The effect of Garlic aqueous extract on infected wound healing in goat

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Abstract
Garlic aqueous extract were prepared by homogenization of 40 gm. of garlic with 100 ml of water by blender for 2 minute. The homogenate was transferred to volumetric flask with addition of 200 ml water and stirred magnetically over night at 45C for 24 hours, later the residue were filtered. For 2-3 times. Then the extract were evaporated to dryness (\(<452) under reduced pressure in rotary evaporator. The weight of crude extract were measured (18 gm). A totally the clinical cases (wounds) were 20 goats, treated between March to August 2005. The wound length were varied between 3-6 cm. The animal were divided into two groups (treated and control group each of them 10 goat), all the animals received similar management exersis and we found that study group show hasten in wound healing is compare to that control group. Histological study shows result in 7, 10, 15, 21 days, it is a good healing in short period and no any complication.

Introduction
Garlic is a member of the lily family and is one oldest cultivated crops dated back to before records begun. Originating in Asia , it has been known and utilized as a herbal remedy for thousand of years ago. It is one of the oldest known healing herbs. Garlic was used at the beginning of recorded history and was found in Egyptian pyramids and ancient greek temples. There are biblical references to garlic in many cultures. Hippocrates the revered physician proscribed garlic for wound 460-370 BC (1,2). In ancient time the Babylonians, Egyptian, Phoenicians, Viking, Chinese, Greeks, Romans and Hindus used garlic frequently (3). Historically been one of the most common vegetable serve a both spice and medical herb in many countries. It has long been revered for its medicine properties evidencing by ancient worker from oldest civilization like Egypt, Greece, China and India. It is highly antiseptic and his many marvellous effect and healing powers have been cleaned. However the use of garlic in the world war as an antiseptic was most sensational (4). The use of garlic to treat wound surface and repeatedly through the middle ages into world war II when garlic was used to treat wound of shoulder. Garlic was sliced and applied directly to wound to inhibit the spread of infections (5). Mentioned that raw juice of garlic was expressed, diluted with water, and put on swabs of sterilized sphagnum moss which was applied to the wounds for the control of suppuration. Where this treatment was given, it has been proved that there has never been one single case of sepsis of septic results. Also mentioned that the prophet Mohammed recommend that garlic be applied externally on the sting of the scorpion or the bite of the viper in the 4th century. He also stated that the clinical use of garlic was satisfactory in repairing eardrum perforation. However in breaking near of herbal healer academy Wednesday Dec 19 2001 and under a hood of garlic blasts worst antibiotic resistant bacteria. Microbiology researchers said that the activity ingredient in garlic compound two of the nattiest antibiotic resistant microbe faced by doctors and patents. The ingredients substance known is allicin has been found effective in killing of Methicillin resistant Staphylococcus aureus microbe that has especially troubling in skin and soft tissue wounds (6). Stated that garlic his many marvellous effects and healing powers. It is an antiseptic its used has been long recognized in the later war, it was widely employed in control if suppuration in wounds. The row juices expressed diluted with wale, and put on
swabs of sterilized Sphagnum moss, which are applied to the wound where this treatment has been given it has been proved that their have been no septic result and the live of thousands of men have been saved by its use. It is some time externally applied in ointment and lotions, and as an antiseptic to disperse hard swelling (7). Stated that garlic breasts along history of medicinal uses it has antivirus, antibacterial and antifungal properties. It is active against Mycobacterium cystis, Cytomegalovirus(8,9). Scientific researchers have isolated many diverse and powerful chemical compounds in Echinacea. Studies have basically traditional native healing uses for plant. Echinacea is anti inflammatory, has strong wound healing action and stimulates the immune system, it is useful for treatment gangrene, venomous insect or animals bites. There for and according to (10) in which he stated that garlic appears to have antibiotic activity, whether taken internally or applied topically. The aim of this study is to find out the effect of aged garlic extract on infected wound healing in goat.

Material and methods

Garlic bulbs (cloves) were peeled off and washed. A 40 gm of garlic were taken in 100 ml of water. Homogenized by a blender for two minute. The homogenized were transferred to a volumetric flask, where 200 ml of water added and stirred magnetically over night at 45C, then after 24 hrs the residue were removed by filtration for 2-3 time. The extract were evaporated to dryness under pressure in a rotary evaporator. The weight of the crude extract obtained from 40 gm garlic bulbs were measured. Wounds, a total of (20) goats, clinical cases, were treated in the period March – August 2005 in the Basra province of veterinary medicine college, formed the material for these study. The wounds occur because the trauma of the skin. The wound vary in length about 3-6 cm. The cases were treated, and study group treated (10 goats) with Garlic extract dressing, but a other group (10 goats) is control. The general management was the same are followed for all cases. In the study group treated with Garlic extract show the skin were excised and then put extract. The wounds were clinically examined daily for color exudation, granulation tissue formation, visualization and general appearance. In the study group treated with garlic, the amount is used in the site of wound, topically in once for all treated group, should be loose skin were excised. After washing of the wound with normal saline, and then should be biopsy in 7, 10, 15, 21 days to histological study using (H & E. stain).

Results

One week post wounding the animals of treated group showed bright red healthy granulation tissue starting from the wound adages to the center. As well as the treated group by Garlic doesn’t present any complication, this result occurs after 48 hours from using the Garlic. In second week should be clear new tissue in site of wound, but in third week the line of wound is disappearing finally, when compare with control group is vary in time and rate healing. The study showing a differences changes on histological finding between treated and control group in different period. On the seven day biopsy showed that epithelial section filled the wound with the new blood vessel, compared with that of control which showed spongiosis and edema with inflammatory cells, RBC’s, as well as mature collagen fibers tissue in early stages (Fig-1). On the ten day, shades of study group showing inflammatory cells (monocytes & macrophages) and dense collagen fiber with decease number of blood vessel, which is and control group (Fig-2). After tow weeks should be decease in present inflammatory cells such as monocytes fill the space with a dense of collagen fibers (Fig – 3). While shid of 21 day decrease monocytes in collagen fiber, and don’t found any inflammatory reaction in this stage noted epidermis to the normal structural of skin (Fig-4).
Fig.(1): longitudinal section in treated wound shows inflammatory cells & dense collagen fibers & crystal of pectin (X100 H & E. stain) 7 days.

Fig.(2): longitudinal section of treated wound shows dense collagen fibers & fibroblast (X100H & E. stain) 15 days.
Fig. (3): Longitudinal section in treated wound shows macrophages & monocytes (X200 H & E. stain) 15 days.

Fig. (4): Longitudinal section in treated wound shows, don’t found any inflammatory reaction, the structure of line wound as a normal (X100 H & E. stain) 21 days.
Discussion

Categorizing wounds on injured animals is more than purely academic exercise. Preoperative classification of a wound helps the surgeon to decide the most appropriate treatment. Second intention healing is the only acceptable choice for contaminated wounds to heal. However, the shape and the location of such wounds play a role in healing process. In the present study it was easy to inflict and judge healing of such square wounds.

Regarding the use of medicinal plant such as Garlic in treatment of open infected wounds may have anti-inflammatory, astringent, analgesic, antiseptic and vulnerary actions. In conclusion, the obtained results proved that the use extracts of material Garlic, results in the treatment of infected wounds. This extracts should be prepared and has no harmful side effects (19). The role of Garlic extract which enhance in wound healing through the infected wounds, reduce wound contraction and scarring, quick closure and reduce treatment costs (7,20,21). Further support for the mechanism of accelerated wound healing with allicin has recently been uncovered, suggesting Garlic (a complex form of tow sulfur containing amino acid of Garlic S-inethyl cysteim sulfa oxide and S-allyl cystein sulfoxide) were shown to the responsible for the role in wound healing, as well as, that alliinase, the enzyme that catalyzes the conversion of alliin to allicin (8,11,12,19). Garlic is strong stimulant which hastens growth of new Granulation, contains allin (C, H11o3 NS) with rapidly breaks down to yield the antibiotic allicin (C6H10OS2) in the presence of enzyme allinase and water (4,13,17). It is very well known that Garlic contains all the elements except vitamin-D. It is also known that Garlic essence warms the body and promotes better circulation of the blood (15,18). Garlic seems to have antimicrobial and immunostimulating properties enhance fibrinolytic activity and exert favorable effect on platelet aggregation and adhesion. Recent, studies have shown that oxidative phenomena play a significant role in the path-physiology of wound healing (6,7,14). Garlic gives a fast rate of tissue regeneration and suppression of inflammation due to the role of antibacterial properties clearing infection (2,16). The present study was conducted on infected wound goat. Garlic extract treated wound was found to heal earlier than these treated with conventional methods. Numerous herbs (and their essential oils) have antibacterial properties and for this reason might theoretically be helpful for preventing wound infection. Although Garlic attacks bacteria and other microorganisms, directly, it also stimulates the body’s natural defenses against these invaders. Garlic's remarkable and legendary power against infection diseases is due to a combination of both these properties (10,11,20). Garlic or its constituents activate phagocytes, B-cells, and T-cells, all three levels of the cellular immune system. For instance, dilly trisulfide, a constituent of Garlic, was found to activate natural killer cells and Macrophage, directly, and indirectly to increase B-cell activity to make antibiotic and has been known as (Russian penicillin). The substance allicin is to have the antibacterial equivalence of penicillin (8,21).

References

تأثير خلاصة الثوم على التئام الجروح الخمجة في الماعز

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الخلاصة

استهدفت هذه الدراسة الوقوف على تأثير خلاصة بعض النباتات الطبيعية مثل الثوم على التئام الجروح الخمجة بالقصصد الثاني في الماعز. ولدراسة تأثير هذه الخلاصة أُعتبر استخدام الفئات السريرية والنسجية للجروح مقاييس الدراسة وقد أُتم من النتائج بأن المجموعة المعالجة بخلاصة الثوم كانت أفضل من مجموعات السيطرة.