Dermatology Screening Tools: Project Update from the GRAPPA 2012 Annual Meeting

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ABSTRACT. Several screening tools for early identification of psoriatic arthritis (PsA) have been developed. While these tools had high sensitivity and specificity during their development and initial validation, it remained to be determined how they would function with widespread use. At the 2012 annual meeting of the Group for Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA) in Stockholm, Sweden, these tools were compared for their utility when used to screen patients for PsA in clinics other than those in which they were developed. The screening tools did not perform as well as previously published, and members suggested new tools may need to be developed. An additional study of the prevalence of PsA in a large cohort of psoriasis patients, the PREPARE study, which investigated the use of screening questionnaires, was also presented. (J Rheumatol 2013;40:1425–7; doi:10.3899/jrheum.130455)

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Psoriatic arthritis (PsA) is an inflammatory musculoskeletal disease that affects about 30% of patients with psoriasis. The disease may be severe, leading to joint damage, joint deformity and disability, as well as reduced quality of life and function, and may be associated with increased mortality[1,2,3]. Even in early arthritis, erosions were detected in 27% of the patients within an average of 10 months from onset of symptoms, and in 47% of the patients within 2 years[4]. It has been suggested that early diagnosis of patients with PsA would lead to appropriate treatment and avoid some of these untoward consequences[5].

Many psoriasis patients have PsA that is not initially recognized by the patients or by the attending physician. In studies performed at dermatology clinics in Europe, 20%–30% of the patients were not diagnosed with PsA until

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the time of the research visit[6,7,8], further demonstrating the importance of early diagnosis.

The ClASsification criteria for Psoriatic ARthritis (CASPAR) were developed to facilitate the classification of PsA[9]. These criteria are highly sensitive and specific, and function well in both early and late disease[10,11,12,13]; however, they can be applied only to patients who have inflammatory musculoskeletal disease — peripheral arthritis, axial disease, or enthesitis — which are difficult for nonexperts to recognize. Therefore, dermatologists and other physicians need tools to screen psoriasis patients for the presence of PsA. Several tools have been developed[14,15,16,17]. The Leeds group used the Psoriatic Arthritis Questionnaire (PAQ), originally developed by Paul Peloso, as a substrate, with added questions on back disease and a manikin where patients mark their affected areas. The resultant Psoriasis Epidemiological Screening Trial (PEST) demonstrated high sensitivity (92%) and very good specificity (78%)[14]. In Boston, a joint effort by dermatologists and rheumatologists resulted in the development of the Psoriatic Arthritis Screening Evaluation (PASE)[15], with a sensitivity of 82% and specificity of 73% (at a cutoff of 47). An updated version provides a sensitivity of 70% with improved specificity at 80% (cutoff of 47), and both sensitivity and specificity of 76% (cutoff of 44)[18]. Another screening tool, the Psoriatic Arthritis Screening Questionnaire (PASQ), was developed in St. John's, Newfoundland, Canada, and uses the PAQ with a manikin identifying the joint areas involved. The PASQ provided a very high sensitivity of 97% and a specificity of 75% (cutoff of 7)[16].

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were compared for their utility when used to screen patients for PsA in clinics other than those in which they were developed.

ToPAS and ToPAS 2

Dafna Gladman (Toronto, Canada) reviewed the development and validation of the ToPAS, used to identify PsA in patients with or without psoriasis[17]. Developed initially through input from patients and physicians, ToPAS includes 12 questions about psoriasis, nail lesions, joint pain and swelling, back pain and stiffness, and dactylitis, with pictures of the skin and nail lesions. ToPAS was validated in 5 groups of patients (from a PsA clinic, dermatology clinic, family medicine clinic, rheumatology clinic, and phototherapy center), all of whom were evaluated by a rheumatologist for the presence of PsA. The ToPAS demonstrated high sensitivity (87%) and specificity (93%) in those groups of patients[17].

In the original version of ToPAS, the presence of axial symptoms did not contribute to the instrument, perhaps because questions were not specific enough. Moreover, it was thought that patients might not be able to recognize joint disease and dactylitis. Subsequently, on the ToPAS 2, questions on axial disease were modified and pictures of inflamed joints as well as dactylitis were added. ToPAS 2 was tested among individuals participating in family studies and had sensitivity of 95.9%, specificity of 98.7%, with a positive predictive value of 98.9% and a negative predictive value of 94.9% when PsA patients were compared to unaffected individuals. The ToPAS and PASE were compared; although the former had a higher area under the curve (AUC), confidence intervals overlapped, suggesting that both tools functioned well[19].

Comparison of ToPAS, PASE, and PEST

Philip Helliwell and colleagues (Leeds, UK) tested ToPAS, PASE, and PEST in patients undiagnosed with PsA in the CONTEST (COmparisoN of ThreE Screening Tools) trial[20]. All 3 questionnaires were distributed in packages to psoriasis clinics in the UK and were randomized by instrument order. Patients were age ≥ 16 years, able to read and understand English, with a diagnosis of psoriasis made by a dermatologist, and without a previous diagnosis of PsA. Patients were each given all 3 questionnaires and asked to come back only if they screened positive in any of the questionnaires. Of 938 packages that were distributed, 657 were returned; 314 patients screened positive by at least one questionnaire and 195 were examined by a rheumatologist. Forty-seven of those 195 were diagnosed with PsA by the CASPAR criteria. Of those screening positive on the questionnaires, 15% of patients with PsA screened positive on 1 questionnaire, 33% on 2 questionnaires, and 47% on all 3 questionnaires. Results of each questionnaire were calculated according to its developers' instructions. Based on

these calculations, the sensitivity, specificity, and AUC were 76.6%, 29.7%, and 0.554 for the ToPAS; 74.5%, 38.5%, and 0.594 for the PASE; and 76.6%, 37.2%, and 0.610 for the PEST.

The results of the CONTEST trial were compared with those published by Haroon, et al[8] in a Dublin study that included 200 patients: 100 consecutive patients with psoriasis with no known inflammatory arthritis from dermatology clinics, and 100 patients with PsA from rheumatology clinics. All patients were seen by a rheumatologist and completed all 3 questionnaires. Of interest, the 2 studies had opposite specificity and sensitivity results. High sensitivity and low specificity was documented in CONTEST; low sensitivity and high specificity was documented in the Dublin study. The CONTEST study did not examine all patients and therefore might have underestimated specificity. Both studies showed lower AUC than the original development studies of the questionnaires, and the PEST had the best AUC results in CONTEST. Further, screening tools identified many patients with non-PsA arthritis, because they identify other musculoskeletal diagnoses if patients have significant symptoms, and thus may not be as accurate as they were in development.

Psoriatic Arthritis Screening Questionnaire

The PASQ, discussed by Majed Khraishi (St. John's, Newfoundland, Canada), contains 10 differently weighted questions as well as a diagram on which patients marked where they have or have had pain and/or swelling. PASQ was validated in a group of established PsA (58 patients); a group with psoriasis but not PsA (29 patients); and in patients with early PsA and patients with psoriasis but no PsA[16]. The original validation showed sensitivity of 86% and specificity of 89%, and a newer electronic version showed high sensitivity (93%) but not as good specificity (75%). However, the electronic version was tested only in an early-PsA cohort, and may not be as accurate in patients with early disease[21]. Patients found it easy to use, and the tool is available free online.

PREPARE Study

The Prevalence of Psoriatic Arthritis in Adults With Psoriasis: An Estimate from Dermatology Practice (PREPARE) study, discussed by Philip Mease (Seattle, WA, USA), is a non-interventional assessment of psoriasis patients in dermatologists' offices[22]. The ToPAS, PASQ, and PEST were administered to 1000 patients, although each patient completed only one questionnaire, so no comparative data are available. Patients had one visit with the dermatologist followed by 2 visits with a rheumatologist. At the first visit with the rheumatologist determination of the patient's PsA was based on clinical features. In a subset of sites, imaging was performed in 20% of the patients with subsequent assessment based on clinical features and

radiographs. The overall prevalence of PsA was 30%; 12% (41% of the PsA cohort) were new diagnoses. Of 47 patients previously diagnosed with PsA (5% of the cohort), the current rheumatologist's assessment found no PsA, but determined that these patients may have other diagnoses such as osteoarthritis. The majority of PsA diagnoses (99%) could be made on the basis of clinical evaluation alone. Similar results were found in both university clinics and primary practice offices.

In summary, although screening tools developed to identify PsA early were found to be highly sensitive and specific during development and initial validation, further studies suggest that they may not perform as well in the clinic. Measuring the effect of the musculoskeletal symptoms on function and quality of life may be one way of improving the specificity of these tools, thus filtering out other rheumatic disorders that may cause the screening tool to score positively. Notably, however, assessment of the effect on function was included in the PASE, but PASE did not score better than the other instruments. Therefore, the most important screening tool for use in dermatology clinics would have a high sensitivity. New instruments may be needed to address this issue.

REFERENCES

1. Gladman DD. Disability and quality of life considerations: Psoriatic arthritis. In: Gordon GB, Ruderman E, editors. Psoriasis and psoriatic arthritis: An integrated approach. Heidelberg: Springer-Verlag; 2005:118-23.
2. Rosen CF, Mussani F, Chandran V, Eder L, Thavaneswaran A, Gladman DD. Patients with psoriatic arthritis have worse quality of life than those with psoriasis alone. Rheumatology 2012;51:571-6.
3. Gladman DD. Mortality in psoriatic arthritis. Clin Exp Rheumatol 2008;26:S62-5.
4. Kane D, Stafford L, Bresnihan B, FitzGerald O. A prospective, clinical and radiological study of early psoriatic arthritis: An early synovitis clinic experience. Rheumatology 2003;42:1460-8.
5. Gladman DD. Early psoriatic arthritis. Rheum Dis Clin North Am 2012;38:373-86.
6. Reich K, Kruger K, Mossner R, Augustin M. Epidemiology and clinical pattern of psoriatic arthritis in Germany: A prospective interdisciplinary epidemiological study of 1511 patients with plaque-type psoriasis. Br J Dermatol 2009;160:1040-7.
7. Christophers E, Barker JN, Griffiths CE, Dauden E, Milligan G, Molta C, et al. The risk of psoriatic arthritis remains constant following initial diagnosis of psoriasis among patients seen in European dermatology clinics. J Eur Acad Dermatol Venereol 2010;24:548-54.
8. Haroon M, Kirby B, Fitzgerald O. High prevalence of psoriatic arthritis in patients with severe psoriasis with suboptimal performance of screening questionnaires. Ann Rheum Dis 2013 May;72:736-40.
9. Taylor W, Gladman D, Helliwell P, Marchesoni A, Mease P, Mielants H. Classification criteria for psoriatic arthritis: Development of new criteria from a large international study. Arthritis Rheum 2006;54:2665-73.
10. Chandran V, Schentag CT, Gladman DD. Sensitivity of the classification of psoriatic arthritis criteria in early psoriatic arthritis. Arthritis Rheum 2007;57:1560-3.
11. D'Angelo S, Mennillo GA, Cutro MS, Leccese P, Nigro A, Padula A, et al. Sensitivity of the classification of psoriatic arthritis criteria in early psoriatic arthritis. J Rheumatol 2009;36:368-70.
12. Coates LC, Conaghan PG, Emery P, Green MJ, Ibrahim G, MacIver H, et al. Sensitivity and specificity of the classification of psoriatic arthritis criteria in early psoriatic arthritis. Arthritis Rheum 2012;64:3150-5.
13. van den Berg R, van Gaalen F, van der Helm-van Mil A, Huizinga T, van der Heijde D. Performance of classification criteria for peripheral spondyloarthritis and psoriatic arthritis in the Leiden Early Arthritis cohort. Ann Rheum Dis 2012;71:1366-9.
14. Ibrahim GH, Buch MH, Lawson C, Waxman R, Helliwell PS. Evaluation of an existing screening tool for psoriatic arthritis in people with psoriasis and the development of a new instrument: The Psoriasis Epidemiology Screening Tool (PEST) questionnaire. Clin Exp Rheumatol 2009;27:469-74.
15. Husni ME, Meyer KH, Cohen DS, Mody E, Qureshi AA. The PASE questionnaire: pilot-testing a psoriatic arthritis screening and evaluation tool. J Am Acad Dermatol 2007;57:581-7.
16. Khraishi M, Mong J, Mugford G, Landells I. The electronic Psoriasis and Arthritis Screening Questionnaire (ePASQ): A sensitive and specific tool to diagnose psoriatic arthritis patients. J Cutan Med Surg 2011;15:143-9.
17. Gladman DD, Schentag CT, Tom BD, Chandran V, Brockbank J, Rosen C, et al. Development and initial validation of a screening questionnaire for psoriatic arthritis: The Toronto Psoriatic Arthritis Screen (ToPAS). Ann Rheum Dis 2009;68:497-501.
18. Dominguez PL, Husni ME, Holt EW, Tyler S, Qureshi AA. Validity, reliability, and sensitivity-to-change properties of the psoriatic arthritis screening and evaluation questionnaire. Arch Dermatol Res 2009;301:573-9.
19. Diaconu-Popa DA, Driessen RJB, Kerkhof PCM, van Riel PLCM, de Jong EMGJ, Fransen J. Performance of two screening instruments, ToPAS and PASE, for detecting psoriatic arthritis in patients with psoriasis [abstract]. Ann Rheum Dis 2009;68:656.
20. Coates LC, Aslam T, Al Balushi F, Burden AD, Burden-Teh E, Caperon AR, et al. Comparison of three screening tools to detect psoriatic arthritis in patients with psoriasis (CONTEST study). Br J Dermatol 2013;168:802-7.
21. Khraishi M, Chouela E, Bejar M, Landells I, Hewhook T, Rampakakis E, et al. High prevalence of psoriatic arthritis in a cohort of patients with psoriasis seen in a dermatology practice. J Cutan Med Surg 2012;16:122-7.
22. Mease PJ, Gladman DD, Papp KA, Khraishi MM, Thaci D, Behrens F, et al. Prevalence of rheumatologist-diagnosed psoriatic arthritis in psoriasis patients in European/North American dermatology clinics. J Am Acad Dermatol 2013; (submitted for publication).