Abnormal Corneometric Values of Non-lesional Plaque-type Psoriatic Skin

Sir,

Corneometric data reported in the scarce literature available have revealed a difference between psoriatic and normal skin only at the lesional level (1–3), where epidermal hydration is already known to be altered (4).

In studying the usefulness of corneometry in the follow-up of plaque-type psoriatic patients, including lesional, non-lesional and peri-lesional skin, we analyzed the corneometric levels of psoriatic skin as compared to normal skin (1).

Corneometric determinations were carried out on one plaque that had developed recently (two subsequent observations at a 1-week interval) under standard conditions of temperature, humidity and patient preparation (3, 5). The measurements were made at the lesional (internal border), the peri-lesional (1 cm distance from the plaque edge) and the non-lesional (at least 10 cm from the edge) levels. Corresponding body localizations were selected to detect normal skin corneometry in control subjects. Corneometry was obtained by means of a CM 820 capacitance device produced by Courage and Khazaka (West Germany) and data were expressed as conventional corneometric units (CU).

Because of the lack of knowledge of the type of data distribution, the statistical analysis was evaluated with both parametric and non-parametric tests (Anova and Kruskall-Wallis, Student's *t*- and Mann-Whitney tests and, finally, Student's *t*- and Wilcoxon paired tests). When comparing the different involved versus uninvolved plaque areas, the paired tests were adopted.

Table I reports the data observed in 20 plaque-type psoriatic patients (8 males and 12 females; median age = 39 years, range from 20 to 62, median PASI score = 13.9, range 4.8–30.6, free of other clinically evident diseases), compared with 20 normal subjects sharing sex (8 males and 12 females), age (median 40, range 21–61 years) and body localizations of the corneometric measure (back or volar forearm).

The ANOVA and Kruskall-Wallis tests showed significant differences between the four subgroups (lesional, non-lesional, peri-lesional and normal, $p < 0.0001$) (Table I).

The data observed showed that, as expected, the lesional corneometric values were significantly different from peri-lesional, non-lesional and normal levels ($p < 0.0001$).

The peri-lesional and non-lesional determinations were also significantly different from normal skin values (p between 0.0001 and 0.0005, respectively).

The paired statistical comparison between the non-lesional and the peri-lesional corneometric values showed that, although apparently similar, the peri-lesional values were significantly lower ($p = 0.0005$) than the non-lesional ones. It should be noted that the plaque border represents a site of strong change of the corneometric values. In fact, the peri-lesional levels (obtained at 1 cm from the edge) were roughly similar to those observed 10 cm from the edge. In contrast, the corneometric values of the lesional areas (1–2 cm from the inside edge), on the average, were less than half of the non-lesional ones.

Table I. *Corneometric levels of 20 plaque-type psoriatic patients compared with 20 normal subjects*

Group	Area	Corneometric values (CU)			
		Mean ± SD		Median	Range
Psoriasis	lesional	24.8	9.1	25.0	10.0–39.0
	perilesional	61.3	10.1	60.0	41.1–88.0
	non-lesional	64.8	10.9	63.0	41.0–92.3
Controls	–	83.0	10.6	85.2	63.0–102.4

Interestingly, the non-lesional skin was significantly altered with regard to the corneometric values as compared to the control skin, when measured precisely in the corresponding body localizations (7 cases in the volar forearm and 13 cases in the back).

The only similar study available in the literature that reports no corneometric difference between non-lesional and normal skin was carried out on psoriatic subjects in disease remission for at least 6 months and without topical treatment for at least 1 month (1). In addition, the corneometry was only observed at the distal third of the volar forearm. These experimental restrictions could explain the discrepancy observed.

In our experience, 8 patients (4 males and 4 females), observed after 1 month of effective treatment, with disappearance of all lesions, still presented a significant difference in terms of corneometric values as compared with the normal controls (data not shown).

The clear evidence that non-involved skin (with the possible exception of patients with a long-lasting remission) shows abnormal corneometric values, further stresses that all the skin of psoriatic patients may be involved in the disease. This is also supported by other previous findings of our group, where non-involved psoriatic skin showed increased IL-6 and TNF-alpha levels (6). Similar findings have been reported by other groups with regard to some membrane molecules (7).

REFERENCES

1. Berardesca E, Fideli D, Borroni G, Rabbiosi G, Maibach H. In vivo hydration and water-retention capacity of stratum corneum in clinically uninvolved skin in atopic and psoriatic patients. Acta Derm Venereol (Stockh) 1990; 70: 400–404.
2. Serup J, Blichmann C. Epidermal hydration of psoriasis plaque and the relation to scaling. Acta Derm Venereol (Stockh) 1987; 67: 357–366.
3. Carducci M, Mussi A, Bonifati C, Tomaselli R, Onorati MT, Trento E, et al. Correlation of lesional skin corneometry values with serum E-selectin levels and disease severity in patients affected with plaque-type psoriasis. Recovery after effective therapy. J Dermatol 1995; 22: 475–479.
4. Tagami H, Yoshikuni K. Interrelationship between water-barrier and reservoir functions of pathologic stratum corneum. Arch Dermatol 1985; 121: 642–645.
5. Carducci M, Mussi A, Bonifati C, Pietravalle M, Alemanno L, Fazio M, et al. Effect of data normalization for age on the correlations between corneometric values and the serum molecule levels in plaque-type psoriatic patients. Acta Derm Venereol (Stockh) 1997; 77: 110–114.
6. Bonifati C, Carducci M, Cordiali-Fei P, Trento E, Sacerdoti G, Fazio M, et al. Correlated increases of tumor necrosis factor-alpha, interleukin-6 and granulocyte monocyte-colony stimulating factor levels in suction blister fluids and sera of psoriatic patients. Relationships with disease severity. Clin Exp Dermatol 1994; 19: 383–387.

7. Deboer OJ, Verhagen CE, Visser A, Bos GD, Das PK. Cellular interactions and adhesion molecules in psoriatic skin. Acta Derm Venereol (Stockh) 1994; Suppl 186: 15–18.

Accepted November 18, 1996.

Anna Mussi[1,2], Massimo Carducci[1], Claudio Bonifati[1,2], Marcello Fazio[1] and Franco Ameglio[2]*
[1]Department of Dermatology and [2]Laboratory of Clinical Pathology, Istituto S. Gallicano IRCCS, Via S. Gallicano 25/A, I-00153 Rome, Italy.