INVESTIGATIVE REPORT

Factors Influencing the Clinical Evaluation of Facial Acne

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Existing scoring systems for facial acne focus on the lesions themselves, but clinical decisions are based on a general assessment of severity, including the time since onset, the site(s) of involvement, the patient's history, and the response to prior treatments. The aim of this study was to investigate the influence of some of these factors on the global assessment of acne severity. Involvement of the trunk, prior systemic treatment and a positive family history of acne increased the severity score. Inclusion of these factors could help to compose more homogeneous groups for clinical trials. *Key words: prognostic factors; acne vulgaris; risk factors; adolescent; severity of illness index.*

In most clinical trials the severity of facial acne is judged mainly on the basis of the type of lesions (retentional or inflammatory) and their number. Several clinical scoring systems have been proposed:

- Qualitative scales that divide acne into three degrees of severity: minimal, moderate and severe (1–3).
- Semi-quantitative scales that provide a numerical score, generally ranging from 0 to 10 (4, 5).
- Photographic scales (5–7).
- Methods based on lesion counting, either on the entire face or on a predefined zone (8, 9). This last method is considered the most precise, but requires investigator training and is subject to major inter-observer variability.

All these scoring systems focus only on the lesions of facial acne and therefore do not take into account other factors that may influence the severity of acne. Very recently Tan et al. (10) proposed a new severity scale for facial and truncal acne. In clinical practice, therapeutic decisions are based on a global assessment of severity, taking into account not only the number of lesions, their type and their extension on the face, but also other sites of involvement and the patient's history, including responses to prior treatments.

The aim of this study was to investigate the influence of these factors on the global assessment of acne severity, in order to help define more homogeneous patient groups for therapeutic trials.

METHODS

Definition of clinical situations

Five patients with acne of different severities were photographed from the front (Fig. 1).

Four factors with prognostic significance in acne were chosen to define different clinical situations, based on the work of the European Group on Oral Antibiotics in Acne (11):

- The time since acne onset (arbitrarily, more or less than one year previously), thus two different situations.
- Involvement of the trunk (yes/no), thus two different situations.
- Previous treatment (none, systemic excluding isotretinoin, or systemic isotretinoin), thus three different situations.
- The family history (positive/negative), thus two situations.

When these four factors were crossed with one another, they yielded 24 different "clinical situations" (Fig. 2). Thus, each expert viewed each acne patient's photograph 24 times, accompanied by different clinical information. Each situation was then crossed with the photographs of each of the five patients, yielding a total of 120 different clinical situations. To avoid an order effect of the association of severity factors, the factors were randomized independently for each photograph.

Scoring of the clinical situations

These 120 clinical situations were then shown as slides, in random order, to eight dermatologists with special expertise in acne (Groupe Expert Acné, GEA), during a single session. Thus, the 8 experts examined all the photographs at the same time and in the same random order.

The specialists scored each situation on a scale ranging from 0 (no acne) to 10 (very severe acne). The choice of a 10-point numerical scale was based on the idea of increasing the discriminatory power between clinical cases (better with 10 grades than with 5 or 6) and by analogy with Cunliffe's photographic score, which also ranges from 0 to 10 (12). Each photograph was projected for only 30 sec. The scores were noted individually by each dermatologist. No exchange of information with the other dermatologists was allowed. The experts received no prior training in the scoring of acne photographs.

Statistical analysis

Analysis of variance with three variables: the factor studied, the expert, and the photograph was used. The factor-expert interaction was analysed in order to assess the impact of each factor on each

Fig. 1. The five patients with acne of different severity. The photos are published with permission from the patients.

expert's judgement. The "photograph" factor was considered to be random. Adjusted means were calculated for each of the studied factors, for each expert, and for the factor-expert interaction. A model including all the factors and all their interactions was constructed to evaluate the inter-dependency of the factors. SAS software version 9.1.3 for Windows was used for all calculations.

RESULTS

The influence of clinical information on the scores is shown in Fig. 3. The time since acne onset had no significant influence on the scores ($p = 0.14$).

Involvement of the trunk was associated with higher scores (5.28 vs. 4.37; $p < 0.0001$), although only six of the eight experts gave higher severity scores when the trunk was involved.

Prior treatment, whatever its nature, was also associated with higher scores ($p < 0.0001$). Once again, only six experts' scores were influenced by prior treatment status. Compared with no prior treatment, systemic treatments (excluding isotretinoin) were associated with a 0.5-point increment, and systemic isotretinoin therapy was associated with a 1.2-point increment.

A positive family history was associated with a score increment of about 0.3 points ($p = 0.0009$). However, this increase was due mainly to the judgement of a single expert. When this expert was excluded from the analysis, a similar but non-significant trend was found.

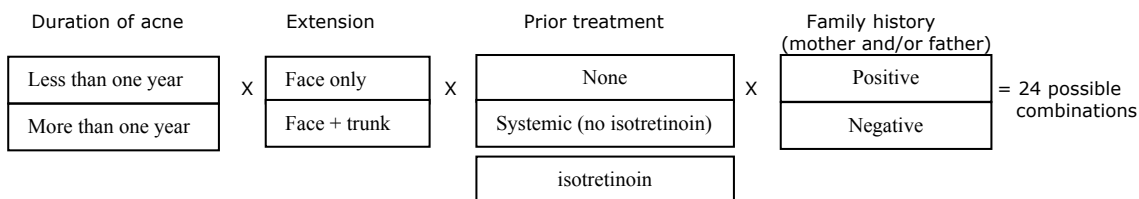The statistical analysis showed that the clinical factors were independent of one another.

Duration of acne		Extension		Prior treatment		Family history (mother and/or father)	
Less than one year	X	Face only	X	None	X	Positive	= 24 possible combinations
More than one year		Face + trunk		Systemic (no isotretinoin)		Negative	
				isotretinoin			

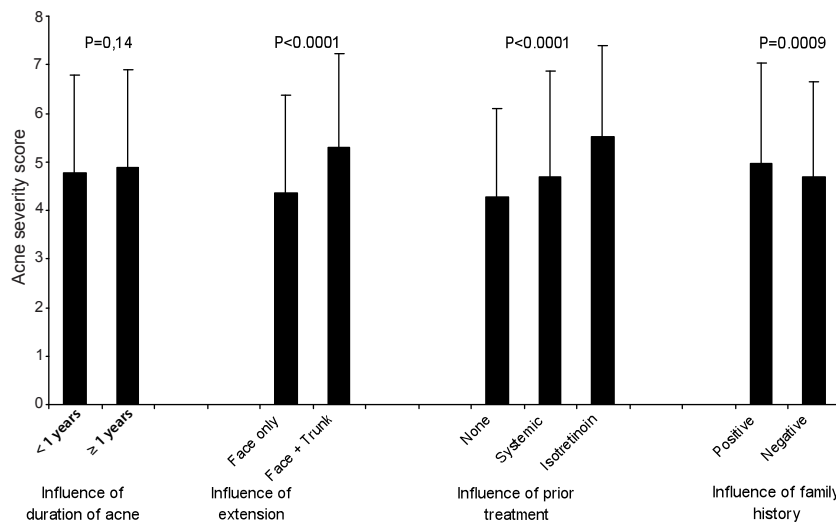*Fig. 2.* Twenty-four different clinical situations.

Fig. 3. Influence of clinical data on the scores (*n* = 960). This number corresponds to 8 experts rating 5 photographs based on all possible combinations.

DISCUSSION

This study confirms that the severity assessment of facial acne can be influenced by several clinical factors. The first is previous treatment, especially with oral isotretinoin, which was the factor most strongly influencing the dermatologists' appreciation. The second is extension to the trunk, and the third a positive family history (the most recently identified prognostic factor (11)). In contrast, the duration of acne did not significantly affect the severity scores, possibly because the arbitrary cut-off of one year was inappropriate. All the factors were independent of one another and were chosen because they had been described as prognostic factors (11–14). One weakness of our study is that each patient was seen 24 times by each dermatologist, possibly influencing the scoring. It appeared that the best way to minimize this bias was to randomize the photographs and to project each for a maximum of 30 sec, allowing the accompanying clinical information to be read. The other weakness could be the use of a 10-point scale, which was arbitrary and unvalidated. However, the use of a 10-point scale was more appropriate to analysis of variance validity than a 3-point score.

The main finding is that dermatologists' judgement of the severity of acne is probably not based solely on the number of facial lesions, but also takes into account the patient's history. Thus, two patients with the same number of facial acne lesions may be categorized and possibly treated differently by the same dermatologist.

In conclusion, this study indicates that some clinical "prognostic" factors can modify expert dermatologists' clinical appreciation of the severity of facial acne. This is probably a source of imprecision and variability in clinical trials, owing to the heterogeneity of the study populations. A larger study is needed to confirm these results, and to determine their practical implications for patient management.

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