QUANTITATIVE AND QUALITATIVE STUDY OF BACTERIAL FLORA ON NEURODERMATITIS CIRCUMSCRIPTA

Ashok Kumar Khare and Gurmohan Singh

Bacterial samples were collected from the lesions of neurodermatitis circumscripta and contralateral normal skin by means of modified cup-scrub technique of Patchman et al in eight patients. Bacterial flora at both the sites differed quantitatively and the findings were highly significant statistically.

Key words : Neurodermatitis circumscripta, Bacterial flora.

Microbial flora of dermatitic skin has been studied from time to time. Selwyn and Chalmer[1] demonstrated high prevalence of *Staphylococcus aureus* (*S. aureus*) in eczematous lesions and stressed upon the hospital hazard due to dispersal of bacteria from skin lesions. Subsequently, Leyden et al[2] showed that skin of patients with atopic dermatitis tends to carry more *S. aureus* even without any clinical evidence of infection. Aly et al[3] also found more *S. aureus* on the atopic dermatitic lesions. There may be aggravation or interference in the resolution of the disease due to these bacteria.[4] Wachs and Maibach[5] found that antibiotic treatment wa helpful in impetigenised atopic dermatitis. Although the lesions of neurodermatitis circumscripta (NC) are asymmetrical in contrast to atopic dermatitis but because of the close morphological resemblence and sharing of the common atopic background,[6] we planned to study the bacterial flora on the lesions of NC.

Materials and Methods

Eight patients with NC and contralateral normal skin were studied. Particular care was taken that they have not used any topical drug, systemic antibacterials, corticosteroids, medicated soap or powder for at least 4 weeks before the study was instituted.

From the Section of Dermatology and Venereology, Institute of Medical Sciences, Banaras Hindu University, Varanasi-221 005, India.

Address correspondence to : Dr. Ashok Kumar Khare, Section of Skin and VD, RNT Medical College, Udaipur-313001, India.

Modified cup-scrub technique of Patchman et al, as described by Williamson and Kligman[7] for quantitative and qualitative estimation of cutaneous flora was used. 0.1% triton X-100 in 0.075 M phosphate buffer at pH 7.9 was used as a wash solution. One ml of this solution was put in a cup held on the skin and scrubbing was done by means of a scrubber for 1 minute. It was done twice to collect 2 ml of such solution from a site. Ten fold dilutions of this solution were prepared by means of a diluent (0.05% triton X-100 in 0.0375 M phosphate buffer at pH 7.9). Such dilutions from lesional as well as contralateral normal skin were cultured on separate nutrient agar plates with and without Tween 80, and incubated for 24 hours at 37°C. Bacterial colonies were counted and the bacteria were identified by means of colony characteristics, catalase test and Gram staining. The coagulase test was done on staphylococci.

Results

The number of bacteria per sq cm on the lesional and contralateral normal skin differed significantly. The mean values on lesional and contralateral normal skin were 14351.25 and 965.42 respectively. On applying 't' test, the p value was less than 0.001. Thus the differences in the two sites were very highly significant (Table I).

The bacteria at both the sites were similar. These constituted *S. albus* and lipophilic diphtheroids. None of the sites showed *S. aureus* or Gram negative organisms.

Table I. Comparison of bacterial counts on the lesion and its contralateral normal skin.

Patient number	Bacterial counts per sq cm on the Lesional skin	Contralateral normal skin
1.	1256.27	1099.23
2.	1196.44	897.33
3.	1008.75	1051.37
4.	408.28	455.39
5.	22732.45	2841.56
6.	53391.34	3140.67
7.	34397.78	2991.11
8.	418.76	44.87
Mean	14351.25	965.42

$t=5.51$ df 7

$p<0.001$ (highly significant)

Comments

It cannot be definitely said why the resident non-pathogenic flora were more on the effected site than the control. It is possible that scratching, which is a very important feature of NC led to skin damage and thus loss of barrier function, followed by increased influx of bacteria. The other possible factor is trapping of bacteria secondary to scaling although scaling is a very minor feature in NC unlike atopic dermatitis.

The large number of non-pathogenic organisms on the effected skin is in a way beneficial, as it constitutes the protective barrier. Secondly, there is no special predilection of these sites for pathogenic *S. aureus*. So there is no need to use combination of a topical cortico steroid and an antibiotic in cases of NC, unlike atopic dermatitis. These antibacterials may knock down the barrier layer of resident bacteria and may make the lesion of NC more susceptible to infection.

References

1. Selwyn S and Chalmer SD : Dispersal of bacteria from skin lesions. A hospital hazard, Brit J Dermatol, 1965; 77 : 349-356.
2. Leyden JE, Marples RR and Kligman AM : *Staphylococcus aureus* in the lesions of atopic dermatitis, Brit J Dermatol, 1974; 90 : 525-530.
3. Aly R, Maibach H and Shinefield HR : Microbial flora of atopic dermatitis, Arch Dermatol, 1977; 113 : 780-782.
4. Dahl MV : *Staphylococcus aureus* and atopic dermatitis, Arch Dermatol, 1983; 119 : 840-846.
5. Wachs G and Maibach H : A co-operative double blind study of an antibiotic/corticoid combination in impetigenised atopic dermatitis, Brit J Dermatol, 1976; 95 : 323-328.
6. Singh G : Atopy in lichen simplex chronicus (neurodermatitis circumscripta), Brit J Dermatol, 1973; 89 : 625-627.
7. Williamson P and Kligman AM : A new method for the quantitative investigation of cutaneous bacteria, J Invest Dermatol, 1965; 45 : 498-503.