

EFFICACY EVALUATION OF TOPICAL POLYHERBAL SPRAY IN THE MANAGEMENT OF WOUNDS IN LIVESTOCK

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Abstract– Profitability of any farm depends on the health of animals and wounds are a common problem in animals that negatively impacts their health and farm income. A trial was undertaken to evaluate the efficacy of a topical polyherbal spray in the management of wounds in livestock. 20 cattle having different types of wounds were assigned to one of two groups: Group T1, receiving treatment with Charmil[®] Spray (M/s Ayurved Limited, India), or Group T2, treated with popular competitor Brand X. The response to treatment was assessed based on clinical improvements and time required for wound healing. Based on findings of the study, Charmil spray was found to be superiorly efficacious in the management of wounds in cattle.

INTRODUCTION

Livestock frequently sustain wounds of various length and depth due to barbed wires, horn gores, insect bites, *etc.* If wounds are not treated in time, then fly infestation, maggots, and microbes may turn a clean wound into severely infected wound, which further leads to septicemia and delay in wound healing process. Therefore, timely and effective remedies are required for proper management of wounds. Various plant-derived oils, turpentine oil, *neem* oil, and clove oil, for example, have been reported to promote wound healing (Rahman *et al.*, 2009; Bwala *et al.*, 2011; Alam *et al.*, 2017). Several commercial preparations based on plant-derived oils have also been shown to be very effective in wound healing (Patel *et al.*, 2014; Patel *et al.*, 2015; Ranjith, 2018). Here, we report the findings of a trial undertaken to evaluate the efficacy of topical polyherbal spray in the management of livestock wounds.

MATERIALS AND METHODS

The trial was held from January to April, 2022 in the Indian state of Uttar Pradesh at Gangateeri Cattle Farm, Shahanshahpur, Varanasi (longitude: 82.97,

latitude: 25.32). 20 cattle of either sex, suffering from different types of pocketed wounds of varying severity, were randomly assigned to one of two treatment groups of 10 animals each. Group 1 received treatment with Charmil[®] Spray (M/s Ayurved Ltd., India) and Group 2 with popular competitor Brand X. In each case, the wound was cleaned with potassium permanganate solution, wiped with dry sterile gauze and treated twice daily with the respective treatment till recovery. In severely infected wounds, enrofloxacin @ 7.5 mg and meloxicam @ 0.5 mg per kg body weight of animal were additionally administered. Before initiation of treatment, the wounds were graded by the attending clinician (on an ordinal scale of 1-5; 1 being least severe and 5 being most severe) as per the severity at the presentation of the case. For comparing the efficacies of the treatments, an efficacy index, based on the total number and the severity of the cases treated successfully and the time to 100 % healing of the wounds, was calculated using the modified formula of Tewari *et al.* (2021):

$$I = \frac{1}{3} \left\{ \frac{(HT_{\max} - HT)}{HT_{\max}} + (N/T) + \frac{\sum(S_i \times n)}{(S \times T)} \right\}$$

where I = efficacy index, S_i = severity of case, n = total number of cases of severity S_i treated

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Table 1. Summary of severity of cases, responses, days to 100% healing, and efficacy indices of the treatments.

Groups	Severity	1	2	3	4	5	Total	Days to 100% healing (HT)	Efficacy index (I)
Charmil Spray	Cases observed	0	3	3	4	0	10	10.00	0.62
	Cases cured	0	3	3	4	0	10		
Brand X	Cases observed	0	4	3	3	0	10	13.75	0.53
	Cases cured	0	3	2	3	0	08*		

*02 animals died during the course of treatment; however, cause of death was neither attributable to the wounds nor to the treatment.

successfully, S = highest possible severity of a case, T = total number of cases assigned to a treatment, N = total number of cases treated successfully with a treatment, HT_{max} = maximum time in days to 100% healing, and HT = Mean time in days to 100% healing.

RESULTS AND DISCUSSION

Delayed and ineffective wound healing accounts for huge economic losses to the livestock industry. The demand for herbal formulations is increasing to overcome such losses, as they are cost-effective and easy to apply with no adverse effect. In the present study, topical herbal spray was evaluated for its efficacy in the management of pocketed wounds in livestock. The group-wise severity of cases at their first presentation, the respective responses to the treatments, days to 100% healing and calculated efficacy indices are summarized in Table 1.

Finding all cases of similar severity is very difficult in a clinical setting, making comparisons between groups with differing number of cases of disparate severity challenging. Therefore, an efficacy index ascribing different weightage for response to wounds of different severity was used for comparing the efficacies of the two treatments. In the calculation of the efficacy index, one-third of the weightage was given to the proportion of total cases treated successfully, one-third to the weighted mean of the severity of the successfully-treated cases, and remaining one-third to the time taken for 100% healing of the wounds. Based on efficacy indices, Charmil® Spray was found to be superiorly efficacious than the popular competitor Brand X for the treatment of wounds in cattle. Charmil® Spray contains active ingredients, including oils of *Cedrus deodara*, *Pongamia glabra*, etc., which account for its superior efficacy over competitor brands. Essential oil of *C. deodara* possess number of bioactive constituents viz. deodarone, atlantone (Shankaranarayan *et al.*, 1977), and himacholone

(Kar *et al.*, 1975) that produce anti-inflammatory, anti-bacterial, fly-repellent, and vulnerary activity (Chaudhary *et al.*, 2011). *Pongamia glabra* has bioactive compounds like pongamol, karanjin, glabrin, pongal, and kanjone (Nadkarni, 1976), responsible for its anti-inflammatory, anti-oxidant, and anti-lipid peroxidative activities (Chopade *et al.*, 2008). Besides, oil creates anoxic environment that stimulates granulation tissue-formation and also compels deep-seated maggots to come out on the surface (Douglas *et al.*, 1977).

In conclusion, a comparison of efficacies of the two formulations included in the present study found effective and faster healing treatment for the management of cases of wound in cattle. A greater efficacy of Charmil® Spray could be attributed to various constituents like oils of *Cedrus deodara* and *Pongamia glabra* that exert antibacterial, anti-inflammatory and vulnerary activity.

Competing Interests

M/s Ayurved Limited, India, manufactures Charmil Spray commercially. BN and BG are employees of *M/s Ayurved Limited*, India. However, the nature of this affiliation did not influence the outcomes of the study in any manner.

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