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ANTIFUNGAL ACTIVITY OF CINNAMON OIL AND KETOCONAZOLE AGAINST MYCOTIC DERMATITIS IN DOGS

P. Vinu David[1], P.G. Baby[2], M. Mini[3] and P.C. Alex[4]

College of Veterinary and Animal Sciences, Mannuthy, Thrissur

A number of antifungal agents are now available for treating mycotic infections, of which topical agents are comparatively less toxic and easy to apply. Even though modern topical antimycotic preparations are effective, the cost of treatment is very high. Here comes the importance of using a cheap and effective topical antifungal preparation from the locally available indigenous plant *Cinnamomum zeylanicum.*

Materials and methods

Fourteen dogs presented to the University Veterinary College Hospitals with clinical signs suggestive of mycotic dermatitis were divided into Group I and II and utilized for the study. A complete dermatological history followed by a detailed clinical examination was carried out for each case.

Skin scrapings were collected aseptically and subjected to direct microscopical examination using 10 per cent potassium hydroxide solution and lactophenol cotton blue for the presence of fungal spores.

Those clinical cases found positive for fungal spores were confirmed by cultural examination in Sabouraud's Dextrose Agar (SDA) and Dermatophyte Test Medium (DTM). The final identification of the fungi from the clutures in SDA was made by observing its gross colony characters and by studying the

Present address: [1]Research Associate, [2]Associate Professor, [4]Associate Professor and Head, Department of Clinical Medicine, [3]Assistant Professor, Department of Microbiology

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In vitro antifungal susceptibility tests were conducted on the fungal isolates obtained.

For *in vivo* studies commercially available Ketoconazole ointment (Nizral) 2 per cent w/w was used for dogs in Group I and cinnamon oil was used in Group II. Cinnamon oil procured from the Aromatic and Medicinal Research Station of Kerala Agricultural University was used topically after mixing it with glycerine to make a five per cent suspension. Both therapeutic agents were applied twice daily for four weeks.

Results and discussion

Configuration of the mycotic lesions were extremely variable in a majority of the cases whereas all the lesions showed scaliness and alopecia. Lesions were localised in most cases and distributed mainly on head and limbs.

The fungal spores on microscopical examination were found arranged in chains or in irregular masses on the surface of the hair (ectothrix arrangement).

On fungal culture one *Microsporum gypseum* and three each of *Aspergillus* and *penicillum* spp. were isolated from seven dogs of Group I; One *M. gypseum*, one *Trichophyton mentagrophytes* and five *penicillium* cultures were isolated from seven dogs of Group II. Dermatophytes produced a change of colour from yellow to claret red between three and five days after inoculation of skin scrapings in D.T.M. Non dermatophytes also prodced a change of colour of D.T.M. after 14 days of inoculation of skin scrapings.

In vitro studies revealed that all the fungal isolates obtained were highly sensitive to cinnamon oil at a dilution of 1 in 10, followed by Ketoconazole at 20mg concentration.

The zones of inhibition produced by Ketoconazlole at 20mg concentration against *Microsporum gypseum, T. mentagrophytes* and *Penicillium* spp. were 15, 16, 17 and 20 mm respectively. The zones of inhibition produced by cinnamon oil at 1 in 10 dilution against the above fungi were 22, 24, 25 and 35 mm respectively.

In vivo studies in Group I showed complete recovery in five out of seven dogs. Dogs in this group showed clinical improvement from the first week onwards. Four dogs recovered by 21st day whereas one responded by 28th day. The lesions persisted even after the course of treatment for the remaining two non-responsive dogs and *Aspergillus* spp. of fungi was isolated from both these dogs. No fungal spores could be demonstrated microscopically in the recovered animals and there was no growth upon fungal culture.

All the dogs in group II, treated with five per cent cinnamon oil in glycerine showed complete recovery. Animals showed clinical improvement from the fifth day onwards. Five animals responded to treatment by the 14th day whereas two responded by the 21st day. Fungal spores could not be detected on microscopical examination of skin scrapings and no fungal culture was obtained from animals in this group after recovery.

Cauwenbergh *et al.* (1984) noticed that all experimental animals infected with *Trichophyton mentagrophytes* and fifty per cent of those infected with *Microsporum canis* recovered following treatment with 0.5 per cent topical Ketoconazole for 14 days. Medleau and White-Wethers (1992) found that Ketoconazole cream was very effective in treating localized

obtained in this study where five out of seven dogs responded to Ketoconazole therapy. From the two dogs that did not respond *Aspergillus* spp. of fungi was isolated. This agrees with the findings of Sukumar (1996) who reported that *Asperillus* spp. of fungi was resistant to Ketoconazole even at 100mg concentration on *in vitro* studies.

Mnimh (1993) found that the essential oil of *Cinnamomum*spp. applied topically after dilution in a suitable vehicle showed good antifungal property. This concurs with the findings of this study where a hundred per cent recovery rate was obtained against mycotic dermatitis with cinnamom oil diluted in glycerine. Regarding the cost of treatment, each ml of five per cent cinnamon oil in glycerine cost only 45 paise whereas one gram of two per cent Ketoconazole ointment costs four rupees. Thus it can be concluded that cinnamon oil is a very effective and cheap indigenous medicinal preparation for cutaneous mycotic infections.

Summary

Myctotic dermatitis was diagnosed in fourteen dogs using clinical signs, microscopical examination of skin scrapings and fungal culture. Microsporum gypseum, *Trichophyton mentagrophytes, Aspergillus* and *Penicillum* spp. of fungi were isolated. *In vitro* and *in vivo* studies of the antifungal properties of Cinnamon oil and Ketoconazole were conducted. Cinnamon oil was found to be more effective on both *in vitro* and *in vivo* studies.

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