A clinico-epidemiological study of dermatophytoses in Northeast India

Sir,

Dermatophytosis is the superficial fungal infection of keratinized tissue by dermatophytes. Numerous studies on the clinico-mycological aspects of dermatophytoses have been undertaken from different parts of India, but very few studies have been reported on the etiological profile from the Northeast. The present study was undertaken to determine the mycotic profile of dermatophytoses and to observe the socio-epidemiological association.

The study was conducted in the Assam Medical College and Hospital, Dibrugarh, for a period of one year. One hundred clinically diagnosed cases of fungal infections of the skin, hair and nails were included. Patients were evaluated according to a predetermined protocol and history of occupational exposure, trauma and associated factors including socioeconomic status were recorded. Samples were collected, cultured and identified according to standard procedures. Nondermatophytic molds were considered significant only if they were isolated repeatedly (≥ 2 times), in pure culture and with a positive potassium hydroxide (KOH) finding.[3]

The maximum number of patients were found in the age group of 21-30 years (39%) followed by 11-20 years (19%). The male:female ratio was 3:1. The majority (60%) of the cases in this study belonged to the lower middle class (Rs. 20,000-40,000/annum) followed by the lower class (<20,000/annum). Most of the cases were engaged in occupations related to agriculture (39%), followed by students and unskilled laborers (15%). Associated predisposing conditions included diabetes mellitus 11 (11%), eczema 8 (8%), tuberculosis 4 (4%), systemic lupus erythematosus 3 (3%), psoriasis 3 (3%) and leprosy 2 (2%). As for the seasonal occurrence, the percentage of cases had increased during the monsoons. Tinea corporis was found to be the most common (42%) clinical type followed by tinea cruris (11%). Out of the 100 cases, 90 were positive by direct microscopy and 61 were positive on culture. The most common fungal isolate was that of dermatophytes isolated, 96% were anthropophilic and 4% geophilic. The isolation rate of Microsporum gypseum (3.27%) is higher in this study as compared to other studies.[5] Of the species of dermatophytes isolated, 96% were anthropophilic and 4% geophilic. Candida spp. was isolated in 8.19% cases and the isolation rate of candida in this study is comparable to that of other studies.[3] Nondermatophytic molds were isolated from repeated culturing in this study. Repeat cultures were done at weekly intervals and most of the patients were on antifungal therapy from the time of the first isolate. Almost all of these molds were isolated from infections of the nail. The isolation of these moulds have also been reported from various parts of the world from cases of superficial mycosis.[6] Earlier the growth of nondermatophytic molds from skin, hair and nails in culture, were regarded as contaminant. Their emergence as causal agents of superficial mycosis needs evaluation.

In the present study, culture positivity was 61% which is high but comparable to earlier studies.[2] The maximum number of patients were seen to be in their third decade of life with males outnumbering females. Similar findings have been observed in a majority of the earlier studies.[3] Regarding occupational exposure, the majority of the patients in this study were engaged in agricultural work and belonged to the lower income groups. The probable factor put forward for this association includes increased sweating in outdoor activities, constant contact with plants and soil and unhygienic conditions associated with poverty.

The maximum number of cases were reported during the months of August to September when the climate is hot and humid which has also been reported by other workers.[4] The reports published so far in India unequivocally report Trichophyton rubrum to be the most common dermatophyte isolated from various lesions followed by Trichophyton mentagrophytes which is consistent with our study results. The isolation rate of Microsporum gypseum (3.27%) is higher in this study as compared to other studies.[3] Of the species of dermatophytes isolated, 96% were anthropophilic and 4% geophilic. Candida spp. was isolated in 8.19% cases and the isolation rate of candida in this study is comparable to that of other studies.[3] Nondermatophytic molds were isolated from repeated culturing in this study. Repeat cultures were done at weekly intervals and most of the patients were on antifungal therapy from the time of the first isolate. Almost all of these molds were isolated from infections of the nail. The isolation of these moulds have also been reported from various parts of the world from cases of superficial mycosis.[6] Earlier the growth of nondermatophytic molds from skin, hair and nails in culture, were regarded as contaminant. Their emergence as causal agents of superficial mycosis needs evaluation.

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Reducing the allergenic hexavalent chromium in leather to hypoallergenic trivalent chromium for prevention of leather dermatitis

Sir,

Leather is used to make footwear. Chromium is used during tanning to convert putrifiable protein to nonputrifiable protein. Unfortunately, chromium is the most common allergen in leather footwear. [1] As hexavalent chromium can penetrate the skin, [2] it causes allergy although chromium reduced to its trivalent form is less allergenic. If it is possible to reduce all hexavalent chromium in leather to the trivalent form, leather will be less allergenic in a patient sensitive to chromium. Ferrous sulfate has been used in cement, to make the chrome in cement hypoallergenic. [2]

Diphenyl carbazide (DPC) spot test detects hexavalent chromium but does not detect trivalent chromium. [2] We were able to detect hexavalent chromium in leather by using the DPC spot test and then were able to reduce chromium to its trivalent form by using vitamin C.

A small piece of leather was taken and one drop of 2N sulphuric acid (H$_2$SO$_4$) was added. Two minutes later, one drop of DPC was added. Appearance of purple colour [Figure 1] indicated the presence of hexavalent chromium. Two small pieces of the same leather were taken and one piece was placed overnight in freshly prepared 5% vitamin C solution and the other in distilled water. On the following day, the leather pieces were removed and allowed to dry. DPC spot test was done on both the pieces. The spot test was positive in the leather treated with distilled water but negative in the piece soaked in vitamin C [Figure 2] thus confirming that the chromium was reduced to its trivalent form.

However, it is possible that the trivalent form of chromium in leather may re-convert to the hexavalent form if made into shoes. This could be because of heat and sweating or other factors that may operate within shoes. To prove that trivalent chromium is stable once formed, a larger piece of leather made from the hide of cows was obtained and all the tests herein described were performed using the same leather. Six pieces of the leather measuring 5 x 1 cm was taken and three pieces were soaked in vitamin C and 3 pieces in distilled water and allowed to dry as described. Two pieces of leather—one soaked in vitamin C and the other in distilled water were stuck to the inner surface of the heels of two volunteers.

[Figures 1 and 2 are referenced in the text but not shown in the image.]