



Garlic Oil. Its use in equines as a promoter of cicatrisation

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ABSTRACT

The aims of this work was to evaluate whether garlic oil, home-made use empirical formulation, promotes health wound in equines. For that purpose, 5 horses were employed to which 2 circular wounds were made in the neck, one treated with 0.9% physiological solution (witness) and the other with garlic oil, which was previously prepared with peeled garlincs and fried in sunflower oil, using only the obtained oil. After 3 days, all the wounds presented a reddish colour, with yellowish serous exudation and its borders inflamed. Afterwards, the wounds treated presented a rosy colour – yellowish, with granulation and dry tissue – while the witnesses remained with inflamed borders and exuding for 5 more days. The total scarring of the treated wounds occurred around the 28th day and around the 38th day among the witnesses. The hystopathological report proved that after 28 days of treatment, the treated wounds presented cicatricial tissue almost fully developed, while the witnesses still showed areas of granulation tissue turning to scar. It can be concluded that Garlic Oil can be utilized to favour cicatrisation of wounds in equines.

Key words: garlic, wound, scar, equines.

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Introduction

Garlic (*Allium sativum*) has been used as a culinary spice and as a medicine herb from immemorial times (De Hoyo, 1999; Jesse et al., 1997).

One of the most researched properties of garlic is its effects over the heart and the circulatory system, as it facilitates blood flow through the capillaries helping to reduce blood pressure. Garlic is also well-known for its property of preventing arteriosclerosis since it contains an antioxidant property, which reduces cholesterol and lipid levels in blood. Many researchers have focused their studies on its antidiabetic activity because of its power to reduce reasonable high blood sugar levels. It has also been proved that garlic inhibits blood platelet aggregations and activates fibrinolysis in wounds and skin inflammations. In addition, it has been shown its importance as an antimicrobial agent against bacteria, viruses, parasites and fungi, after being used to heal skin infections. (De Hoyo, 1999; Foster, 2000; Jesse et al., 1997; Koch and Lawson, 1996; Langer, 1998).

Garlic contains condensed glucides of the fructose type; it is rich in vitamins A, B1, B2, C, amines from nicotinic acid, choline, hormones, sulfonic acid, iodine and uranium traces (Gracia Alonso, 1990). Other important components are the glutamyl dipeptides with radicals of sulfur, such as alliin and allicin (García Alonso, 1990) which have organoleptic and medicinal properties.

Traumatic lacerations are quite common among equines and they constitute a great percentage of diagnosed surgical pathologies (Bogado et al., 2005). Complications during treatment may derive in the formation of exuberant granulation tissue, excessive fibrosis, development of tares and physical handicaps that may compromise the performance and/or wellbeing of the animal (Adams, 1979).

Some natural products have been utilized as alternative medicine. Some examples of these include the use of emu oil (El emu, 2006), and ñandu oil (Salvi et al., 2007). Salvi et al. (2004) have found encouraging results in the treatment of surgical wounds with garlic oil in donkeys. What is more, Cocco et al. (2005) have published the successful treatment with garlic oil of an exposed and contaminated ulna and radius fracture of a canine.

The aim of this project was to evaluate garlic oil effects as a promoter of scarring in equines skin.

Experimental

Preparation of Garlic Oil

Three garlic heads were utilized every 500ml of sunflower oil. The garlic heads were peeled, cut and boiled in the oil. Once the preparation was ready, it was cooled and finally, it was filtered so as to remove the garlicks. The obtained oil was kept in glass jars at room temperature.

Animals

Five horses from the Faculty of Agronomy and Veterinary of U.N.R.C. were studied. The animals were selected on the basis of a previous clinical exam and only the horses that were in a general good physical state, without previous medical history of injuries and/or illnesses and which did not present any wounds nor traumatism in the neck area were joined to the project. All animals were Tetanus vaccinated and given a second shot after 15 days and they were deparasitated 15 days before the experiment.

The selected animals had their neck areas cleaned and shaved on both sides. Afterwards, they were antiseptized with 96% alcohol and 1% povidone iodine, as if preparing a surgical field.

Physiological solution of 0.9% sodium chloride was used on the witnesses. After that, local anaesthesia was conducted in the area, in the shape of an inverted L, with 2% lidocaine.

Two wounds were made in the area previously prepared: two on each side of the neck, separated at a distance of 10 cm. one from the other, one of which was used as a witness, and the other one, to try the garlic oil preparation.

The wounds were made with Metsembaum scissors, being the skin cut down to the subcutaneous tissue, with approximate dimensions of 25 mm diameter and 2 mm deep. Immediately after that, hemostasis in the area was carried out by compression or clamping. Garlic oil was spread in one of the wounds after 24 hours post-surgery and until the healing was complete, while the other wound (the witness) was cleaned with physiological solutions of 0.9% sodium chloride, both treatments being carried out once a day.

Parameters evaluated and data record

The physiological constants of each animal were examined daily.

In relation to the wounds, it was evaluated:

- Diameter and depth.
- Appearance, colour and exudation presence.
- Biopsies of the wounds were made 3, 6, 9, 12, 15 and 21 days after the surgery and when the scarring was complete.



Results and Discussion

The wounds were of a reddish colour, with the presence of yellowish serous exudation and its borders were inflamed during the first 3 days (Fig. 1).



Figure 1: Superior witness and inferior treated wound of horse 1 on the 3rd day of the experiment.

On the 4th day, the wounds treated with garlic oil showed a rosy colour – yellowish, with the presence of granulation and dry tissue. In the witness, the granulation tissue started to proliferate after the 6th day (Fig. 2).



Figure 2: Superior witness and inferior treated wound of horse 1 on the 4th day of the experiment.

Borders inflammation started to diminish on the 3rd day in the treated wounds and on the 7th day in the witnesses (Fig. 3)

The wounds treated with garlic oil healed completely around the 28th day and the witness group healed around the 38th day (Fig. 4)

After analyzing the initial surface and the total time that the wounds took to heal, it can be inferred that the scarring occurred at a speed of

34,45 mm²/day in the group of wounds treated with garlic oil while for the witnesses, the scarring occurred at 28,37 mm²/day.



Figure 3: Superior witness and inferior treated wound of horse 4 on the 6th day of the experiment.



Figure 4: Superior witness and inferior treated wound of horse 3 on the 30th day of the experiment.

If one considers the evolution of the perimeter of the wounds in both groups during the experiment, it can be observed that the treated ones showed a speed of centipede contraction of 3,93 mm/day, while the witnesses, a speed of 3,06 mm/day.

The hystopathological report testified that the granulation tissue started to appear on the 3rd day in the treated wounds and that it was abundant 12 days after the surgery. In the witnesses, it was observed the appearance of granulation tissue on the 6th day and it was full on the 18th day. The cicatricial tissue was almost ready on the 28th day in the treated wounds, while the witnesses still showed some granulation tissue turning to scar on that day.

After analyzing all the data collected in this project, even though there are some differences between the experiment groups, it can be generally



observed that it coincides with the information provided in the consulted bibliography (Barbet et al., 1998; Bojrab, 1982; Hakett, 1983; Salvi et al., 2004; Salvi et al., 2007; Stashak, 1989; Stashak, 1994).

The speed at which the wounds healed, that is to say, the diminishing of the surface created, in relation to time are inferior to the ones reported by Salvi et al. (2004) in donkeys.

When considering the evolution of the wounds perimeter in both groups during the experiment, it can be observed that the data obtained is superior to the one provided by Stashak (1994) in equines, yet inferior to the ones reported by Salvi et al. (2004).

The granulation tissue was observed 3 days after the surgery among the group treated with garlic oil and after 6 days in the witness group, information that coincides with what Stashak (1994) and Salvi et al. (2004) described; though the wounds treated coincide with the data cited by Salvi et al. (2004), and the witnesses coincide with Stashak's data (1994).

Conclusion

It could be concluded that Garlic Oil is a preparation made out of natural products, easy to create and that can be used to promote scarring in wounds of equines.

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