

Assessment Methods in Vitiligo

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Natural course of vitiligo include flares, remissions and spontaneous repigmentation. Knowledge of the initial extent and severity of vitiligo is essential for making prognoses and therapeutic choices and is also fundamental to the evaluation of treatment efficacy. In a systematic review on randomized controlled trials of interventions for vitiligo, over a period of forty three years, numerous outcome measures were identified. Of the fifty-seven included studies, none of the studies used exactly the same method of scoring [1]. In another systematic summary of fifty-four randomized controlled trials on vitiligo treatment outcomes it was found out that at least twenty-five different outcome measures were used [2]. The majority of these trials defined the primary outcome as repigmentation and even repigmentation was measured by forty-eight different scales in these trials [2].

This table is a summary of all current methods that we can use to assess vitiligo patients. As you see there are plenty of different methods. Most methods used in clinical practice are based on visual assessments by the physician and/or analysis of photographs taken before and after treatment under visible or ultraviolet light. However, these methods are very subjective. More objective and precise methods that can be used to assess depigmentation in reference lesions are the point counting method and digital image analysis systems score. Digital image analysis systems are all commercially available morphometry-based image analysis software that we can use for planimetric measurement. However, for the evaluation of widespread vitiligo lesions, these techniques are time consuming. Furthermore specific devices and software are needed for the assessment. We can also use colorimetry-based image analysis, spectrophotometry and more modern methods like reflectant confocal microscopy.

Over the past several years, different scoring systems have been proposed for vitiligo to assess the severity, response to treatment and to evaluate the activity and the potential of repigmentation (Table 1). In this article, Among the scores designed for the assessment of vitiligo, I will try to summarize the ones that are easily accessible and practical for use in wide spread vitiligo patient.

The Vitiligo Area Scoring Index (VASI) is a validated quantitative scale developed by Hamzavi and coworkers [3]. It was initially developed to measure the response of vitiligo to narrowband ultraviolet-B treatment, but has since been used to evaluate various vitiligo therapies. In this assessment, the patient's body is separated into five regions: the hands, upper extremities (including axillary regions), trunk, lower extremities (including inguinal regions and buttocks), and the feet. Subsequent studies have added a sixth site: the head/neck area. The percentage of vitiligo involvement for each body region is calculated by using the palmar method. The palmar method uses the palmar surface area of the patient's hand as an estimation guide and defines the surface of the patient's hand including fingers to be 1.0% of the total body surface area. Each site is then clinically evaluated by visual assessment for the pattern of skin depigmentation using a visual scale. Pattern of depigmentation are illustrated with a descriptive atlas of patient photographs in the article, the extent of residual depigmentation is expressed by the following percentages: 0, 10%, 5%, 50%, 75%, 90%, or 100%. At 100% depigmentation, no pigment is present; at 90%, specks of pigment are present; at 75%, the depigmented area exceeds the pigmented area; at 50%, the depigmented and pigmented areas are equal; at 25%, the pigmented area exceeds the depigmented area;

at 10%, only specks of depigmentation are present. The VASI is then derived by multiplying the values assessed for the vitiligo involvement by the percentage of affected skin for each body site and summing the values of all body sites together.

$$\text{VASI} = \sum [\text{HAND UNITS}] \times [\text{RESIDUAL DEPIGMENTATION}]$$

Hamzavi et al. assessed the validity of the VASI in 22 patients by comparing the VASI with the physician global assessment and founded that VASI is a valid quantitative clinical tool that can be used to evaluate vitiligo parametrically [3].

Another scoring system is Vitiligo European Task Force (VETF) assessment. This is a more complex system. It has been developed by a European group [4]. VETF evaluation system seeks to add more specific parameters to the quantitative measurement of depigmentation. Indeed, it assesses the three dimensions of the disease (extent, staging and spreading/progression), and so provides three different values. Similar to the VASI assessment, the body is also separated into five different sites, specifically the head/neck, trunk, arms, legs and hands/feet. Extent is based on rule of nines, already used in atopic dermatitis. For the calculation of extent of vitiligo hands and feet are included in evaluation of extent in arms and legs. Staging is based on cutaneous and hair pigmentation in each body region except hands and feet, which are assessed separately and is assessed using grades from 0 to 4 on the largest macule. A proposal was made for simplifying the staging scale: stage 0: normal pigmentation (no depigmentation in area graded), stage 1: incomplete depigmentation (including spotty

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| VISUAL ASSESSMENT |
| • PHYSICIAN'S GLOBAL ASSESSMENT |
| • VISIBLE LIGHT PHOTOGRAPHY |
| • UV LIGHT PHOTOGRAPHY |
| VITILIGO AREA SCORING INDEX (VASI) [3] |
| VITILIGO EUROPEAN TASK FORCE assessment (VETF)a [4] |
| POINT-COUNTING METHOD [5] |
| VITILIGO DISEASE ACTIVITY SCORE (VIDA SCORE) [6] |
| POTENTIAL REPIGMENTATION INDEX (PRI) [7] |
| VITILIGO EXTENT TENSITY INDEX (VETI) [8] |
| DIGITAL PLANIMETRY |
| • IMAGE PRO PLUS 4.5 |
| • AutoCad 2000 |
| • PHOTOSHOP |
| • COREL DRAW... |
| REFLECTANCE TRISTIMULUS CIE COLORIMETRY |
| SPECTROPHOTOMETRY |
| REFLECTANCE CONFOCAL MICROSCOPY |

Table 1: Assessment methods for the evaluation of vitiligo.

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depigmentation, trichrome, and homogeneous lighter pigmentation) stage 2: complete depigmentation (may include hair whitening in a minority of hairs, <30%), stage 3: complete depigmentation plus significant hair whitening (>30%). "Spreading" was introduced in this system to include a dynamic dimension, since rapidly progressive vitiligo needs urgent intervention to stabilize the disease. To assess spreading, on a simple scale (+1: progressive; 0: stable; -1: regressive), it is recommended to look at the patch limits first using natural light and to compare this with Wood's lamp limits. Finally, each site is clinically evaluated for the extent of vitiligo involvement, the staging and the spreading of vitiligo. Assessment on spreading and staging is based on examination of the largest macule in each body area [5,6].

A disadvantage of the VETF assessment and the VASI is that both instruments are semi-objective. On the other hand, while these two systems differ in their approach and outcomes, both are well described, easy and quick in use specifically in widespread vitiligo. Also, recently, both are found to be reliable and responsive instruments to assess the degree of depigmentation in vitiligo [7-9].

It's also important to assess whether vitiligo is stable or progressive, because the management strategies differ in each case. Vitiligo disease activity (VIDA) score is a six-point scale for evaluating vitiligo activity. It is based on patient's own reports of disease activity. VIDA score was used in the study of Njoo et al. at 1999, for the first time. In this score grading is based on disease activity and time period. Grading is as follows; VIDA score + 4: -activity lasting 6 weeks or less; score +3: activity lasting 6 weeks to 3 months; score 2: activity lasting 3-6 months; score 1: activity lasting 6-12 months; score 0: stable for 1 year or more; score -1: stable with spontaneous repigmentation for 1 year or more. A low Vitiligo disease activity score indicate less vitiligo activity.

Example of developed, although not validated another instrument, to evaluate the potential of repigmentation is the Potential Repigmentation Index (PRI). This index is recently developed by Benzekri and coworkers for prediction of potential repigmentation in non-segmental vitiligo. They show that the PRI is significantly correlated with repigmentation in patients treated with Narrowband-UVB [7]. The patients with higher PRI were more prone to obtain higher pigmentation in their study. For the calculation of the index, each lesion exceeding ten centimeter square was classified according to the system proposed by the authors based on the relationship between the clinical type of vitiligo and the remaining melanocytes from the

follicular and epidermal reservoir (four types of lesion; A, B, C and D). PRI is then calculated for every patient by establishing the ratio between the number of lesions with an expected good response rate (type A + type B) and the number of usually refractory lesions (type C + type D). Thus, $PRI = (type\ A + type\ B) / (type\ C + type\ D)$. PRI is a predictive index for repigmentation; it is not a numerical index for measuring the extent and severity of vitiligo.

To summaries; there are a large number of different approaches for the assessment of the disease severity and treatment response; and currently there is a lack of consensus in the methods of assessment used in clinical trials and daily practice. For the moment it is difficult to compare the efficacy of different treatment modalities, because measurement of repigmentation is not standardized.

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