



Research Article

Epidemiological Investigations on Dermatophytosis in Cattle with Special Reference to Polyherbal Therapy

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ABSTRACT

Dermatophytosis in domestic animals is of considerable economic importance due to its frequent occurrence. The present study was undertaken to investigate epidemiological aspects of the disease and to evaluate efficacy of polyherbal preparation in treatment of dermatophytosis in 32 cattle. Age-wise distribution of dermatophytosis was found to be maximum in 5 to 8 year age group (43.75%) followed by 9 to 12 years (31.25%) and least in cattle of 1 to 4 years of age group (25%). Breed-wise highest incidence of dermatophytosis was recorded in non-descript cattle (59.37%) followed by Red Kandhari cattle (31.25%) and least in Deoni cattle (9.37%). Sex-wise distribution of dermatophytosis revealed cent per cent incidence in males. Out of 32 dermatophytosis affected males, 87.50% were castrated and 12.50% were non castrated one. The characteristic skin lesions were invariably noticed over hump, back and head. Initially erection and thinning of hairs, accompanied by itching and exudation was noticed at the affected site. This was followed by variable degree of alopecia and formation of grayish-white dry crusts at the site. In later stages, thickening of skin with increase in size and number of lesions was observed. The lesions were dry and pruritus was severe. Affected animals were treated with polyherbal spray (Vetomax spray) containing *Panchgun tail, Indradaru* and *Saral*. Out of 32 animals treated, 30 were completely recovered within 60 days indicating 93.75 per cent efficacy. Two animals did not recover even by 60 days of treatment due to irregular treatment. Being aerosol spray, it is convenient for application by the farmer or owner. It also saves the efforts of bringing the animal to the hospital for follow up treatment and has no side effects.

Key words: Cattle, Dermatophytosis, Polyherbal spray, Skin

INTRODUCTION

Dermatophytosis in domestic animals is of considerable economic importance due to its frequent occurrence. Affected animals suffer from constant itching, leading to damage of the skin affecting market value (Chatterjee and Sengupta, 1979). Besides this, it causes stress in animals, weight loss and also drop in milk production in milch animals (Nikookhah *et al.*, 2005) and stunted growth in young animals (McPherson, 1957). The disease bears incredible clinical significance because of wide spread environmental contamination and thereby infection to healthy livestock and risk of an associated zoonotic potential. About 80 per cent of human ringworm may derive from animals in rural areas. Human

trichophytosis may be contracted from cattle and horses, whereas microsporosis more often from dogs and cats (Shaheen, 2005).

Dermatophytosis like chronic skin disease manifested by gray white crusty lesions raised above the skin over head, neck, hump, back etc. and refractive to antiallergic drugs and acaricides has been reported in adult bullocks from Marathwada region (Bhikane *et al.*, 2002). The disease is widespread and it has got tremendous economic importance as it is reducing the market value of valuable bullocks by at least 25 per cent. The laboratory investigations of skin scrapings in affected bullocks were suggestive of presence of dermatophytes and some other fungi in cattle (Satalkar *et al.*, 2006). Therefore, the present study was conducted to know the existence of

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dermatomycosis with special reference to efficacy of polyherbal spray (Vetomax Spray, Rakesh Pharmaceuticals, Kalol, Dist. Gandhinagar, Gujarat, India) in affected cattle.

MATERIALS AND METHODS

Thirty two clinical cases of cattle presented to Teaching Veterinary Clinical Complex, College of Veterinary and Animal Sciences, Udgir and also during work campaigns organized in various villages in Latur district during January 2013 to July 2013 with signs suggestive of dermatomycosis were selected for the therapeutic trial.

Information pertaining to the age, sex, castration status and breed was collected in a specially designed protocol for calculating the incidence of the disease. Detailed history regarding duration of illness, condition of skin and hair coat, commencement of lesions, degree of pruritus, extent of alopecia, progress of lesions, treatment given, response to treatment and relapse of the condition, if any was collected. Blood samples were analyzed for complete blood cell count by using automated haemoanalyzer (Abacus Junior Vet). Skin scrapings collected from the affected area were cultured on Dermatophyte test medium and Sabourauds agar for isolation of fungi. The pure cultures of fungi isolated were confirmed by performing urease test and sugar fermentation tests as per Cruickshank *et al.* (1975).

All the affected animals were treated with polyherbal spray containing *Panchgun tail*, *Indradaru* and *Saral* twice daily for one month or till complete cure. The affected skin site was shaved, cleaned with lukewarm water and dried with clean cloth before initiation of the treatment. Further, the cleaning of the site with lukewarm water on regular basis was advised during course of treatment and following treatments were undertaken. Therapeutic efficacy was determined on the basis of recovery period, recovery rate, subsidence of itching and regrowth of hairs. The treated animals were also observed for toxicity or side effects of these drugs, if any.

Statistical analysis

Data was analyzed using 'Student t test' as per Snedecor and Cochran (1994).

RESULTS

A total of 32 clinical cases of dermatomycosis in cattle recorded during January 2013 to July 2013 were used for calculating incidence in relation to age, sex and breed. Age-wise distribution of dermatomycosis was found to be maximum in 5 to 8 year age group (43.75%) followed by 9 to 12 years (31.25%) and least in cattle of 1 to 4 years of age group (25%). Breed-wise highest incidence of dermatomycosis was recorded in non-descript cattle (59.37%) followed by Red Kandhari cattle (31.25%) and least in Deoni cattle (9.37%). In the present study sex-wise distribution of dermatomycosis revealed cent per cent incidence in males. No case was recorded in female. Out of 32 dermatomycosis affected males, 28 (87.50%) were castrated and 4 (12.50) were non castrated one.

In dermatomycosis affected animals, the duration of illness varied from one month to three years. Initially erection and thinning of hairs, accompanied by itching and exudation was noticed at the affected site. This was followed by variable degree of alopecia and formation of grayish-white dry crusts at the site (Figure 1 & 2). In later stages, thickening of skin with increase in size and number of lesions was observed. The lesions were dry and pruritus was severe. In some cases, excessive hair growth at affected site was also seen.

The first site of lesion was found to be hump (75.4%), followed by back (8.2%), rump (4.9%) and tail (3.3%). In the present study, the site of lesion was hump in maximum number of cases (100%) followed by head (40.63%), back (25%), tail (9.38%) and rump (6.25%). The number of lesions varied from one to ten in individual cases of dermatomycosis in cattle. Single lesion was observed in 18.75% cases, two lesions in 25.00% cases, 3 lesions in 12.5% cases, 4 lesions in 9.37% cases, 5 lesions in 3.12% cases and 6 to 10 lesions in 31.25% cases. In present study, skin lesions were found irregular in general and very rarely circular in shape. The most consistent finding in the present study was the intense pruritus characterized by violent rubbing of affected parts over the hard objects like trees, walls and biting of affected tail and other posterior parts.

Appetite and water intake was apparently normal in almost all affected animals. In general, body condition was not affected except in few cases. Restlessness was observed in most cases probably due to continuous rubbing of the affected part with hard objects.

The isolated species of dermatophytes were *Trichophyton rubrum*, *Microsporum gypsum* and *Epidermatophyton floccosum* (Figure 3 & 4). Non-dermatophytes observed were *Aspergillus niger*, *A. fumigatus*, *A. flavus* and *Fusarium sp.*

Out of 32 animals treated, 30 were completely recovered indicating 93.75 per cent efficacy. Two animals did not recover even by 60 days of treatment. Follow up of all recovered animals by three months showed relapse in 5 animals within 2 to 3 months after discontinuation of treatment. The recovery period varied between 20 to 58 days with an average of 34.09 days. Out of 32 animals treated, 16 recovered by 30 days, 12 by 31 to 45 days and 2 days by 46 to 60 days. In recovered animals, pruritus was reduced by 3rd to 4th day of application and was absent by 8th to 12th day of treatment. Hair growth started within 7 to 10 days and hair coat appeared normal in 20 to 30 days after initiation of treatment (Fig. 5 & 6). Dry crusts were completely reduced in recovered cases.

Haematological observations revealed non-significant changes in haemoglobin (12.07±0.93 versus 10.54±0.34 g/dl), packed cell volume (33.39±2.14 versus 32.33±1.17 %) and total leukocyte count (9.10±0.97 versus 9.45±0.54 × 10³/μl) before and after treatment of affected cattle. Highly significant variations in granulocyte (59.21±5.22 versus 32.86±3.61%) and lymphocytes (37.70±4.98 versus 66.09±3.74%) and significant decrease in monocyte (3.10±0.80 versus 1.04±0.30%) counts before and after treatment of affected cattle were observed (Table 1).



Fig. 1: Photograph showing typical greyish lesions on hump and neck in a R.K. bullock.



Fig. 2: A chronic case of dermatomycosis showing extensive lesions over hump, back and abdomen in a R. K. bullock.



Fig. 3: Fungal colonies isolated from skin scrapings.

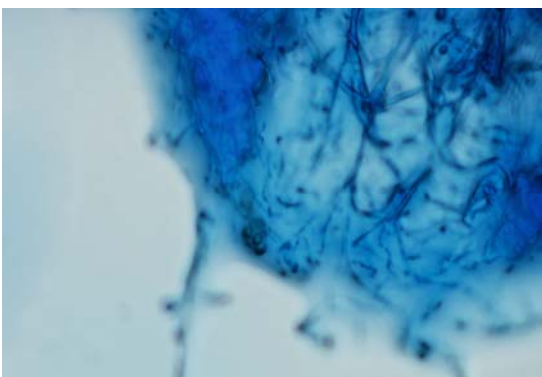


Fig. 4: *Epidermophyton sp.* Isolated from skin scrapings



Fig. 5: Typical lesions on forehead in bullock suffering from dermatomycosis.



Fig. 6: Same bullock after treatment with polyherbal spray

DISCUSSION

Dermatomycosis is the common name given to the diverse superficial infection of keratinized layer of the skin (epidermis) and its appendages (hair fibers) in domestic and wild animals caused by a group of closely related mycelial fungi (Sharma *et al.*, 1991). The disease occurs in all animal species and in all countries but more commonly where animals are housed in close proximity to each other for longer periods (Radostits *et al.*, 2010).

Dermatomycosis in calves in one year age group is common under farm conditions where a large number of calves are usually kept together in yards in close confinement possibly malnutrition helps in the spread of disease besides environmental factors such as temperature, humidity and sunlight (Radostits *et al.*, 2010; Gupta and Singh, 1967). According to Chakrabarti (2003), the higher susceptibility of young animals is due to biochemical changes in skin, skin secretions, physiological and immunological status of the host. However in the present study the affected animals were 1 to 12 year old with maximum incidence in 5-8 year age

Table 1: Haematological values in dermatomycosis affected cattle treated with polyherbal spray.

Sr. No	Parameter	Before treatment	After treatment	t' Value
1.	Hb (g/dl)	12.07±0.93	10.54±0.34	1.55 ^{NS}
2.	PCV (%)	33.39±2.14	32.33±1.17	0.46 ^{NS}
3.	TEC (x 10 ⁶ /µl)	7.68±0.40	6.51±0.17	2.44*
4.	TLC (x 10 ³ /µl)	9.10±0.97	9.45±0.54	0.36 ^{NS}
5.	Granulocytes (%)	59.21±5.22	32.86±3.61	4.29**
6.	Lymphocytes (%)	37.70±4.98	66.09±3.74	5.05**
7.	Monocytes (%)	3.10±0.80	1.04±0.30	2.66*
8.	Platelets	258.31±28.52	204.78±18.84	1.74 ^{NS}

NS – Non significant; * Significant (P<0.05); ** Highly Significant (P<0.01).

group (43.75%). Similarly by Satalkar *et al.* (2006) reported occurrence of the disease in adult cattle from Latur district of Maharashtra. Earlier Borikar and Singh (1994) found equal incidence of ringworm in young and adult cattle from Marathwada.

The highest incidence of dermatomycosis was recorded in non-descript cattle (59.37%) followed by Red Kandhari cattle (31.25%) and least in Deoni cattle (9.37%). Earlier workers have recorded variation in susceptibility of different breeds to dermatomycosis. Namwad *et al.* (2007) reported highest incidence of dermatomycosis in Red Kandhari cattle (4.14%) followed by non-descript cattle (1.28%) and least in Deoni cattle (0.52%). Nooroddin and Dey (1984) recorded higher incidence of dermatomycosis in Sahiwal (15.15%) and Red Sindhi calves (15%) than indigenous (4.42%) and Jersey breeds (2.04%). Pal and Singh (1983) reported that crossbred animals are more susceptible than indigenous animals. The exact cause of breed predilection could not be ascertained in the present investigation. However, Jungerman and Schwartzman (1972) reported that certain individuals or members of particular family or breed may be genetically predisposed.

In the present study dermatomycosis was recorded in male cattle particularly working castrated bullocks. Earlier several workers have reported higher incidence of dermatomycosis in male cattle (Pandey, 1979), male buffalo calves (Nooruddin and Dey, 1984). But Chatterjee and Sengupta (1979) observed no appreciable difference in the distribution of sex. Although exact cause of sex predilection and the occurrence of disease in castrated animals could not be ascertained, the increased susceptibility may be attributed to change in hormonal levels following castration and use of castrated males as working bullocks, which are prone to sweating due to hard work or exposed to warm/hot climate.

In dermatomycosis affected animals, the duration of illness varied from one month to three years suggestive of chronic nature of the disease. Surprisingly skin lesions were found irregular in general and very rarely circular in shape. However earlier workers have noticed typical circular whitish asbestos like lesions in calves. The skin lesions observed in the present study were attributed to fungal invasion of hair fibers resulting in autolysis of the fiber structure and alopecia (Radostits *et al.*, 2010) and release of fungal toxins leading to damage to vascular components which in turn results into effusion of serum (Chakrabarti, 2003).

The lesions were found over hump, head, back, tail and rump. However, the first site of lesion was found to be hump (75.4%) in maximum number of cases. On the contrary, most of the earlier workers have reported commencement of lesions from head and face in calves (Chatterjee and Sengupta, 1979; Edwardson and Andrews, 1979 and Srinivas Rao, 2003). The commencement of lesion invariably from hump observed in the present study might be attributed to constant irritation, injury and sweating caused by yoke over neck and anterior side of hump in working bullocks creating conducive damp atmosphere for lodgment and proliferation of fungi.

Dermatophytes and non-dermatophytes were reported as causes of dermatomycosis in animals. Arun (2000) isolated *Trichophyton verrucosum*, *T. mentagrophytes*, *Penicillium sp.* and *Aspergillus sp.* from cattle. Chahota *et al.* (2000) recovered *Trichophyton verrucosum*, *T. violaceum*, *Mucor sp.* and *Aspergillus sp.* from dermatomycosis affected cattle. Other workers reported *T. verrucosum* (Sharma *et al.*, 1994; Cabanese *et al.*, 1997 and Mpourdzi and Bourdzi, 1996), *T. mentagrophytes* (Thakur *et al.*, 1983 and Sharma *et al.*, 1991) and *T. rubrum* (Chatterjee *et al.*, 1978; Chatterjee and Sengupta, 1979 and Efuntove and Fashnu, 2002) from the cattle suffering from dermatomycosis.

Dermatomycosis can be treated by using various chemical and herbal drugs either topically or systemically. However, topical treatment is more often practiced in animals and systemic therapy is prescribed only in cases of extensive lesions (Shaheen, 2005). Griseofulvin and nystatin are standard oral antifungal antibiotics, whereas amphotericin is an antifungal drug administered by parenteral route. The chemical antifungal drugs like clotrimazole, miconazole, ketoconazole and iteraconazole are used either as solution, shampoos, sprays or ointments (Shaheen, 2005). These allopathic drugs are reported to be effective in the treatment of dermatomycosis. But they are expensive and sometimes, produce allergic reactions and hepatotoxicity (Das and Roy, 1992). The use of indigenous drugs have been recommended as an alternative method due to their nontoxic nature and cost effectiveness (Sharma and Dwivedi, 1990).

The present therapeutic trial revealed recovery rate of 93.75 per cent by 60 days of treatment. Two animals did not recover even by 60 days of treatment probably due to irregular treatment. Follow up of all recovered animals by three months showed relapse in 5 animals within 2-3 months after discontinuation of treatment. The mild and early cases responded quickly to the treatment whereas, chronic long standing cases responded slowly to the treatment probably due to extensive and chronic skin lesions. Progressive reduction in itching and regrowth of hair during treatment suggested antifungal activity of polyherbal preparation.

Earlier, Satalkar *et al.* (2006) evaluated efficacy of polyherbal spray (Topicure spray) containing distillates and extracts of *Cedrus deodara*, *Pinus longifolia* and eucalyptus oil and herbal lotion containing *Indradaru sp.* in aqueous base and revealed efficacy as 80% and 75%, respectively. Namwad *et al.* (2007) used polyherbal spray (Skin heal spray) containing *Cedrus deodara*, *Eucalyptus globulus*, *Pongamia glabra*, *Pinus pongiofila* and *Ocimum basilicum* and polyherbal cream (Dermanol cream)

containing *Eucalyptus globulus*, *Pongamia glabra* and *Cedrus deodara* against dermatomycosis in cattle and recorded recovery rate as 75% and 72.7% respectively.

Conclusion

The treatment of dermatomycosis with polyherbal spray (Vetomax) proved effective. Being aerosol spray, it is convenient for application by the farmer or owner. It also saves the efforts of bringing the animal to the hospital for follow up treatment and has no side effects.

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