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The Applicability of Clinical Scoring Systems: SCORAD and PASI in Psoriasis and Atopic Dermatitis

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The lack of standard systems for assessment of disease severity poses a problem for the introduction of rational quality control in dermatology. The scoring systems often involve assessment of the same aspects of disease, and it may therefore be conceivable that one system could potentially be applied to routine clinical work and form the basis of disease quantification in dermatology. This study was undertaken to compare PASI (Psoriasis Area and Severity Index) and SCORAD (SCOring index of Atopic Dermatitis) scoring systems, to assess disease severity in patients with atopic dermatitis and psoriasis. Patients with psoriasis (14) and atopic dermatitis (14) were scored with both systems, and correlation coefficients and multiple regression coefficients were calculated. A significant correlation between SCORAD and PASI was found ($rs=0.66$). Correlation coefficients were highest ($rs=0.87$) when only atopic patients were studied, and lowest ($rs=0.57$) when only psoriatic patients were studied. Assessments of area and erythema are suggested as candidates for a generalised scoring system for dermatological disease. The results suggest that in spite of the overlap between the two score systems, significant diagnosis-specific differences exist, and neither PASI nor SCORAD is an optimal general dermatological scoring system for disease severity. Additional methodological developments are necessary. ***Key words: quality assessment; methodology; disease severity.***

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The quantification of disease severity is of immense importance to the continuing development of medicine, but in spite of the immediate visibility of dermatological signs the objective quantification of these signs is not easy. A great number of techniques have been developed and applied in more experimental settings, but few, if any, have as yet found their way into routine clinical dermatology (1). This situation differs from the development in other fields of medicine, where sophisticated methods are often routinely used for the objective quantification of disease. This is an important problem for the development of quality control or standard assessments in dermatology.

In lieu of objective measures, scoring systems have been developed for a number of clinical trials, in which double-blinded designs have made explicit and precise determination of disease quantity necessary (2). These methods generally describe only a few clinical parameters: area involved, erythema, induration/oedema and scaling, i.e. the inflamed area. The most frequently used method is the PASI score (Psoriasis Area and Severity Index) (3). Recently a disease-specific scoring system has been developed for use in atopic dermatitis (AD; SCORAD, SCOring index Atopic Dermatitis) (4). The parameters of SCORAD include assessment of inflamed area as well as two subjective historical parameters: itching and loss of sleep. The assessments which constitute the PASI and SCORAD are therefore very similar. Although diagnosis-specific scoring systems potentially offer more precise results, it is not known if the number of parameters used in the scoring systems is so limited that the same results would inevitably be obtained with one general system. Furthermore, standardisation of scoring systems would increase the likelihood of their routine use. This study was therefore undertaken in order to compare the two above-mentioned systems in patients suffering from psoriasis and AD.

MATERIAL AND METHODS

Dermatological patients referred to the National University Hospital for treatment of AD or psoriasis vulgaris were studied. A total of 28 patients were studied: 8 men and 6 women with psoriasis, and 6 men and 8 women with AD. Each patient was examined and the severity of the skin disease was scored using both PASI and SCORAD systems, which are described in detail elsewhere (3, 4). Scoring took place under normal conditions for a clinical examination at the department and in a random sequence, to avoid bias between the two systems. Out-patients were rested before being viewed. In order to eliminate inter-observer-variation and minimise intra-observer variation, all scores were recorded by the same author (GJ).

Spearman correlation coefficients were used to assess the relationship between the two scoring systems. The overall correlation was calculated for all patients, as well as correlations for the two diagnoses separately. The results were assessed by the correlation coefficient and its 95% confidence interval. Furthermore, correlations were calculated for identical parameters scored in both systems to assess intra-observer variation. To establish which of the parameters contributed the most to the diagnosis-specific scores, PASI and SCORAD scores were modified systematically. Data for area, erythema and oedema/induration were removed from the calculation one at a time and new correlations were calculated.

A priori assumptions were made about the results: if either scoring system could be used and a high correlation coefficient was found, we interpreted this as low specificity. On the other hand, a low correlation would suggest a significant difference in clinical specificity, i.e. that one of the two systems was superior.

Ninety-five per cent confidence intervals were calculated for all correlations, and findings were not considered significant if the interval included 0, corresponding to a two-tailed p-value of $p<0.05$.

RESULTS

The mean age of patients with AD was 33.5 years (range 15–74), and the mean age of patients with psoriasis (47.9 years) was significantly higher ($p=0.02$).

The overall correlation (Spearman rank correlation) between PASI and SCORAD scores was significant ($rs=0.66$, 95% confidence interval: 0.38–0.82; $p=0.0001$). The correlation between the scores was also studied separately for the two groups of patients. The PASI-SCORAD correlation was significant for each group by itself (AD patients: $rs=0.87$, 95%

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CI: 0.64–0.96; $p<0.0001$, and for psoriasis patients: $rs=0.57$, 95% CI: 0,06–0.85; $p=0.03$.

The intra-observer correlation was highest for area ($rs=0.94$, $p<0.0001$), while erythema ($rs=0.70$, $p<0.0001$) and oedema/induration ($rs=0.60$, $p=0.0007$) were lower. The correlation between the "residuals" (scaling in PASI, and excoriations, oozing/crusts, lichenification, dryness and subjective symptoms in SCORAD) was statistically non-significant.

Systematic modification of the scores by removal of one parameter at the time and renewed calculation of correlation showed that if area was removed the two systems were still significantly correlated ($rs=0.56$ (95% CI=0.23–0.77), $p=0.002$). A significant correlation was also maintained if the score of erythema was excluded from the calculation ($rs=0.51$ (95% CI: 0.17–0.74). The removal of oedema/induration or "residuals" from the calculation meant that the correlation between the two systems was no longer significant ($rs=0,32$ and $rs=0,17$, respectively).

DISCUSSION

Ideal scoring systems in dermatology should maximise objectivity, be universally applicable, easy to use and very flexible in order to adequately reflect the dynamics of skin changes. Currently no such systems are available. We have compared two commonly used systems to see how useful they are when used in the assessment of psoriasis and AD.

The overall correlation coefficient between PASI and SCORAD scores was significant, but the 95% confidence interval suggests the presence of substantial diagnosis-specific factors. Looking only at patients with AD, we also found a high correlation coefficient between the SCORAD and the PASI scores. Looking only at patients with psoriasis, we found that the scores had a lower correlation coefficient. In view of our a priori assumptions, this suggests that either system may be used with a limited loss of information in AD, while the two scoring systems do not appear mutually interchangeable in psoriasis. In the absence of recognised objective criteria for disease severity, the data do not allow any conclusions about which system is superior in the assessment of psoriasis.

Intra-observer variation was low except for "residuals", where no significant correlation was found, as expected. Studies of modified PASI and SCORAD scores showed that only the removal of "residuals" and oedema/induration showed a low correlation between the two systems. The observation suggests that area and erythema are the most general components of both scoring systems, and that clinical assessment of oedema/induration is less useful in general assessment. It is suggested that a general scoring system for inflammatory skin disease should contain scores for area and erythema. The "area" has previously been speculated to be the most important factor in the assessment of dermatological disease (5).

No scoring system can represent the complete truth. By nature, scoring systems are only an aid to systematic description and subjective evaluation by the physician. Absolute data, such as biochemical investigations or clinical findings, which are not included in the particular scoring system may therefore be lost, but little or no information is lost when scoring systems are compared to each other, particularly where no recognised objective measures exist. Both PASI and SCORAD contain diagnosis-specific components which may account for inaccuracies when used for general assessment of dermatological diseases. Our findings indicate that neither of the two scoring systems studied is generally applicable in spite of their similarities. Additional methodological developments are therefore needed in order to establish a more general dermatological scoring system, which will allow quantification of skin diseases in a routine clinical setting.

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