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CLINICAL REPORT

Clinical Scoring of Cutaneous Mastocytosis

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There are still many controversies in defining and evaluating mastocytosis. One of the aspects that is missing is a system for clinical evaluation of mastocytosis of the skin. A calculation based on a semi-quantitative analysis of three aspects of mastocytosis was designed. The method is called the scoring index of mastocytosis (SCORMA). The clinical use of SCORMA is advocated. ***Key words: mast cell disease; skin; SCORMA.***

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Mastocytosis is a rare and heterogeneous disease, which is characterized by an abnormal accumulation of non-malignant mast cells (1–3). Usually symptomatic skin involvement is present and is either localized or diffuse (2). Dermatologists may encounter new cases of mastocytosis at a ratio of one in every 1,000–8,000 new patients (3). Bone marrow involvement can be observed in most of the adult patients (4, 5). Despite rapidly growing knowledge, there are still many controversies in defining and evaluating mastocytosis(6–11). Because there is no system for clinical evaluation of mastocytosis of the skin, we designed a method for quantifying and scoring mastocytosis. The method is called the scoring index of mastocytosis (SCORMA). Details of SCORMA and an evaluation of its application by a panel of dermatologists are presented in this report.

MATERIALS AND METHODS

SCORMA

A semi-quantitative analysis of three aspects of skin mastocytosis was made using the same principles of the "SCORAD" for atopic dermatitis (12–15).

The analysis was divided into 3 parts. In the first part (A) the extent of the skin involvement was assessed. In the second part (B), the activity of the lesions was estimated, and in the third part (C), the subjective symptoms were recorded. Each part was rated separately on a semi-quantitative scale. The combined scores of A, B and C formed the SCORMA index.

Part A. There is a substantial variety in skin lesions in the cutaneous manifestation of mastocytosis. Using a pencil, the extent of the disease is estimated by roughly marking the contours of the skin abnormalities in the picture printed on the SCORMA form (Fig. 1). Thereby, the difference in morphology of the variation in presentations of skin mastocytosis is minimized. The percentage of skin involvement is represented by the marked surface. In the SCORMA setting there are two assumptions. In the case of solitary mastocytomas, each lesion represents 1% skin involvement. In the case of diffuse cutaneous mastocytosis, by definition the skin is completely involved (100%).

Part B. The pattern of the local reactivity of the skin lesions is limited to erythema, swelling and blistering of varying degrees. This may occur spontaneously or be caused intentionally by rubbing the skin lesion (Darier's sign).

In assessing mastocytosis, the activity of the individual mast cell is probably reflected by the activity of the skin lesions. This is exemplified by the observation that, in resolving mastocytosis, reactivity to various stimuli decreases a long time before resolution of the associated hyperpigmentation. Subsequently, it is our opinion that assessing the activity of the lesions provides a close impression of the actual local state of the disease activity. Reduction of mediator-induced symptoms owing to a decrease of degranulation is always established in treatment that is considered successful. The relevance of looking at the lesional activity is therefore evident.

The activity of the disease is measured by one elected lesion. The chosen lesion should be typical in shape, size and colour for the majority of the skin lesions. A lesion on the back of the trunk may be chosen because of the limited exposure to UV radiation from sunlight. Secondly, non-lesional skin will be present close to the lesion. This is used to assess dermographism due to rubbing of unaffected skin.

Four items of the chosen lesion are scored semi-quantitatively: pigmentation/erythema, vesiculation, elevation and Darier's sign (Fig. 1). The score for each item is 0–3. In total, the range of the score is 1 to a maximum of 12.

Part C. In mastocytosis, many patients lack symptoms such as itching or flushing, but they complain about the adverse cosmetic aspects of their disease. Occasionally, patients are restricted in their daily activities because of severe constitutional symptoms caused by mediators released upon mast cell degranulation. Scoring subjective complaints involves a certain degree of inaccuracy caused by the patient's mental state. Subjective complaints were included in the SCORMA index, but have only a limited influence on the final score.

The subjective symptoms prior to consultation were evaluated. A period of 3 weeks was chosen in order to gain an impression of the persistent nature of a given complaint. A shorter period of observation would increase the risk of including non-specific complaints or symptoms of a transient nature, while a longer period of observation would exclude the possibility of evaluation of the effect of therapy on a shorter interval. However, until data are available on the duration of symptoms in mastocytosis, these cannot be included as complaints that are likely to be caused by mastocytosis. Five questions were put to the patient. Question 1 dealt with the daily inconvenience caused by this disease. The remaining questions dealt with specific symptoms caused by mediator release or mast cell accumulation. The severity of the symptoms was scored from 0 to 10. A visual analogue scale was used in children older than 4 years of age. The score ranged from 0 to a maximum of 50.

Formula for calculating SCORMA index

It was our intention to develop a semi-quantitative clinical index to monitor the effect of therapy on skin mastocytosis. We have assumed that the lesional activity was a reflection of the potential degranulating activity of all the mast cells. Consequently, during the course of the disease and treatment, increase or decrease in the lesional activity is probably the first objectively measurable item to change. The SCORMA index was intended to be sensitive for monitoring changes

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during the course of the disease. Emphasis was therefore put on lesional activity by multiplying it by a factor of three as compared with extent of complaints and subjective complaints. The multiplication factor 3 for lesional activity was chosen in analogy with the SCORAD (12–15) used in atopic dermatitis.

The resulting scores of each item are incorporated in the SCORMA index formula: A + 3B + C.

In order to use the SCORMA index formula: A + 3B + C, the ranges of the scores of A, B and C were equalized to 20. This was done by dividing A by 5 (maximum outcome: 100/5 = 20), multiplying B by 5/3 (maximum outcome: 12 × 5/3 = 20) and multiplying C by 2/5 (maximum outcome: 50 × 2/5 = 20). Finally, the score of B is multiplied by 3. The SCORMA index formula in practice is A/5 + 5B + 2C/5, and ranges from 5.2 to 100.

We assessed whether the SCORMA index also has practical value for dermatologists not involved in basic research programmes on mastocytosis. The reliability of the SCORMA index was determined by measuring the inter-rater agreement on all the items of the SCORMA index. Secondly, the severity of the disease calculated as the SCORMA index was compared with the dermatologists' assessment on severity. The assessment of the severity was documented on a 0–100 scale for each patient separately prior to revealing the SCORMA index calculation.

In 1998, 9 dermatologists were invited to participate in a course to evaluate 9 patients (6 boys and 3 girls) with mastocytosis using the SCORMA index (Fig. 1). The SCORMA index of all the patients is shown in Table I.

All relevant clinical information was provided by a slide presentation of an overview of the skin as well as close-ups of the lesional skin.

None of the dermatologists had information on the SCORMA index formula prior to the course. The data were processed and calculated using SSPS. For all patients and all parts, statistical analysis was made including the inter-investigator variations expressed as inter-rater agreement for each patient (16, 17). The degree of agreement is expressed as the proportion of the possible scope of doing better than by chance. A value between 0.41 and 0.60 is considered moderate, between 0.61 and 0.80 as good and between 0.81 and 1.00 as very good (16, 17).

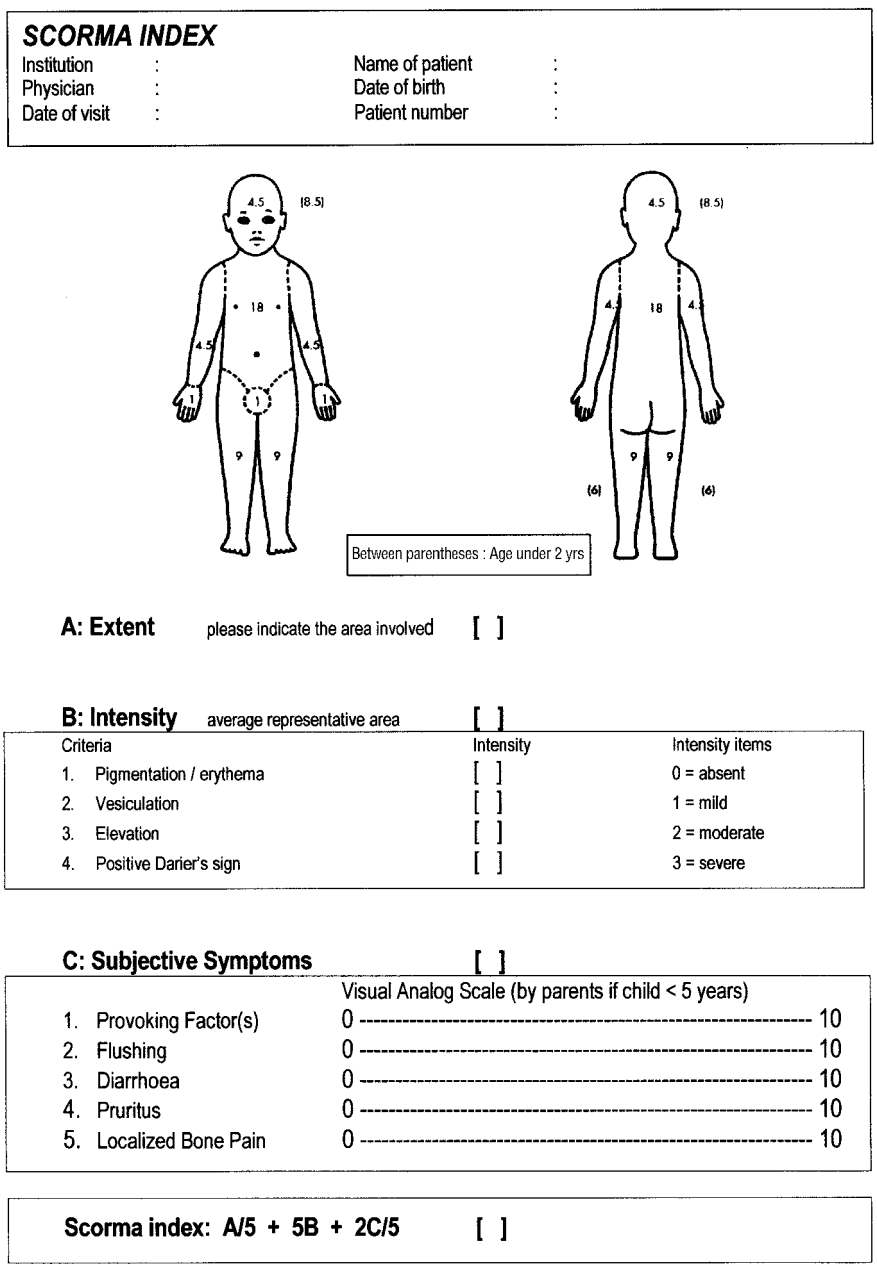

Fig. 1. The scoring index of mastocytosis (SCORMA).

Table I. *Assessment of the severity of mastocytosis by 9 dermatologists in each patient (mean ± SD)*

Patient	Diagnosis	Extent score	Intensity score	SCORMA index	Dermatologist's global evaluation (scale 0–100)*
1	UP	21 ± 14.2	2.4 ± 0.8	19.8 ± 5.4	21.1 ± 12.2
2	SM	1 ± 0	3.6 ± 0.7	20.6 ± 3.5	10.4 ± 7.9
3	UP	17.2 ± 3.8	3.6 ± 0.5	21.4 ± 2.8	19.2 ± 5.9
4	UP	44.1 ± 10.7	2.8 ± 1.0	29.6 ± 6.8	47.8 ± 17.2
5	UP	31.4 ± 7.2	3.4 ± 0.8	30.5 ± 4.7	44.4 ± 17.2
6	UP	52.4 ± 10.9	3.8 ± 0.9	30.7 ± 5.0	51.7 ± 16.4
7	UP	70 ± 9.7	4.6 ± 0.5	37 ± 2.8	69.4 ± 9.2
8	DCM	100 ± 0	3.6 ± 1.2	42 ± 12.3	74.9 ± 12.3
9	DCM	100 ± 0	10.6 ± 1.3	78.6 ± 6.3	92 ± 8.3

UP = Urticaria pigmentosa; SM = solitary mastocytoma; DCM = diffuse cutaneous mastocytosis.
*Impression prior to SCORMA.

RESULTS

The means and standard deviations for the extent of skin involvement for all the 9 patients are listed in Table I. Note that for patients 2, 8 and 9 there is a unanimous assessment. These patients had a defined percentage of skin involvement; 1% for solitary mastocytoma (1 pat.) and 100% for diffuse cutaneous mastocytosis (2 pats.).The mean results show less variety for activity than for extent. This can be explained by the limited width in range for part B.

There was a high degree of inter-rater agreement for all the investigated items, for parts A and B and the outcome of the SCORMA index. The lowest value, 0.43, was noted in subsection B1 (erythema).

The results of the SCORMA index compared with the results of the global evaluation of dermatologists before disclosing the SCORMA formula are also presented in Table I. The two assessments differ in the degree of severity in 7 of the 9 patients. In 4 of those patients the severity was assessed as more than 50% higher by the dermatologists than by the SCORMA index.

DISCUSSION

Mastocytosis is characterized by an indolent or progressive disease. In the majority of cases, mastocytosis is manifested by skin symptoms. In patients with a high suspicion of mastocytosis, histopathological examination of the bone marrow or other organs may be necessary to establish the diagnosis in cases in which histopathological examination of the skin showed no abnormalities. Measurement of mast cell mediator metabolites, such as N-methyl histamine and protryptase, is valuable in staging mastocytosis. However, these measurements have no diagnostic significance, because numerous other conditions may also lead to elevated levels.

No standardized protocol has been published for clinical monitoring of mastocytosis. Likewise, there is no scoring system to monitor symptomatic therapy, either routine or experimental.

We developed a clinical scoring system to monitor the cutaneous symptoms of patients with proven mastocytosis. The method is simple, which makes it reproducible. It imposes no burden to the patient. This method provides standardized information on the extent and the activity of mastocytosis in the skin. It is applicable alone or in combination with other staging investigations. In daily practice, it may prove valuable because it quickly provides a point of reference for the doctor and the patient.

The SCORMA index calculation contains a factor three-weight advantage for lesional activity over extent of the disease and subjective complaints. Consequently, emphasis has been put on the items of mastocytosis of the skin that are likely to be the first features that undergo change in progressive disease as well as in subsiding disease. It serves the goal of monitoring changes in mast cell activity and, to a lesser degree, to monitor changes in subjective aspects of the disease and pigmentation.

At our clinic, many of the mastocytosis patients are enrolled in therapeutic trails for which we use the SCORMA index as well as measurements of several mast cell mediator metabolites. Correlation studies between reduction of the SCORMA index and mediator metabolites are being pursued.

In order to gain insight into the reproducibility of the SCORMA system, it was put to the test by 9 practising dermatologists at regional hospitals. Based on the results of the assessment of 9 patients, a very high degree of agreement was achieved when the SCORMA index was used, even without prior familiarity with the method. Therefore, it also has practical value when used incidentally. The results of the SCORMA index compared with the dermatologists' opinion on the severity of the disease differ with respect to the extent of the disease. In general, patients with a relatively high percentage of involved body surface were considered to be more severely affected than those who had a lower percentage of involvement, the latter, regardless of the activity of skin lesions. This indicates further that standardized observation using the SCORMA index of the skin in mastocytosis could provide a more accurate clinical description of the activity of the disease.

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