

Ethnoveterinary Approaches for Recalcitrant Wound Treatment in Geriatric Farm Animals

Saravanan S^{1*}, Elamurugan A², Anbarasu M³, Sumitra A⁴, and Durai Singh R⁵

ICAR-KVK, Madurai- 625 104

(Received : September, 2023 140/23 Accepted : January, 2024)

Abstract

The inclusion of ethnoveterinary medicine (EVM) in healthcare for livestock is increasingly important in the era of antimicrobial resistance. The present study involves two geriatric cattle, a 14-year-old cow and an 11-year-old bullock with recalcitrant wound. An herbal formulation consists of *Acalypha indica*, *Curcuma longa* and *Allium sativum* mixed in Sesame oil as base was prepared and applied on the recalcitrant wound. The herbal formulation was aided in the complete healing of the wounds. The study provides insight into the application of EVM in geriatric high-value farm animals.

Key words: Ethnoveterinary Medicine, Geriatric animals, Wound Healing, *Acalypha indica*

Ethnoveterinary Medicine (EVM) is a scientific term for traditional animal health care that encompasses the knowledge, skills, methods, practices, and beliefs about animal health care found among community members. It has been observed that the traditional knowledge of EVM is now confined only among the surviving older people and a few practitioners in the tribal communities (Usha *et al.*, 2016). Lack of documentation of ethnoveterinary practices makes it difficult to know how long a particular remedy has been in use and whether the

preparation or administration method has ever been altered or not. Livestock industry provides for a major source of livelihood for many people worldwide, particularly the rural poor especially tribal communities in developing countries. Most of these communities live in marginal areas affected with endemic pathogens, vectors and diseases. Hence, health care issues are a major constraint to livestock production and development in these rural and peri-urban communities where a half of the world's livestock population is found (Wanzala *et al.*, 2005).

Wound treatment using ethno-medicines in animals is an emerging field of research that holds great promise for the effective management of wounds in veterinary geriatrics. Ethno-medicines, which are derived from traditional medicinal practices, have been used for centuries to treat various ailments in both humans and animals. In recent years, there has been a renewed interest in ethno-medicines as an alternative or complementary approach to conventional medicine. In this context, EVM has emerged as a promising therapy for wound treatment in veterinary geriatrics (Lans *et al.*, 2007; Wani and Pant, 2020). Even though several studies have been done to demonstrate role of various herbs in wound healing, to best of our knowledge none of them were performed in field conditions. The present study is to document the successful management of wound management in old animals using Ethnoveterinary preparations under field conditions.

Materials and Methods

Two cases were recorded at the Agricultural College and Research Institute, Madurai. The

*Corresponding author : Email : saravanan.s@tnau.ac.in

¹Assistant Professor, ICAR-KVK, Madurai- 625 104

²Assistant professor, Vaccine Research Centre-Viral Vaccines, Centre for Animal Health Studies, TANUVAS, Chennai -600051

³Assistant Professor of Agronomy, School of Agriculture, Vels Institute of Science, Technology & Advanced Studies (VISTAS), Pallavaram, Chennai - 600117

⁴Assistant Professor, ICAR-KVK, Virudhunagar - 626 107

⁵Professor and Head, Dept. of Agronomy, AC&RI, Madurai - 625 104.

first case involved an 11-year-old bullock (Animal No. CBE 1447, Case I), which had sustained a deep gore injury (Fig.1) in the arm pit region of its left forelimb. The wound was approximately 6 inches deep, with profuse bleeding, and the animal was in considerable pain. The second animal was a 14-year-old pregnant cow (Animal No. MDU-402, Case II) with a maggot wound on the lateral part of the stifle joint on the left hindlimb.

Initially, the animals were treated with allopathic drugs. The injured bullock was restrained, and the wound area was cleaned and debrided. The pouch created due to the gore injury was washed with saline, and a suture was applied to the fascia, muscle, and skin. A small opening was retained at the base to enable the draining of the wound. The animal was treated with streptopenicillin, meloxicam, and vitamin supplements over two weeks. During treatment period, the bullock was restrained from movement, and feed and water were provided.

The pregnant cow with a maggot wound in the stifle joint was treated with turpentine to aid in the removal of maggots. Topical cream (Topicure®) was applied over the wound area for about a fortnight.

However, in both animals the wounds became recalcitrant, and there were no signs of improvement. Both animals developed maggots in their wounds despite the topical application of antiseptics and larvicides. The health of the animals was declining due to the constant irritation caused by the wounds.



Fig. 1. Bullock, aged 11 years exhibiting gore injury in armpit area (Case I)

Preparation of ethnoveterinary herbal recipe

The EVM paste was prepared using a traditional method, which involved grinding a handful of *Acalypha indica* (50g, whole plant except root), 10g of *Curcuma longa* powder, and two pulps of *Allium sativum* (15g). The paste was then gently heated with 50 ml of Sesame oil (*Sesamum indicum*).

To begin the wound healing process, the wounds were thoroughly cleaned with 1% salt water solution. The EVM paste was applied to the wound five times daily after each cleaning (Fig. 2). The wounds were monitored for signs of healing such as the formation of granulation tissue, reduction of swelling, and the closure of the wound.

Results and Discussion

Both the animals were initially treated with allopathic medicine over a period of fortnight did not show any significant improvement in the wound healing. However, after the application of the ethnoveterinary herbal recipe, there was a significant improvement in the wound healing process. The maggots were completely eliminated from the wound site and further complications did not arise. The wound healed rapidly, and

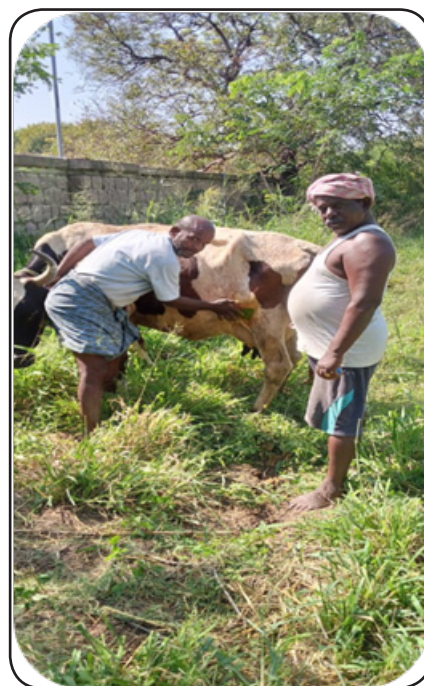


Fig. 2. Application of EVM paste to case II

there was no sign of irritation as indicated by the absence of self-mauling. The wound healed completely within a week without formation of any scar tissue, as shown in the figure 3A&3B.

The use of EVM in wound treatment of geriatric animals can provide a viable alternative to allopathic medicine. This is particularly important in cases where routine allopathic treatments have failed to produce desirable results, as was observed in the two cases presented in this study. The use of traditional plant-based medicine in primary healthcare of livestock is becoming an increasingly important intervention for improving livestock productivity (Njoroge *et al.*, 2004).

In both cases presented in this study, the initial use of allopathic medicine failed to produce the desired result. The antibiotic treatments were effective in preventing the wound from becoming infected, but the wound healing process was delayed due to the age factor of both the animals. Once EVM treatment was initiated, a significant improvement in wound healing was observed. This is consistent with previous studies that have reported the efficacy of EVM in wound healing (Mukandiwa *et al.*, 2014).

Acalypha indica, also known as Indian Nettle or Clearing Nut, is a medicinal herb that has been used in traditional ayurvedic and siddha medicine for centuries. It has been found to have a wide range of therapeutic properties, including anti-inflammatory, antimicrobial, and wound healing effects. Studies have shown that *Acalypha indica* can accelerate wound healing

by promoting tissue regeneration, reducing inflammation, and preventing infection. Topical application of *Acalypha indica* extract significantly increased the rate of wound contraction and epithelialization in rats (Vijayakumar *et al.*, 2011).

The use of turmeric (*Curcuma longa*) in wound healing has been well documented in both human and veterinary medicine. Turmeric has been found to have anti-inflammatory, antimicrobial, and antioxidant properties, making it a potent natural remedy for wound healing. Studies have shown that the active compound in turmeric, curcumin, can accelerate wound healing by promoting tissue regeneration, reducing inflammation, and preventing infection (Thangapazham *et al.*, 2011). In veterinary medicine, turmeric has been used as a topical application for wound healing in various animal species, including horses, dogs, and cattle (Gupta *et al.*, 2020).

Garlic (*Allium sativum*) has been traditionally used for its medicinal properties for thousands of years, and its potential health benefits have been well-documented in scientific studies. The active compound in garlic, allicin, is known to exhibit a wide range of biological activities, including antimicrobial, anti-inflammatory, and antioxidant properties. These properties have been linked to the promotion of wound healing. Garlic extract increases collagen deposition and improves tensile strength in the wound area, indicating that garlic may promote wound healing by stimulating collagen synthesis and deposition (Khalil *et al.*, 2017). Garlic-based



Fig. 3A. Complete healing of wound without any scar after treatment with EVM paste for case I



Fig. 3B. Complete healing of wound after treatment with EVM paste for case II

ointment was found to significantly increase the rate of wound healing, reduce inflammation, and promote tissue regeneration in patients with diabetic foot ulcers (Eteraf-Oskouei and Najafi, 2013). In addition to its wound healing properties, garlic has also been shown to have bactericidal activity against *Staphylococcus aureus* and *Escherichia coli* (Kale *et al.*, 2021). Furthermore, anti-inflammatory and antioxidant properties of garlic have been linked to its ability to reduce oxidative stress and inflammation in the wound area, which may further promote wound healing (Ocoy *et al.*, 2020). In veterinary medicine, gingelly oil has been used as a carrier oil for several herbal remedies, including turmeric, neem, and garlic. The use of gingelly oil as a carrier oil for EVM has been found to increase the bioavailability and efficacy of these herbal remedies in wound healing (Sharma *et al.*, 2019).

The use of herbal paste consisting of *Acalypha indica*, turmeric and garlic, along with the carrier Gingelly oil, has demonstrated a positive effect in promoting wound healing in geriatric animals. The traditional knowledge and medicinal properties of these ingredients have been harnessed in the form of EVM, resulting in a natural and effective treatment option for recalcitrant wounds in veterinary geriatrics. Further research and clinical trials are warranted to explore the full potential of this EVM treatment in animal wound care.

In addition to the decreased healing time, the use of EVM also resulted in the complete elimination of maggots from the wound site. This is important as the maggots not only delay the healing process but can also lead to further complications in the animal health. The use of EVM in maggot wound treatment has been previously reported in the literature (Birhanu *et al.*, 2018).

Summary

Overall, the results of this study suggest that EVM can be a promising therapy for wound treatment in geriatric animals. The use of EVM is particularly important in organized farms and government institutions where the practice of EVM treatment techniques is limited due to the

belief that only allopathic medicines can provide immediate effects. The use of EVM provides an alternative approach to wound healing that can be both effective and sustainable in the long term.

Acknowledgement

Authors acknowledge their respective Universities for permitting to carry out the study. Authors duly acknowledge the contributions of Dr. N.Punnamurthy, Professor (Retired), Tamil Nadu Veterinary and Animal Sciences University towards the preparation of the herbal recipe used in this study.

Conflict of interest

Authors have no competing or conflict of interest

Authors Contribution

SS & EA - conceived the idea and written the manuscript, SS & RR – performed the experiment, DSR - monitored the experiment, AM & SA – assisted in preparation of the manuscript.

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Indian Vet. J., January 2024, 101 (1) : 37 - 42

A Study on Constraints of Dairy Farming in Telangana State

Y. Shyam Babu¹, A. Sarat Chandra², R.M.V. Prasad³, D. Nagalakshmi⁴ and M. Srinivas Reddy⁵

Department of Livestock Production Management, College of Veterinary Science, Rajendranagar, Hyderabad-500030 Telangana, India.
P. V. Narsimha Rao Telangana Veterinary University

(Received : September, 2023 172/23 Accepted : January, 2024)

Abstract

Dairy farming plays an important role in social and economic livelihood of the farmers of Telangana state. An investigation was carried out to study the cost of milk production in buffaloes of dairy farmers in Karimnagar, Khammam and Rangareddy Districts of Telangana. The data was collected from 240 farmers spread over 24 villages in 6 mandals in the selected districts. The 240 respondents were interviewed as per the questionnaire.

Constraints faced by the dairy farmers in the study area was non-remunerative price for milk stands first (63.11%) followed by high production cost of milk (59.23%), unstable prices (54.50%), high cost of veterinary medicine

(50.66%), lack of knowledge in making value added dairy products (46.66%), lack of preservation facilities for milk (44.88%), problem of mastitis in crossbred cows (42.33%), distant location of veterinary center (40.66%), competition for market from other processors (38.67%), lack of knowledge in clean milk production (35.77%). Lack of knowledge of deworming and vaccination were not identified as major constraint by majority. Poor road infrastructure, lack of clean milk production, high cost of utensils, distance of dairy co-operatives/milk collection center, high incidence of diseases was not identified by the farmers as major constraints faced by them.

Key words : constraints, non-remunerative price, high production cost of milk, problem of mastitis in crossbred cows.

*Corresponding author : Email : yeletishyambabu@gmail.com