3 patients (19%) partially improved but in only 12% of patients there were no changes in their condition had been occur. Normal saline drop show discouraging result that is only 4 patients (25%) showed complete improvement, but in 10 patients there were no change of their condition (62%).

Table (II): Improvement according to different type of local therapy

Improvement \ Drug	Garlic oil		Neodexon		Normal saline	
	No.	%	No.	%	No.	%
Completely improved	13	81	11	69	4	25
Partial improvement	2	12	3	19	2	12
Same condition	1	6	2	12	10	62
Worsen condition	0	0	0	0	0	0
Total	16		16		16	

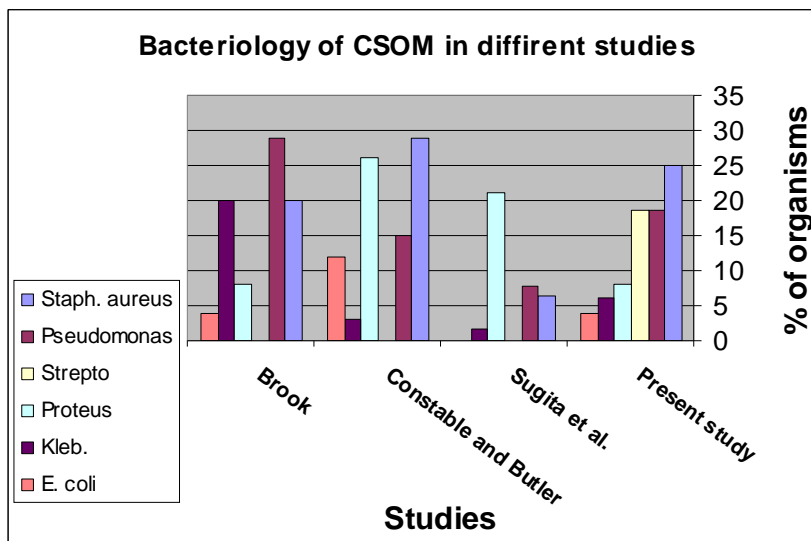
P – Value

Chi - square

Discussion:

Histogram I shows the organism cultured in different studies 5, compared to our study, the difference may attributed to the previous wrong self use of antibiotics which change the environment of organisms. The causes behind negative culture in 9 patients probably due to anaerobic infection, laboratory error or due to antibiotics taken before culture.

Histogram I: comparison of bacteriology of CSOM in different studies



Improvement expressed as cure of otorrhoea and middle ear mucosal inflammation.^(11,12) The use of Garlic oil ear drops associated with 81% complete improvement (13 patients) after the treatment course, and the interesting fact is that improvement occurred earlier than the use of Neodexon drops and normal saline.

The antimicrobial activity and other medical benefits of garlic oil have been widely recognized.⁽¹³⁻¹⁵⁾ These benefits have been attributed to the presence of sulphides in garlic oil.^(14,15) Because they are easy to obtain or prepare as well as having good stability, the medical properties of the garlic constituents diallyl monosulphide and diallyl disulphide have been the focus of many studies.⁽¹⁶⁻¹⁹⁾ A chemical analysis of garlic oil showed that 54.5% of the total sulphides comprised diallyl monosulphide, diallyl disulphide, diallyl trisulphide and diallyl tetrasulphide 20. Although diallyl trisulphide and diallyl tetrasulphide accounted for 26.6% of the total sulphides in garlic oil, little attention has been paid to the medical benefits of these two components. The inhibitory effect of diallyl disulphide, but not diallyl monosulphide, against *C. Albicans* has been reported previously 21; however, information regarding the activity of these two agents against *Aspergillus* spp. and MRSA is limited. The antimicrobial activity of garlic extract against *S. aureus* has been observed 22; however, whether garlic oil can inhibit MRSA and fungal pathogens remains unknown. Also, the compounds in garlic oil responsible for any inhibitory effect require further elucidation.

In the present study there were no any signs, symptoms or pure audiometric features of ototoxicity resulted from Garlic oil ear drops therapy.

No allergic reaction was reported during the use of Garlic oil ear drops in this study.

In conclusion, Garlic oil ear drops probably highly recommended in medical treatment of active CSOM but this needs further confirmation by other extended studies.

References:

1. WHO/CIBA Foundation Workshop. Prevention of hearing impairment from chronic otitis media. London, 19-21 November 1996. Geneva: WHO, 1998. (WHO/PHD/98.4).
2. Abbasi AM. Comparative study of different modalities of medical treatment of CSOM. *Basrah Journal of Surgery*. 2004; 10: 42-50.
3. Acuin J, Smith A, Mackenzie I. Intervention for CSOM (cochrane review). In: *The Cochrane library*, Issue 1, 2003. Oxford: update software.
4. Youngs R. Chronic suppurative otitis media-mucosal disease. In: Lunman H, Wright T, eds. *Disease of the Ear*. 6th ed. London, England: Edward Arnold Publishers Ltd; 1998: 374-385.
5. Sheno PM. Management of CSOM, In: Booth JB Scott-Brown's otolaryngology. 5th ed. Butter worthe, 1987; 215-237.
6. Alpert CM *et al*. Treatment of CSOM with topical tobramycin and dexamethasone. *Arch-Otolarygal-Head-Neck-Surg*. 2000; 126: 165-73.
7. Jamison Sstarbuck. Garlic powerful medicine-pungent. *Better Nutrion*.2000.

8. W J Murray, "Herbal medications for gastrointestinal problems," in *Herbal Medicinals: A Clinician's Guide*, eds L G Miller, W J Murray (New York: Pharmaceutical Products Press, 1998) 143-145; Fetrow, Avila, Professional's.
 9. "Smartbasics: Garlic." Available from http://www.smartbasics.com/glossary/garlic_glos.htm. Accessed 4 June 1999.
 10. (2000) AORN Volume 72 (5), November 2000, p 783, 785-786, 788-794, 796, 798-800, 802-804. Herbs and the Perioperative Patient.
 11. Couzos S, Lea T, Muller R, Murry R, Culbong M. effectiveness of ototopical antibiotics for CSOM. *MJA* 2003; 179 (4): 185-190.
 12. Supiyaphum P *et al.* Comarison of floxacine otic solution with oral amoxicillin plus chloramphenical ear drop in treatment of CSOM with acute exacerbation. *J-Med-Assoc-Thai*. 2000; 83:61-8.
 13. Yoshida S, Katsuzaki H, Ohta R. *et al.* An organosulfur compound isolated from oil-macerated garlic extract, and its antimicrobial effect. *Biosci Biotechnol Biochem* 1999; 63: 588–590. [Context Link].
 14. Agarwal KC. Therapeutic actions of garlic constituents. *Med Res Rev* 1996; 16: 111–124. ExternalResolverBasic Bibliographic Links [Context Link].
 15. Liu C-T, Chen H-W, Sheen L-Y, Kung Y-L, Chen PC-H, Lii C-K. Analytical methods–effect of garlic oil on hepatic arachidonic acid content and immune response in rats. *J Agric Food Chem* 1998; 46: 4642–4647. ExternalResolverBasic Bibliographic Links [Context Link].
 16. Wargovich MJ. Diallyl sulfide, a flavor component of garlic (*Allium sativum*) inhibits dimethylhydrazine-induced colon cancer. *Carcinogenesis* 1987; 8: 487–489. ExternalResolverBasic Bibliographic Links [Context Link].
 17. Haber-Mignard D, Suschetet M, Berges R, Astorg P, Siess MH. Inhibition of aflatoxin B1- and N-nitrosodiethylamine-induced liver preneoplastic foci in rats fed naturally occurring allyl sulfides. *Nutr Cancer* 1996; 25: 61–70. ExternalResolverBasic Bibliographic Links [Context Link].
 18. Dwivedi C, Abu-Ghazaleh A, Guenther J. Effects of diallyl sulfide and diallyl disulfide on cisplatin-induced changes in glutathione and glutathione-S-transferase activity. *Anti-cancer Drugs* 1996; 7: 792–794. ExternalResolverBasic Bibliographic Links [Context Link].
 19. Haber D, Siess MH, Canivenc-Lavier MC, Le Bon AM, Suschetet M. Differential effects of dietary diallyl sulfide and diallyl disulfide on rat intestinal and hepatic drug-metabolizing enzymes. *J Toxicol Environ Health* 1995; 44: 423–434. ExternalResolverBasic Bibliographic Links [Context Link].
 20. Lawson LD, Wang ZJ, Hughes BG. Identification and HPLC quantification of the sulfides and dialk(en)yl thiosulfinates in commercial garlic products. *Planta Med* 1991; 57: 363–370. ExternalResolverBasic Bibliographic Links [Context Link].
 21. Naganawa R, Iwata N, Ishikawa K, Fukuda H, Fujino T, Suzuki A. Inhibition of microbial growth by ajoene, a sulfur-containing compound derived from garlic. *Appl Environ Microbiol* 1996; 62: 4238–4242. ExternalResolverBasic Bibliographic Links [Context Link].
- González-Fandos E, Garcia-López ML, Sierra ML, Otero A. Staphylococcal growth and enterotoxins (A–D) and thermonuclease synthesis in the presence.