Severity Assessments In Psoriasis: Review of Applicability and Possible Challenges That May Arise In West African Population

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ABSTRACT

Severity assessment form vital part in management of chronic disorder in the aspect of monitoring and research. Psoriasis is a chronic inflammatory disorder of the skin that presents with well demarcated scaly plaques. Its diagnosis has increased in dermatologic clinics of our region in recent times compared to previous documentation of its rarity. With this recent experience of increase in diagnosis, severity assessments become necessary. However, the are many severity assessment tools developed for this disorder many of which were developed using fair-skinned individuals in which the disease is more prevalent and there is a challenge of which one is most adaptable and applicable for use in our skin type. Unfortunately, there have been very few studies on psoriasis and severity assessment in view of previous experience of its rarity. We therefore decided to introduce the available severity tools for psoriasis, document the possible challenges that may arise in their use as well as encourage the need for a research in determining the most applicable method in estimating psoriasis severity in our skin type.

Introduction

Psoriasis is a chronic inflammatory skin disease characterized by well demarcated plaques with erythematous hue and overlying silvery scales. It is a very common disease in Western population occurring in about 2-3% of their population.(1-3) However, the disease is relatively less common in our environment. It was initially reported to be rare in earlier reports with documented prevalence reports of 0.05%, 0.09% and 0.3% in Mali, Nigeria and Angola respectively(4-6) but more recent data showed it as one of the common inflammatory skin disorder seen in Nigerian dermatology clinics with prevalence of 1.1 – 1.4%.(7, 8) The reason for the increase over the years is not certain but can be linked to either increase in awareness, hence recognition of the disorder or a true increase in the occurrence of the disease.

The lesions of psoriasis occur mostly on the extensor parts of the limbs but there is individual variation in lesional morphology, extent of the disease and body sites involved. Thus, reliable assessment of severity of the disorder is essential for follow up and to document treatment responses in clinical research and clinics.

Various severity assessment has been developed and tried such as Body Surface Area (BSA), Psoriasis Area and Severity Index (PASI), Self-Administered Psoriasis Area and Severity Index (SAPASI), Physician Global Assessment (PGA), Lattice System Global Assessment, Copenhagen Psoriasis Severity Index, Salford Psoriasis Index, photographs e.t.c but each has identifiable advantages and limitations in their applicability. Sometimes, these are combined to increase their sensitivity and efficacy for instance the PGA and BSA.(9, 10) However, amongst all these tools, PASI can be rated as the most universally acceptable tool for severity measurement as it is the most used in clinical research and trials. Because of this wide acceptance, many authors prefer to choose it for easy comparison with other results, hence, it can be referred to as the "gold standard". It is however worthy of note that majority of the above severity tools were developed and used mostly in Caucasian population in which the disease is more prevalent but applicability and data on native West African population are very few to absent. Additionally, lesions of psoriasis may show slight variation in presentation in skin of color compared to Whites. (11, 12) Psoriatic lesions presents with different shades of pigmentation making erythema to be less conspicuous. Other identified differences

in clinical presentation are increased post inflammatory hypo- or hyperpigmentation(13, 14) and alteration in lesion as a result of local therapies applied before dermatological consultation is being sought.(12)

In view of the increased frequency of this disorder especially in our clinics, a consistent and correct assessment of severity for the purpose of grading, clinical trials and or follow up becomes an issue of vital importance. We therefore decided to do a brief review on each of these severity assessment tool highlighting the advantages and limitations to its use in our environment so that researchers can be more aware and data on severity measurements can be uniform.

1. Percentage Body Surface Area (% BSA):

This is done by estimating the total skin surface area affected in percentage using the rule of nine for adults or palms (1%) for children. The severity of the disorder is measured by estimated percentage and it is thereafter classified as localized if percentage BSA is 10% or below or generalized if greater than 10%. Validity has been tested with other tools such as PGA with strong correlations found. (15) In contrast to the varying inter-rater reliability, the intra-rater reliability for area estimation was described as excellent.(16-18) The use of this tool is simple with excellent intra-rater reliability but may be faced with some inter-observer difference and difficulty getting an accurate estimate when the lesions are small and diffusely dispersed giving a place for possible overestimation in such circumstances. BSA estimation seems an inappropriate tool for follow up as previously estimated area might not have changed significantly considering the post-inflammatory dyspigmentation that develops usually in our population. It also does not put into consideration the different characteristics of the lesions such as thickness, scaling as well as location therefore making it non-holistic as a severity tool. For instance, a South African study demonstrated sensitive / exposed sites such as the head / neck, genitalia / groin and hand / foot when involved contributed significantly to a more impaired quality of life than when they are not involved.(19)

2. Physician Global Assessment (PGA):

This is an overall approach of estimating the severity of lesions based on the physician's assessment of the degree of erythema, scaling and thickness. The physician afterwards classifies them into almost clear, mild to very severe categories (Fig.1). It is fast to use and seems to be the second most common clinical severity tool for psoriasis. PGA aims at assessing the overall severity and has been documented to have reliable and substantial correlation with PASI and health-related quality of life psoriasis assessment too, (20, 21) but challenged by inter-observer variability (22) and neglect of extent of lesion. It is also worth noting that patients with psoriasis might present with lesions at different stages in the same region or different parts of the body thereby making the assessment confusing and a little inaccurate for follow up. For instance, a patient might present with what looks like a mild lesion on the lower limb but has severe lesions on the scalp there by making it inaccurate to classify the patient either as a mild, moderate or severe disease keeping in mind that mild severe disease is confusing. It is also difficult to know which regions had significantly improved at follow up visits as the assessment gives an overall estimate of all body parts.

3. Psoriasis Area and Severity Index (PASI):

First introduced in 1978 in studies on systemic retinoids in psoriasis,[-23] it has taken the lead as the most commonly used clinical severity tool and outcome measure in Psoriasis. In PASI scoring system, the whole body is divided into four regions; head, upper limb, trunk and lower limb with each region representing 0.1, 0.2, 0.3 and 0.4 fraction of the whole body respectively. A score is generated by assessing, scoring and summing the degree of erythema, scaling and thickness as well the percentage area of involvement in each region (Fig. 2). This generates a severity score that has a maximum score of 72 and minimum of 0. This is the most common severity tool used in research and clinical trials thereby making comparison of results easy. It has an added advantage of assessing the typical characteristics of psoriatic lesion in a regional method thereby reducing lesional

variation in severity in a single individual. Lastly, it can help identify the efficacy of each drug on the different lesional characteristics as a way of identifying future drug combinations to increase effectiveness. There has been a lot of interest in PASI as a result of its frequent usage and this has led to several modifications to make its use easier including development of electronic application/automated computer guided measurements on fair skinned individuals and studies has shown their precision to be comparable to those of trained physician. (24, 25) This will definitely give the tool the additional benefit of wider accessibility, faster and simpler handling in the nearest future.

Although, studies on PASI in African population are scanty, the tool is not without limitations; it is cumbersome to use, less sensitive in mild cases, may be time consuming therefore making it inapplicable in routine clinics and it may require some training to administer. Also worthy of note is the difficulty of assessing erythema in dark skinned individual as erythema may not be clinically evident because of the skin color. This makes PASI really challenging to use in dark skin. However, the authors have observed in a recent unpublished study that erythema is more appreciated and assessed using a dermoscope with a slightly higher scores in some individual, although there was no statistically significant difference in overall PASI scores with this modification, thus, suggesting the tool is applicable.

4. Self-Administered Psoriasis Area and Severity Index (SAPASI):

This is a structured modification of PASI which allows assessment of psoriasis severity to be done by patients rather than the clinician. It has been validated in many regions but not native West Africans and has been documented to correlate well with PASI.(26, 27) Like PASI, SAPASI has also been reported to correlate with symptoms of psoriasis including psoriatic arthritis. (27) It has the advantage that a call can be put through to assess severity as well as the fact that it can be done at convenience and as many times as possible. However, it should be noted that patient's objective assessment is subject to errors, it may be influenced by several parameters, it requires an enlightened and motivated patient thereby making it seemingly unrealistic in our setting.

5. Copenhagen Psoriasis Severity Index (CoPSI):

This involves assessment of erythema, plaque thickness and scaling, each on a four-point scale (0, none; 1, mild; 2, moderate; 3, severe), at each of 10 sites: face, scalp, upper limbs (excluding hands and wrists), hands and wrists, chest and abdomen, back, buttocks and sacral area, genitalia, lower limbs (excluding feet and ankles), feet and ankles giving a score range of 0 to 90.(28) It was developed after PASI and PGA and has been described to have intrarater and inter-rater reliability values similar to PASI but better than those of PGA. It leaves out assessment of area involved as required in PASI and BSA in a bid to avoid the inherent inaccuracies that may ensue. The CoPSI may overcome several of the problems associated with the PASI. In particular, the CoPSI avoids the neeto estimate a percentage of skin involved, It's additional benefits includes being able to separate milder cases unlike the PASI, more simple and linear as well as ability to evaluate different anatomical areas more meaningfully.

6. Salford Psoriasis Index (SPI):

This tool acknowledges and incorporates three separate aspects of patient's psoriasis severity for measurement; current clinical severity based on the PASI, psychological impact (QoL score) and past severity based on treatment history including for example history of admission for treatment. The three-figure SPI (signs, psychosocial disability, interventions) can be viewed to share resemblance with the TNM (tumour, nodes, metastasis) staging used for cancer grading with the PASI transformed into a number from 0 to 10 as the sign while the psychosocial impact score (PSI) on a 0-10 visual analogue scale is used to assess the psychosocial disability. (29) This concept gives a more holistic approach to patient's severity putting in mind the psychological impact and symptoms. It also has the advantage of allowing the use of validated tools that has been adapted to a specific region thereby giving room for acceptability and wider coverage. For

instance, cutaneous sensation such as pruritus and post-inflammatory dyspigmentation which is more peculiar and disturbing to our population may be incorporated for better holistic assessment.

7. National Psoriasis Foundation Psoriasis Score (NPF-PS):

This was developed in response to the observation that some of the commonly used tools such as PASI and PGA fail to measure patient's quality of life and perception of well-being.(30) It has been demonstrated to have strong correlation with PASI and PGA though studies on the tool are still few due to its complexity. Unlike the PASI, it correlates well with quality of life(31, 32) and integrates input from patient as well as rates thickness as a predominant characteristic of lesion similar to SPI. However, its use is challenged by it's complexity, non-linearity, lack of robust or extensive studies and lack of acceptance by agencies and many clinicians.

8. Lattice System Physician's Global Assessment (LS-PGA):

It is similar to the PGA, but integrates a quantitative approach with the global assessment of disease severity by adding ranges of involved BSA and the overall plaque morphology. (21, 33) The percentage BSA ranges involved are stratified as follows; 0, 1–3, 4–9, 10–20, 21–29, 30–50 and 51–100%. The LS-PGA gives more weight to thickness compared with scaling and erythema thereby making it a fairer tool for shades of skin where recognition of erythema may pose a challenge. Severity is subsequently graded into eight categories (clear to very severe). Validity and reliability have been demonstrated to be very good and it has suggested to be a good follow up measure as it is sensitive to clinical change although studies on the tool are still very few.(21, 22)

9. Psoriasis Log-based Area and Severity Index (PLASI):

A derivative of PASI in which the BSA estimation domain in PASI is grouped into six ranges (0-2, 2-5, 5-10, 10-21, 21-46 and 46-100%) with finer partitioning for smaller extents of BSA affected so as to reduce the error resulting from inaccurate estimation of BSA in patients with less extensive disease, also to increase the sensitivity of PASI in patients with mild disease.(21) A study described it as the most reliable measure for the severity and therapeutic improvement in moderate to severe psoriasis as it was proven to be marginally more accurate than PASI, and much more accurate than SAPASI and BSA.(34)

In some regions, there have been debate and discussion on best approach to psoriasis severity measurement and many has shown that assessing clinical severity alone is not sufficient. (35, 36) A European panel after systematic review of available evidence concluded that severity measure in psoriasis should be a multidimensional approach that puts into consideration symptoms, severity of skin lesions, health related quality of life, effect on mood e.t.c although PASI was recommended as most valid and reproducible clinical severity tool.(36) A similar observation by a working group on psoriasis severity assessment in South Africa made the team to recommend the use of severity tools in conjunction with quality of life assessment as measures of severity in their guidelines.(37)

As experience on many of these tools are few, we encourage comparative studies that may help suggest and validate ideal psoriasis severity measures for our skin type. A panel to discuss and recommend guidelines in determining severity is also suggested. However, in reaching a consensus it should be borne in mind that an ideal measure is clearly defined with maximum objectivity, universally applicable, is easy to use, flexible and has clinical significance(21, 38, 39) not forgetting the attention that evaluating erythema in our skin color may pose as well as other peculiarities worth addressing. Generally, majority of these tools require training for accurate assessment and this has been demonstrated to be effective with the use of standardized video-based online training platforms. (40) It is therefore advised that standardized image or video-based material should be deployed for uniformity when any of the tool is adapted.

Conclusion

Severity assessment of inflammatory skin

conditions inclusive of psoriasis is important for our routine clinics and researches but this might be challenged by some difficulties with applicability of some of the tools. It is therefore pertinent that as African dermatologist, we come up as a group to discuss the limitations, way forward and agree on a severity tool for a uniform assessment and comparison of results. However, we suggest the use of clinical severity scoring tools in combination with symptoms, quality of life, site of lesion and other comorbidities such as psoriatic arthritis as an ideal measure.

Psoriasis Global Assessment (PGA)[3]

Description of a PGA	
Severe	Very marked plaque elevation, scaling, and/or erythema
Moderate to Severe	Marked plaque elevation, scaling, and/or erythema
Moderate	Moderate plaque elevation, scaling, and/or erythema
Mild to moderate	Intermediate between moderate and mild
Mild	Slight plaque elevation, scaling, and/or erythema
Almost clear	Intermediate between mild and clear
Clear	No signs of psoriasis (postinflammatory hyperpigmentation may be present)

Physician's Global Assessment

PASI Scoring Sheet[2]

Patient Name and Surname: ..... Date: .....

Medical Aid: ..... Number: .....

Step 1: Determine surface area score (use scoring column). Copy totals into row ❺ below
Step 2: Assign a score for the erythema, thickness and scaling below, then add in row ❹
Step 3: Multiply the values of rows ❹, ❺ and ❻ for each column and enter into row ❼
Step 4: Calculate PASI score by adding the values across row ❼

	Head	Upper Limbs	Trunk	Lower Limbs	*Use these numbers for surface area scores
Degree of involvement as % for each body region affected					0 = none 1 = <10% 2 = 10-20% 3 = 30-49% 4 = 50-69% 5 = 70-80% 6 = 90-100%
Area Score *Score each region with a score between 0-6					

	Plaque Characteristic	Head	Upper Limbs	Trunk	Lower Limbs	Rating Score
	Erythema					0 = none 1 = slight 2 = moderate 3 = severe 4 = extraordinarily severe
	Thickness					
	Scaling					
❹	Sum of erythema, thickness and scaling					
		x	x	x	x	
❺	Area Score					
		x	x	x	x	
❻	Weighting Factor	0.1	0.2	0.3	0.4	
❼	❹ x ❺ x ❻		+	+	+	=
						PASI Score

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