Outcome Measures in Psoriasis and Psoriatic Arthritis

Noori Kim · Alice B. Gottlieb

Published online: 27 June 2013
© Springer Science+Business Media New York 2013

Abstract The recent health policy imperatives in the United States have consequentially called to attention the absence of dermatologic evaluations in the health outcome and quality measures that will ultimately grade the success of providers. Psoriasis, in particular, represents a patient cohort with a chronic, complex and debilitating skin disorder commonly encountered in dermatology clinics that can have insufferable consequences from disease progression and comorbidities if it is not properly evaluated and managed. In order to have the appropriate compensation to the providers and the availabilities of the correct treatments to the patients, the presence of psoriasis-specific outcome measures are necessary. Incorporating the concepts employed by the rheumatology group, Outcome Measures for Rheumatoid Arthritis Clinical Trials (OMERACT), that created outcomes for several musculoskeletal diseases, initiatives in dermatology have already begun to create standardized, validated psoriasis outcome measures.

Keywords Health outcomes · Outcome measures · Psoriasis · Psoriatic arthritis · Quality-of-life · OMERACT (Outcome Measures for Rheumatoid Arthritis Clinical Trials)

Introduction

Psoriasis remains one of the most prevalent skin disorders, affecting up to 6 % of the population worldwide [1, 2]. Much insight into the immunobiology of this chronic inflammatory condition of the skin and joints has been uncovered. This progress is reflected in the considerable recent advances in management options. Yet, despite the various available therapies, from topical corticosteroids, phototherapy, and oral systemic immunosuppressants to biologics, the disease burden of psoriasis patients still is undertreated [3]. Choosing the appropriate therapy tailored to each patient is deemed difficult, as no

formal guidelines that incorporate the diversity of psoriasis treatments exist; and, importantly, clinical trial settings that evaluate therapeutic efficacies do not necessarily reflect real world practices, and the outcomes measured in clinical trials are not practical in the community setting; they are non-standardized and flawed. Access is one of the major obstacles to optimizing psoriasis treatment, as payers and regulatory agencies often do not view the affected patients' needs as medically necessary. The complexity of psoriasis can be overlooked, as the current endpoints or outcome measures frequently utilized in psoriasis clinical trials only partially address the needs of clinical research and regulatory agencies, and may not account for the perspectives of other relevant stakeholders, including patients, third-party payers, and practicing physicians. Psoriasis outcome measures should aim to not only evaluate and monitor skin disease severity, but also to capture other critical aspects of this multisystem disease, such as psoriatic arthritis, poor quality of life, obesity, depression, loss of work productivity, cardiovascular morbidities, and cost burdens. Responsive, feasible psoriasis outcome measures that can be broadly applied across research as well as clinical practice are essential to optimizing patient care. These tools must be collaboratively developed and validated, especially during a time when the quality and value of health care will be ultimately determined by outcomes and cost-savings, emphasizing the importance of disease-specific outcome measures to appropriately address the needs of this patient population.

Existing Psoriasis and Psoriatic Arthritis Outcome Measures

Psoriasis is the most measured skin disease in dermatology, but there are particular discrepancies between the existing outcome measures in what elements are being evaluated and whether they are clinically meaningful. The current psoriasis outcome measures commonly applied in clinical studies are not standardized and can entail cumbersome calculations, making them impractical for everyday clinical use. Ideally,

N. Kim (✉) · A. B. Gottlieb
Department of Dermatology, Tufts Medical Center,
800 Washington Street, Box 114, Boston, MA 02111, USA
e-mail: noorikim23@gmail.com

psoriasis outcome measures should be able to accurately capture disease severity, including disease progression and clinical response to a particular intervention, health-related quality-of-life issues, and cost-effectiveness as a means to justify reimbursements to services or the use of certain medications. To date, there is no consensus on any of the existing psoriasis outcome measures that adequately address all these components.

The Physician Area and Severity Index (PASI), Physician's Global Assessment (PGA), Body Surface Area (BSA), and the Lattice System Physician's Global Assessment (LS-PGA) are only some of the physician-reported disease severity measures [4•, 5, 6]. PASI is the most commonly applied validated disease severity outcome measure in clinical trials; yet, the difficulties in the scale's interpretation and complex calculation make it impractical to use outside of the research setting. Furthermore, the nonlinear scale lacks sensitivity in the lower range, is redundant in the upper range, and is compounded by the fact that it fails to account for other relevant symptoms, such as pruritus, nail disease, quality-of-life, and comorbidities [4•]. In efforts to address the limitations of PASI, other outcome measures were developed: Simplified PASI (SPASI), Psoriasis Log-based Area and Severity Index (PLASI), Psoriasis Exact Area and Severity Index (PEASI), and Psoriasis Assessment Severity Score (PASS) [7–11].

The PGA, both static and dynamic, only assesses the average quality of the psoriatic plaque with significant variations in the scale (5 to 7 points, depending upon which PGA is used) and definition. The PGA does not quantify the affected BSA, and like the PASI, does not include evaluation of nail disease, pruritus, quality-of-life, or comorbidities. Despite these variables, the PGA is widely used due to its simplicity. The LS-PGA and the Simple-Measure for Assessing Psoriasis Activity (S-MAPA) improve upon the PGA by incorporating the BSA, but are not widely recognized and are not used in clinical trials [4•, 5, 6, 12].

There are separate distinct patient-reported psoriasis outcome measures: Self-Administered PASI (SAPASI), Visual Analog Scale (VAS), and Psoriasis Symptoms Inventory (PSI) [13–17]. Attempts to incorporate both the physician's and patient's assessments have led to the creation of composite severity scales, such as the National Psoriasis Foundation Score (NPF-PS), Salford Psoriasis Index (SPI), and Dermatology Index of Disease Severity (DIDS), all of which are not commonly utilized [18–22].

As none of the disease severity outcome measures account for any quality-of-life issues, a separate Dermatology Life and Quality Index (DLQI) consists of ten questions that examine the disability, physical functioning, and social and well-being of psoriasis patients [23•, 24, 25]. The DLQI was the first dermatology specific quality-of-life measure, and the Psoriasis Disability Index was a subsequent attempt to quantify quality-of-life [26].

Progress to reaching consensus on outcome measures specific to psoriatic arthritis have already been spearheaded by an international rheumatology professional group, Outcome Measures for Rheumatoid Arthritis Clinical Trials (OMERACT), and a joint dermatology and rheumatology group, the Group for Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA) [27]. The measures used to assess joint disease in psoriasis patients are those that extended from response measures validated in rheumatoid arthritis: American College of Rheumatology (ACR) response criteria, Psoriatic Arthritis Response Criteria (PsARC), and the Disease Activity Score (DAS). These criteria include inflammatory joint counts and account for both physician and patient's assessments of disease activity. The ACR measures also assess quality-of-life and adjunctive laboratory markers: erythrocyte sedimentation rate or C-reactive protein. There are also psoriatic arthritis-specific quality-of-life measures distinct from the DLQI, such as the Health Assessment Questionnaire (HAQ), Medical Outcome Study Short-form 36 (SF-36), and the Psoriatic Arthritis Quality of Life (PsAQoL) [28, 29].

While steps towards standardizing and validating psoriatic arthritis measures are being made, it still stands that a majority of dermatologists do not regularly evaluate joint disease in psoriasis patients, deeming these particular outcome measures inapplicable in their practices. There is a crucial need for outcome measures that account for the comorbidities associated with psoriasis, including arthritis and cardiovascular risk factors that are practical and relevant to dermatologists, as failure to recognize these outcomes can inevitably lead to significant disease progression and morbidity.

Moreover, there are other outcome measures specific to particular aspects of psoriasis, such as the Nail Psoriasis Severity Index (NAPSI), Psoriasis Scalp Severity Index (PSSI), and the Palmoplantar Psoriasis Area and Severity Index (PPPASI), that are not commonly used and recognized in the general dermatology community outside of clinical studies [30, 31•, 32, 33•].

At this time, there exists a complex myriad of disease severity outcome measures, a few variably addressing quality-of-life, and none that evaluate economic impact for psoriasis. This highlights the prerogative to clarify and/or develop psoriasis outcome measures that are concomitantly reliable and applicable, yet accurately assess meaningful change within the entire disease spectrum of psoriasis. The success and influence of OMERACT within the field of rheumatology have provided dermatology with a well-organized, established foundation and model to pursue this initiative.

OMERACT: Outcome Measures for Rheumatoid Arthritis Clinical Trials

OMERACT was initially formed as an international work group that recognized particular discrepancies within clinical

trials on the management of rheumatoid arthritis [34]. It became apparent that the choice of outcome measures in these clinical trials incorporated to reflect the benefits and harms of certain interventions were not standardized with considerable heterogeneity across studies, contained the potential for bias and selective outcome reporting, and were neither practical nor relevant to users. As a result, OMERACT proposed to develop a consensus on clinical trial core sets, which essentially encompass a minimum set of validated outcome measures that should be evaluated and reported in all clinical trials [35].

OMERACT established the importance of international collaboration on a methodological framework and the application of validity concepts to review existing outcome measures and the final selection of which should be used. Ultimately, the selected measures should address long-term outcomes, be sensitive to change, and avoid redundancy.

In general, OMERACT is based on the interest, support, and participation of health professionals, patients, methodologists, regulatory agencies, and industry. In particular, the key addition of patients as research partners helped target resources towards issues important to patients and elucidate any missed aspects of patient care. This would also be an opportunity to bridge any disconnect between the providers and patients with a better, well-rounded understanding of the disease and its impact learned directly from patients. The entire process is data-driven, iterative, stepwise, and inclusive with ample opportunity to discuss topics relating to the shortcomings of a disease's outcome measures and what is being evaluated. Presentations of specific topics and data analyses are done that need further discussion. Small nominal group discussions and interactive voting among the members aim to subsequently uncover any consensus in response to the presented issues without any chance of bias [35].

OMERACT defined successful outcome measures to be *truthful* or unbiased, *discriminative* or reliable and sensitive to change, as well as *feasible*, or in other words, applicable and easily interpretable. The measures should always address and measure what they intend to evaluate or the core areas, which are aspects of health conditions that appropriately assess the effects of a specific health intervention [35]. Based on a conceptual paradigm originally implemented in 1980, essential core areas should encompass: death, life impact or quality-of-life issues, economic impacts, and pathophysiological manifestations that include organ and body structure and function as well as biomarkers [36]. The final goal of OMERACT is then to agree on instruments or tools that account for the disease-specific domains within the core areas, by either validating existing measures or creating novel ones [35].

OMERACT began with an emphasis on rheumatoid arthritis to later have an essential role in validating outcome

measures for many other rheumatologic disorders. Using the OMERACT processes as a template, the objective is to create the first standardized, validated disease-specific outcome measures for dermatology.

International Dermatology Outcome Measures

The inaugural meeting for the International Dermatology Outcome Measures group (IDEOM) took place in Boston, MA in January of 2013, and set out to establish dermatology outcome measures based on the methods already utilized by OMERACT, with psoriasis as the first disease studied. The meeting was highlighted by presentations from different thought leaders to introduce OMERACT concepts, gather perspectives from relevant stakeholders in psoriasis care, such as patients, physicians, and third-party payers, and engage in preliminary exercises to create a list of important items to consider for the validation of psoriasis outcome measures. This effort will require broad participation from international and local dermatology groups, industry, patients, relevant experts on quality-of-life, pain, pediatrics, and cardiology, payers, and regulatory agencies. While the initial focus is on clinical trials, given that they are internationally recognized, progressively, the clinical trials outcome measures should converge with clinical practice to be useful to all participants.

Conclusion

The changing face of health care shifts the primary focus of quality and value of care by transferring risk and accountability to the providers. Reimbursements will progressively be determined by quality and outcome improvements, and, at least in the United States, none of the quality and outcome measures used for performance-based payments are related to psoriasis or even broadly to dermatology [37•]. This is especially problematic for patients with complex skin diseases like psoriasis and for the physicians dedicated to managing them, if their needs are not being accurately represented and compensated, pitfalls already faced in Massachusetts through physician tiering [38]. Initiatives, like the International Dermatology Outcome Measures, are crucial to providing a legitimate forum for relevant, applicable psoriasis-specific outcome measures to be established. Hopefully, the next steps will be to garner more interest and support to create and standardize outcome measures for other dermatologic diseases, not only ensuring the needs of dermatology to be well-represented within health policy, but also to allow the formation of international guidelines and efficacy research in optimizing treatment strategies.

Compliance with Ethics Guidelines

Conflict of Interest N Kim declares no conflicts of interest.

AB Gottlieb is an investigator with the following: Abbott (Abbvie) Laboratories, Amgen Inc., Celgene Corporation, Janssen Biotech Inc., Lilly ICOS LLC, Novartis Pharmaceuticals Corp., Novo Nordisk A/S, Pfizer Inc., UCB; has consulting/advisory board agreements with the following: Abbott (Abbvie) Laboratories, Actelion, Amgen Inc., Astellas Pharma US Inc., Beiersdorf Inc., Bristol Myers Squibb Co., Canfite, Celgene Corporation, Coronado, DermiPsor Ltd., Incyte Corporation, Janssen Biotech Inc., Karyopharm, Lilly ICOS LLC, Novartis Pharmaceuticals Corp., Novo Nordisk A/S, Pfizer Inc., TEVA, UCB, Vertex; and has research/educational grants with the following: Abbott (Abbvie) Laboratories, Amgen Inc., Celgene Corporation, Janssen Biotech Inc., Lilly ICOS LLC, Novartis Pharmaceuticals Corp., Pfizer Inc.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

References

Papers of particular interest, published recently, have been highlighted as:

- Of importance

- Farber EM, Nall L. Epidemiology: natural history and genetics. In Psoriasis. Edited by M.H. Roenigk HR Jr. New York: Marcel Dekker; 1998. 107–57.
- Raychaudhuri SP, Farber EM. The prevalence of psoriasis in the world. *J Eur Acad Dermatol Venerol*. 2001;15:16–7.
- Stern RS, Nijsten T, Feldman SR, Margolis PJ, Rolstad T. Psoriasis is common, carries a substantial burden even when not extensive, and is associated with widespread treatment dissatisfaction. *J Invest Dermatol Symp Proc*. 2004;9:136–9.
- Puzenat E, Bronsard V, Prey S, et al. What are the best outcome measures for assessing plaque psoriasis severity? A systemic review of the literature. *J Eur Acad Dermatol Venerol*. 2010;24 Suppl 2:10–6. *A systematic review that evaluates the various psoriasis severity scales applied in clinical studies based on validation and quality criteria.*
- Feldman SR, Krueger GG. Psoriasis assessment tools in clinical trials. *Ann Rheum Dis*. 2005;64(Suppl II):ii65–8.
- Langley RG, Ellis CN. Evaluating psoriasis with Psoriasis Area and Severity Index, Psoriasis Global Assessment, and Lattice System Physician's Global Assessment. *J Am Acad Dermatol*. 2004;51:563–9.
- Louden BA, Pearce DJ, Lang W, Feldman SR. A Simplified Psoriasis Area Severity Index (SPASI) for rating psoriasis severity in clinic patients. *Dermatol Online J*. 2004;10:7.
- Jacobson CC, Kimball AB. Rethinking the Psoriasis Area and Severity Index: the impact of area should be increased. *Br J Dermatol*. 2004;151:381–7.
- Henseler T, Schmitt-Rau K. A comparison between BSA, PASI, PLASI and SAPASI as measures of disease severity and improvement by therapy in patients with psoriasis. *Int J Dermatol*. 2008;47:1019–23.
- Jacobson CC, Kimball AB. Rethinking the Psoriasis Area and Severity Index: the impact of area should be increased. *Br J Dermatol*. 2004;151:381–7.
- Harari M, Shani J, Hristakieva E, Stanimirovic A, Seidl W, Burdo A. Clinical evaluation of a more rapid and sensitive Psoriasis Assessment Severity Score (PASS), and its comparison with the classic method of Psoriasis Area and Severity Index (PASI), before and after climatotherapy at the Dead-Sea. *Int J Dermatol*. 2000;39:913–8.
- Dommasch E, Woodcock J, Shin D, Duffin K, Gelfand J. Validity of the Simple-Measure for Assessing Psoriasis Activity (S-MAPA). Seoul, Korea: Presented at the World Congress Dermatology; 2011.
- Feldman SR, Fleischer Jr AB, Reboussin DM, et al. The self-administered psoriasis area and severity index is valid and reliable. *J Invest Dermatol*. 1996;106:183–6.
- Shiklar R, Bresnahan BW, Stone SP, et al. Validity and reliability of patient reported outcomes used in psoriasis: results from two randomized clinical trials. *Health Qual Life Outcomes*. 2003;1:53.
- Kwok T, Pope JE. Minimally important difference for patient-reported outcomes in psoriatic arthritis: Health Assessment Questionnaire and pain, fatigue, and global visual analog scales. *J Rheumatol*. 2010;37:1024–8.
- Martin ML, McCarrier KP, Chiou CF, et al. Early Development and Qualitative Evidence of Content Validity for the Psoriasis Symptom Inventory, a Patient-Reported Outcome Measure of Psoriasis Symptom Severity. *J Dermatol Treat*. 2012. doi:10.3109/09546634.2012.759639.
- Bushnell DM, Martin ML, McCarrier K, et al. Validation of the Psoriasis Symptom Inventory (PSI), a patient-reported outcome measure to assess psoriasis symptom severity. *J Dermatol Treat*. 2012. doi:10.3109/09546634.2012.742950.
- Krueger GG. The NPF Psoriasis Score. The National Psoriasis Foundation Psoriasis Forum 1999;5(4).
- Kirby B, Fortune DG, Bhushan M, Chalmers RJ, Griffiths CE. The Salford Psoriasis Index: an holistic measure of psoriasis severity. *Br J Dermatol*. 2000;142:728–32.
- Kirby B, Richards HL, Woo P, et al. Physical and psychologic measures are necessary to assess overall psoriasis severity. *J Am Acad Dermatol*. 2001;45:72–6.
- Faust HB, Gonin R, Chuang TY, et al. Reliability testing of the dermatology index of disease severity (DIDS). An index for staging the severity of cutaneous inflammatory disease. *Arch Dermatol*. 1997;133:1443–8.
- Hahn HB, Chuang TY. Using the Dermatology Index of Disease Severity (DIDS) to assess the responsiveness of dermatitis. *Clin Exp Dermatol*. 2006;31:19–22.
- Mattei PL, Corey KC, Kimball AB. Psoriasis Area Severity Index (PASI) and the Dermatology Life Quality Index (DLQI): the correlation between disease severity and psychological burden in patients treated with biological therapies. *J Eur Acad Dermatol Venerol*. 2013. doi:10.1111/jdv.12106. *A systematic review of psoriasis clinical studies that analyzes the correlation of PASI and DLQI scores in psoriasis patients receiving biologics.*
- Safikhani S, Sundaram M, Bao Y, Mulani P, Revicki DA. Qualitative assessment of the content validity of the Dermatology Life Quality Index in patients with moderate to severe psoriasis. *J Dermatol Treat*. 2013;24:50–9.
- Finlay AY, Khan GK. Dermatology Life Quality Index (DLQI): a simple practical measure for routine clinical use. *Clin Exp Dermatol*. 1994;19:210–6.
- Finlay AY, Khan GK, Luscombe DK, et al. Validation of Sickness Impact Profile and Psoriasis Disability Index in psoriasis. *Br J Dermatol*. 1990;123:751–6.
- Mease PJ, Gladman DD, Krueger GG. Prologue: Group for Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA). *Ann Rheum Dis*. 2005;64:ii1–2.
- Gladman DD, Mease PJ, Krueger G, et al. OMERACT 7 Workshop: Outcome Measures in Psoriatic Arthritis. *J Rheumatol*. 2005;32:2262–9.

29. Gladman DD, Mease PJ, Healy P, et al. Proceedings of OMERACT 8: Outcome Measures in Psoriatic Arthritis. *J Rheumatol*. 2007;34:1159–66.
30. Rich P, Scher RK. Nail Psoriasis Severity Index: a useful tool for evaluation of nail psoriasis. *J Am Acad Dermatol*. 2003;49:206–12.
31. • Bagel J, Lynde C, Tying S, Kricorian G, Shi Y, Klekotka P. Moderate to severe plaque psoriasis with scalp involvement: a randomized, double-blind, placebo-controlled study of etanercept. *J Am Acad Dermatol*. 2012;67:86–92. *The study incorporates a severity scale specific to scalp psoriasis to monitor therapeutic response and efficacy of etanercept.*
32. Brunasso AMG, Salvini C, Massone C. Efalizumab for severe palmoplantar psoriasis: an open-label pilot trial in five patients. *J Eur Acad Dermatol Venerol*. 2009;23:415–9.
33. • Bissonnette R, Poulin Y, Guenther L, Lynde CW, Bolduc C, et al. Treatment of palmoplantar psoriasis with infliximab: a randomized, double-blind placebo-controlled study. *J Eur Acad Dermatol Venerol*. 2011;25:1402–8. *The study applies a severity scale specific to palmoplantar psoriasis, which is used to evaluate therapeutic response and efficacy of infliximab.*
34. Boers M, Brooks P, Strand CV, Tugwell P. The OMERACT Filter for Outcome Measures in Rheumatology. *J Rheumatol*. 1998;25:198–9.
35. Tugwell P et al. OMERACT: an international initiative to improve outcome measurement in rheumatology. *Trials*. 2007;8:38.
36. Fries JF, Spitz P, Kraines RG, Holman HR. Measurement of patient outcome in arthritis. *Arthritis Rheum*. 1980;23:137–45.
37. • Department of Health and Human Services: Centers for Medicare and Medicaid Services. Accountable Care Organization 2012 Program Analysis Quality Performance Standards Narrative Measure Specifications Final Report. Available at: http://www.cms.gov/sharedsavingsprogram/Downloads/ACO_QualityMeasures.pdf. Accessed April 2013. *Summarizes the quality and performance measures that will grade accountable care organizations in the United States.*
38. Freedman JD, Gottlieb AB, Lizzul PL. Physician performance measurement: Tiered networks and dermatology (An opportunity and a challenge). *J Am Acad Dermatol*. 2011;64:1164–9.