Screening/referral strategies for the early recognition of psoriatic arthritis (PsA) among patients with psoriasis: results of a GRAPPA survey

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ABSTRACT

Objective: This study aimed to explore the experiences of dermatologists and rheumatologists in the early recognition of psoriatic arthritis (PsA) and to identify potential improvements to the current shared-care model.

Methods: A 24-question survey addressing referral strategies was constructed within GRAPPA (Group for Research and Assessment of Psoriasis and Psoriatic Arthritis) and sent to all members (n=927). Questions addressed the use of screening tools, frequency of PsA in patients with psoriasis, therapeutic decision making, and suggestions for earlier PsA recognition and current unmet needs.

Results: There were 149 respondents (16.1% response rate), which included 113 rheumatologists from 37 countries, and 26 dermatologists from 16 countries. Of dermatologists, 81% use PsA-specific screening instruments. Conversely, rheumatologists reported that only 26.8% of patients referred to them from all sources had been assessed with screening tools. Whilst dermatologists reported that a mean of 67% of suspected PsA cases were confirmed, rheumatologists reported a mean of 47.9% of confirmed cases. Both specialties reported similar views regarding optimisation of the diagnostic process and indicated that the best approach involved combining patient-reported (i.e. screening tools) and physician-confirmed findings. Moreover, both specialties identified the education of primary care physicians (PCPs) and dermatologists as the greatest priority to improve PsA screening

Conclusion: The survey indicated the current unmet needs in the early recognition of PsA. Important areas to address include improving the use of screening instruments, increasing the education of community-based dermatologists and PCPs, and utilising a combination of patient-reported and physician-confirmed findings in the screening approach.

INTRODUCTION

Psoriatic arthritis (PsA) is a progressive, chronic and inflammatory disease that can present in a variety of forms, including peripheral and/or axial joint pain and swelling, enthesitis and dactylitis. Around two-thirds of PsA patients are thought to experience skin signs and symptoms before any joint involvement(1). The factors behind the diagnostic delay of PsA are multifaceted. Notably, PsA can present in a heterogenous manner: the disease encompasses several domains of musculoskeletal (MSK) symptoms and also varying extra-axial manifestations(2). Moreover, despite extensive exploration of different biomarkers, including autoantibodies, cytokines and genetic polymorphisms, a validated diagnostic biomarker for routine clinical use remains elusive(3). Notably, acute phase reactants (e.g. C-reactive protein) do not consistently correlate with PsA disease activity(4).

Earlier recognition of joint pain and other MSK symptoms in psoriasis patients, and subsequently prompt diagnosis and treatment of PsA, are vital. PsA can develop rapidly, manifesting in destructive radiological changes(5), accelerated joint damage and reduced quality of life(6). Notably, a six-month delay between symptom onset and a rheumatology consultation is associated with worse long-term physical function(7).

The presence of psoriasis is a risk factor for developing PsA, although the prevalence rates of PsA in psoriasis patients have been shown to vary from 6-30%(8,9). Nevertheless, around half of patients with psoriasis experience joint pain, and a third report dactylitis-like and/or enthesitis-like symptoms. Although these pain symptoms can sometimes be elucidated by alternate diagnoses, such as other arthritic diseases, the fact that skin disease most often precedes the development of arthritis exemplifies the importance of dermatologists and PCPs in early PsA recognition. Given the impracticalities of rheumatologists assessing all individuals with psoriasis for PsA, dermatologists and PCPs in particular represent crucial gatekeepers, with the ability to screen for and refer high probability PsA cases. Screening tools have been developed attempting to identify PsA amongst people living with psoriasis but are not frequently used.

In this survey we aimed to explore the views and practices of both rheumatologists and dermatologists regarding PsA screening, diagnosis and care. In particular, we evaluated clinicians' use of screening tools, their opinions on the optimal method to confirm PsA diagnosis, and the greatest unmet needs which currently impede early PsA recognition.

METHODS

A 24-question survey was constructed by a steering committee of the project consisting of GRAPPA (Group for Research and Assessment of Psoriasis and Psoriatic Arthritis) members. The GRAPPA project steering committee, which includes rheumatologists, dermatologists and Patient Research Partners (PRPs), was also responsible for analysing the results of the survey. Questions addressed the use of screening tools, frequency of PsA in patients with psoriasis, therapeutic decision making, and suggestions for earlier PsA recognition and current unmet needs. The survey was sent to all 927 GRAPPA members, which include rheumatologists, dermatologists and PRPs. Ethics approval was not applicable for this study.

RESULTS

A total of 149 GRAPPA members (16.1% response rate) completed the survey between October 3rd and October 16th 2022. Amongst the respondents, there were 113 rheumatologists from 37 different countries, 26 dermatologists from 16 countries, 7 Patient Research Partners , 2 other physicians and 1 non-physician. The specialists had a mean of 21.7±10.7 and 18±12.3 years of experience, respectively, and the majority (76.9% for rheumatologists and 92% for dermatologists) reported working in a university setting.

Initial referral and assessment

Dermatologists reported that a mean of 24% (standard deviation (SD): 11%) of their patients with psoriasis also have PsA (Table 1a). Almost all dermatologists (96%) indicated they evaluate MSK symptoms in patients with psoriasis (Table 1b). Whilst 77% assessed for these symptoms in all psoriasis patients, 19% only did so when MSK symptoms were reported by the patient (Table 1b).

Dermatologists used an array of approaches to identify psoriasis patients with a high probability of PsA: 89% relied on physical examination (i.e. presence of arthritis, enthesitis, dactylitis), whilst 85% used patient-reported MSK symptoms (i.e. joint pain, back pain) (Table 1c). This was followed by the use of a screening questionnaire (74%), imaging findings (58%) and finally lab reported findings (39%) (Table 1c). In general, 81% of dermatologists indicated that they use screening questionnaires for psoriasis patients who they believe are likely to have PsA (Table 1d). Out of the dermatologists that used screening instruments, The Psoriasis Epidemiology Screening Tool (PEST) was the most widely used (81%), followed by The Psoriatic Arthritis Screening and Evaluation Tool (PASE) (24%) (Table 1e). Dermatologists estimated that they referred a mean of 85% of patients with suspected PsA to rheumatology (Table 1f), whilst 67% (SD: 28%) of referrals by dermatology for suspected PsA eventually received diagnostic confirmation (range: 15-100%) (Table 1g).

Rheumatologists estimated that a mean of 42.9% (SD: 24.9%) of psoriasis patients presenting to their clinics had seen a dermatologist within a year prior to diagnosis (Table 2a). However, variation was marked, ranging from 0.1%-99%. Only 26.8% of rheumatologists reported that the patients referred to them have been screened using specific screening instruments (Table 2b). In such cases, PEST was the most widely used (60% of patients) (Table 2c). Rheumatologists estimated that 47.9% (SD: 24.2%) of patients with suspected PsA referred to them eventually received a diagnosis of PsA (range: 0.5-100%) (Table 2d).

Therapeutic decision making

We then explored whether there were inter-specialty differences regarding which specialty was considered responsible for therapeutic decision-making. For psoriasis and PsA patients requiring treatment escalation (i.e. introduction of conventional synthetic, targeted synthetic or biologic Disease Modifying Anti-Rheumatic Drugs (DMARDs)) dermatologists most commonly adopted an interdisciplinary approach (54%), discussing treatment plans with rheumatologists (Table 1h). Conversely, such interdisciplinary decision making was the least frequent approach taken by rheumatologists (25.7%) (Table 2e). Moreover, 23% of dermatologists stated that the speciality responsible for therapeutic decisions depended on the patient's clinical manifestations (i.e. skin vs MSK involvement), whilst 19% specified dermatologist-led treatment escalation (Table 1h). For rheumatologists, the speciality responsible for therapeutic decisions was most commonly dictated by clinical manifestation (40.4%). This was followed by rheumatologists treating patients without interdisciplinary discussion, regardless of the nature of skin vs MSK involvement (35.8%) (Table 2e).

Optimising the screening process

We asked clinicians how the screening processes for identifying patients with suspected PsA could be optimised. Across all responses, 78.2% believed that a combination of patient reported (i.e. screening questionnaires) and physician-confirmed findings represent the most effective means of screening patients (Fig. 1a). This was viewed as the optimal approach by 85% of dermatologists (Fig. 1b) and 76.6% of rheumatologists (Fig. 1c). The next most commonly suggested approaches across all responses were a lab-based approach (12.9%), followed by sole physician-confirmed findings (6.1%) (Fig. 1a).

Both specialties were then asked about what they thought was the biggest unmet need in relation to early PsA recognition. Interestingly, there were disparities in the answers: dermatologists most frequently pointed to a lack of education of dermatologists (85%) and PCPs (65%) (Fig. 2a), whilst rheumatologists conversely most commonly highlighted education of PCPs (79.8%) and dermatologists (62.4%) (Fig. 2b). Other unmet needs that were raised by all respondents (including

PRPs and other clinicians) were long waiting times (46.3%), lack of rheumatologists/available appointments (42.9%), poor performance of screening instruments (37.4%), and education of rheumatologists (22.4%) (Fig. 2c).

Qualitative comments

At the end of our survey, we asked respondents if they had any additional comments regarding current challenges to PsA screening and early recognition. The most commonly raised areas included patient education, biomarkers, imaging and inter-specialty collaboration. Here we explore the key areas raised in greater detail.

Eight answers referred to the lack of specific, cost-effective biomarkers and/or screening tools for diagnosing PsA. This is summarised by one rheumatologist who said, *"It would be great if we could come up with a diagnostic screening tool for rheumatology/dermatology with good specificity that would help clinicians in the referral process and us in [achieving] early diagnosis"* Interestingly, several respondents also highlighted that imaging, particularly ultrasound, could be an important facet of screening, although one clinician noted that, *"imaging including MRI may be falsely negative in patients with active enthesitis or spondylarthritis."*

Three clinicians and two patient research partners highlighted a need for patient education, particularly for patients with psoriasis. Indeed, one patient research partner highlighted that, *"When a patient is initially diagnosed with PsO [Psoriasis], they should be given signs to look out for PsA."* *Moreover, another PRP cites the responsibility of the clinician when diagnosing PsA or psoriasis, "There is also a lack of knowledge of most patients when confronted for the first time with any information about the conditions. The first physician to diagnose PsO or PsA should be aware of such a gap.*"

Three respondents emphasised the importance of maintaining inter-speciality approaches to practice. One answer noted that this approach extends beyond just rheumatology and dermatology: *"In addition to rheumatologists, dermatologists and family physicians, immunologists and physical medicine and rehabilitation specialists in some countries diagnose, treat and monitor PsA."*

Finally, although the need for further clinician education was conveyed in the quantitative data, some key educational points were raised. Firstly, one rheumatologist stated, *"There should be an extensive education among physicians (primary care physicians, dermatologists and rheumatologists) concerning a specific point: a normal blood test does not exclude PsA and the absence of arthritis and enthesis swelling does not exclude PsA.*", another rheumatologist expressed that, *"Rheumatologists need to be educated that early PsA is not as easy to diagnose and not the same as*

early RA (i.e. majority get erosions), so managing and expressing uncertainty to patients is required, rather than making an incorrect diagnosis."

DISCUSSION

In this global survey, we explore the clinician-based factors that may contribute to delayed recognition of PsA. In particular, the use of screening tools was widely discussed and remains an unsolved issue in the field. Notably, screening tools were reported to be used by three quarters of responding dermatologists nevertheless, they were only used in approximately a quarter of all rheumatology referrals for suspected PsA. This finding most likely reflects the disparities in practice between community-based dermatologists and GRAPPA dermatologists. Indeed, the latter are commonly expert specialists based in university care centres, with a special interest in psoriasis/PsA, and therefore may be more likely to employ PsA screening tools. The disparity may also be elucidated by the fact that a substantial share of patients were referred to rheumatology by alternate routes, such as primary care and self-referral.

Two-thirds of patients with suspected PsA referred by dermatologists received diagnostic confirmation, conversely, less than half of all the referrals received by rheumatology were confirmed as PsA. This disparity may reflect both the different clinical manifestations that present to each specialty, but also the effective use of screening tools (and use of different tools) by dermatologists. Again, this finding may also reflect differences between dermatologists who are GRAPPA members and those that are community based. GRAPPA-dermatologists reported use of validated screening instruments and evaluation of MSK manifestations by themselves, while the majority of patients referred to rheumatologists received no dedicated screening for PsA at all. To date, the literature regarding the real practice of PsA screening amongst dermatologists, PCPs, and other clinicians is sparse. Research around screening instruments has mainly explored the implementation and validation of these tools in secondary care settings(10), and only a handful of studies have explored their use in primary care(11).

Although we did not explore the breakdown of the different specialties that make referrals to rheumatology, the overall low rates of screening instrument usage reported by rheumatologists are striking. Guidance regarding PsA screening in patients with psoriasis varies across different countries. Notably, in the UK, The National Institute for Health and Care Excellence (NICE) guidance stipulates that patients with psoriasis should be screened for PsA annually(12); this policy is supported by evidence from a systematic review which predominantly focused on North American and European data, and showed that the prevalence of undiagnosed PsA in patients with psoriasis to be 15.5%(13).

Effective use of screening tools represents a prerequisite for early PsA recognition. Current evidence highlights that such instruments can play an important role in PsA screening across both primary care and dermatology clinic settings. In the PREPARE (Prevalence of Psoriatic Arthritis in Adults with Psoriasis: An Estimate From Dermatology Practice) study of 949 psoriasis patients across European and North American, comparative analysis of three different screening tools revealed high negative predictive values (≥0.83) and sensitivity values of 0.67 (Psoriasis and Arthritis Screening Questionnaire) (PASQ)), 0.77 (Toronto Psoriatic Arthritis Screen (ToPAS)) and 0.84 (PEST)(14). These are consistent with previous studies based on dermatology-centred screening, which showed sensitivity ranging from 0.68-0.85(10,15). In a primary care setting, PEST was shown to be the most favourable screening instrument, based on its sensitivity (0.68) and specificity (0.71)(16).

A body of early evidence suggested that the specificity of screening tools tends to be notably lower than sensitivity(10,15). However, a subsequent systematic review from 2019, which conducted pooled specificity analysis for four commonly used screening tools (ToPAS, PASE, PEST, and Early Psoriatic Arthritis Screening (EARP)), showed encouraging specificities (ranging from 0.68-0.85) (17). This discrepancy is potentially elucidated by the heterogenous nature of PsA, as well as variations in the study design and population. Nevertheless, altogether, these findings reinforce the notion that screening instruments are useful, but alone they are insufficient; namely, diagnoses also requires subsequent clinical evaluation.

To that end, approximately 80% of clinicians expressed the view that a combined approach utilizing both patient-reported (i.e. screening tools) and physician confirmed findings represents the optimal means of identifying PsA in psoriasis patients. Indeed, screening instruments could initially be used to accurately and quickly exclude patients without PsA, thus reducing rates of inappropriate referral to rheumatologists. Subsequently, physician-confirmed findings could help facilitate differentiation of PsA from other arthritic diseases: such an approach circumvent some of the aforementioned limitations of screening tools. This strategy would likely manifest in varying ways across different specialties. For example, in addition to the screening tool results, physiotherapists could assess the range of movement around key joints. Elsewhere, dermatologists and PCPs could perform targeted MSK examinations. Ultimately, there is a need for a future study that considers our findings in the context of different referral practices, to find an optimal referral strategy, which is highly specific, sensitive and cost-effective. Such work can help streamline the referral process to rheumatology and facilitate earlier recognition of PsA in patients with psoriasis.

Aside from the clinician-centred factors that may underpin undiagnosed/delayed PsA diagnosis, an important alternative factor to consider is patient education. Here, in our qualitative data, both clinicians and PRPs referenced the need to address psoriasis patients' awareness of the increased risk of PsA and the associated symptoms. Currently, psoriasis patients' understanding of the skin

symptoms, triggers and management have been well explored(18). However, aside from one survey which showed that 91% of psoriasis patients know that PsA can occur on a background of psoriasis, there is a paucity of data which addresses either psoriasis patients' awareness of the increased risk of developing PsA or knowledge of PsA symptoms. Efforts to educate psoriasis patients about PsA are vital, and could help empower them to seek earlier clinical advice relating to potential PsA symptoms. Indeed, previous research has shown that psoriasis patients want to be actively involved in decision-making processes relating to their care, however insufficient patient knowledge is a barrier to this and is associated with poorer patient satisfaction(19).

Our data suggest that dermatologists tend to adopt an interdisciplinary approach to treatment. This reinforces findings from the Multinational Assessment of Psoriasis and Psoriatic Arthritis (MAPP) survey: dermatologists were predominantly responsible for managing skin symptoms, whilst rheumatologists were responsible for overall prescribing decisions(20). This finding may be reflective of the nature of patients presenting to each specialty; namely, rheumatologists may see patients with more mild psoriasis who do not require input from dermatology. Nevertheless, it is notable that in the MAPP survey, 73.2% of rheumatologists were solely responsible for prescribing decisions for PsA patients, compared to 35% of rheumatologists in our study. This disparity may be due to the fact that since the MAPP survey, there has been a growing trend to promote collaboration between different specialties in PsA management. This is best exemplified by the emergence of combined dermatology-rheumatology clinics, which facilitate integrated care of patients with psoriasis and PsA(21).

Overall, education of dermatologists and PCPs in relation to early PsA recognition were considered as the largest unmet needs. Notably, twice as many respondents identified education of PCPs as an unmet need compared to the poor performance of screening tools. This is consistent with a study from Wade et al. in 2016 which showed that 28% of psoriasis patients had PsA which had previously been undiagnosed/not recorded in their primary care medical records(22). Despite this, there is evidence that the referral process from primary care for suspected early inflammatory arthritis is improving. Notably, in the UK, data from the National Early Inflammatory Arthritis Audit (2021-2022) showed that the speed of referrals is improving: 54% of patients are now referred to secondary care within 3 days of initial presentation, compared to 47% two years prior (23). Thus, the next steps will be to survey PCPs directly and gauge whether psoriasis/PsA education is seen as the most significant unmet need regarding early PsA recognition, or whether other factors (e.g. lack of patient knowledge, delayed initial presentation) represent greater barriers in primary care.

Interestingly, out of the dermatologists surveyed, the greatest unmet need identified was education of dermatologists. This is consistent with previous data, which has shown that over a third of dermatologists have difficulty differentiating PsA from other arthritic disease(20). Moreover, 87.1% of dermatologists stated that PsA is likely underdiagnosed due to a failure to recognize the connection

between the skin and joint manifestations. These data highlight the importance of educating clinicians about the early signs and symptoms of PsA. In particular, the features that distinguish PsA from other rheumatic diseases (e.g. rheumatoid arthritis and osteoarthritis), as summarized in a recent review by Saalfeld et al.(24), should be emphasized.

There are some limitations of this study that warrant discussion. Firstly, the survey was solely distributed amongst GRAPPA members, with only 16% of members responding to the survey. Although low, this is likely an underestimate as many GRAPPA members are not practicing clinicians and thus would not have responded. GRAPPA members tend to be expert clinicians, based in University settings, with an inherent interest in psoriasis and PsA. Therefore, an important next step is to explore whether the results from our survey are representitive across non-GRAPPA clinicians, especially those based in non-University hospitals. For instance, it is likely that the reported use of screening questionnaires (especially in dermatologists) is higher in this group than would be by other clinicians. Moreover, whilst the dermatologists surveyed highlighted a need for more PsA education, only 26 dermatologists responded; the opinions expressed here need to be verified across more dermatologists, including non-GRAPPA clinicians. Secondly, given that our study is based on clinician-reported data, certain findings (e.g. the proportion of patients who receive diagnostic confirmation of PsA), may be prone to subjectivity and recall bias.

Finally, the education of PCPs was identified as a major unmet need by rheumatologists, dermatologists and Patient Research Partners. On the one hand, identifying the views of dermatologists and rheumatologists is valuable as they are likely to see a higher proportion of patients with psoriasis (and those at greater risk of developing PsA) than PCPs. Moreover, through encountering patients that have been referred by PCPs, secondary care clinicians are likely to have significant insight into PsA screening processes across primary care. Nevertheless, the next steps will involve surveying PCPs directly to elucidate their current practices, perceived barriers to early PsA recognition, as well as their amenability to PsA/psoriasis education.

CONCLUSION

According to the results of the survey, rheumatologists mostly see psoriasis patients with suspected PsA who are referred without any standardized referral instruments, which leads to PsA confirmation in less than half the referred patients. Per dermatologists and rheumatologists, future work to identify the optimal screening strategy for PsA in individuals with psoriasis should include a combination of patient-reported (i.e. screening tools) and physician-confirmed findings. The education of PCPs and dermatologists regarding early PsA recognition in psoriasis patients was identified as the biggest current unmet need, above long waiting times and poor performance of screening tools. We suggest that such education should focus on identifying the early signs and symptoms, especially clinical manifestations that differentiate PsA from osteoarthritis and rheumatoid arthritis.

Contributions

All authors have made substantial contributions to the conception or design of the work. KS, LC and DC were responsible for data analysis and writing the original draft. All authors provided critical feedback on the manuscript and approved the final version.

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Some of the data from this study has been used in an abstract that has been accepted for EULAR 2023.

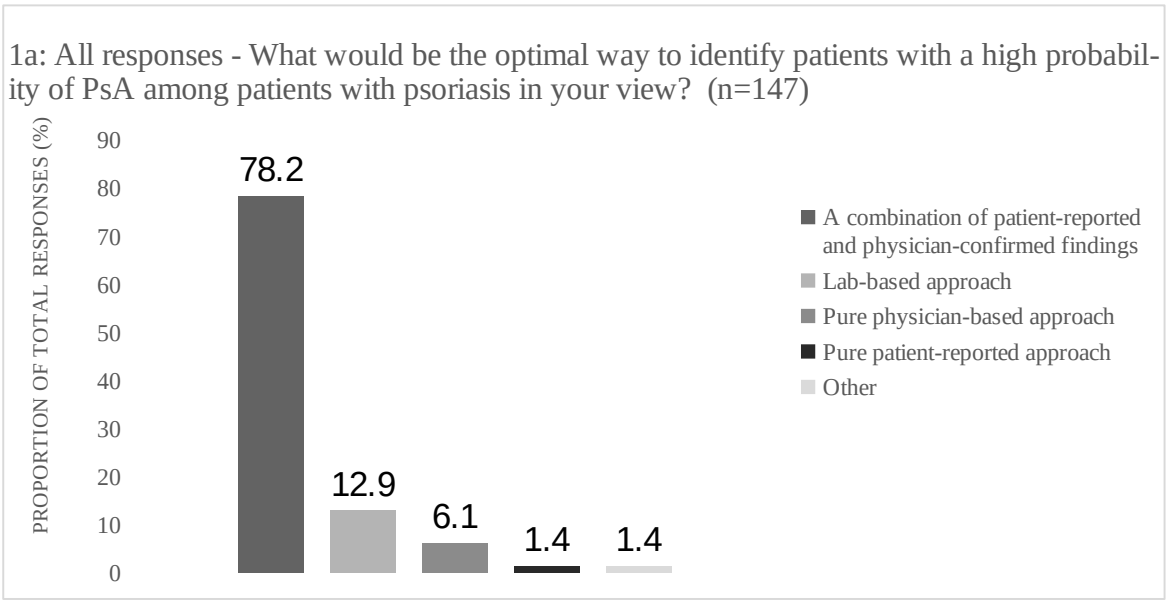
364 **Table 1. The dermatologists' perspective on early PsA recognition and care.**

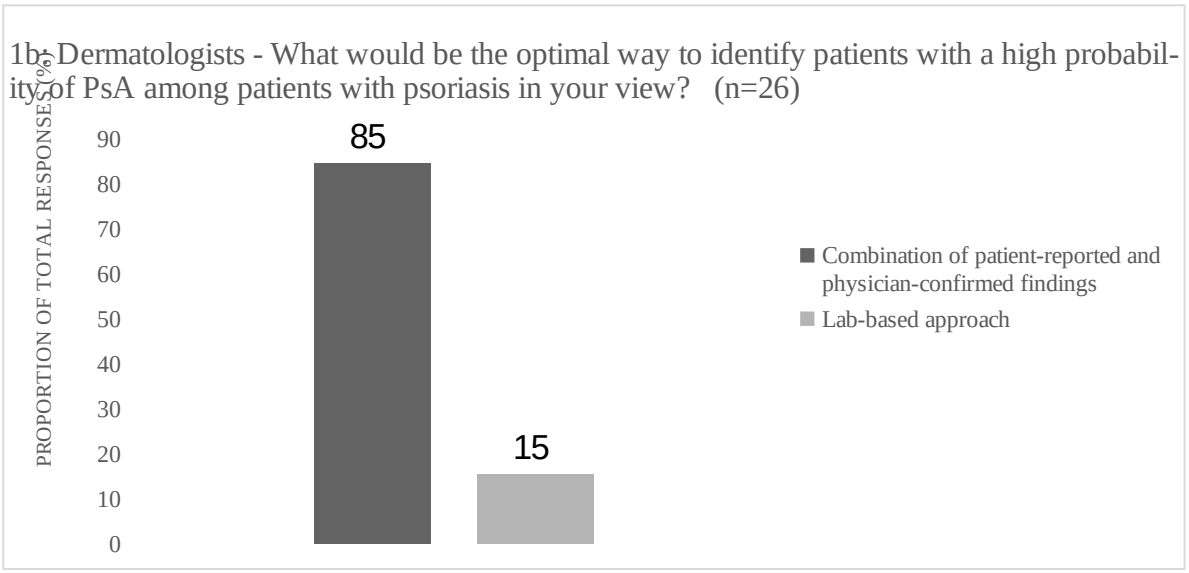
	Question	Answer choices	N of responders	Mean ± SD (range) or n (%) of responses
a	Out of all patients with psoriasis in your practice what is the approximate proportion of patients (%) who also have PsA?	N.A	26	24 ± 11 (5-50)
b	Do you evaluate actively the presence of musculoskeletal symptoms in your patients with psoriasis?	No	26	1 (4)
		Yes, but only in patients with complaints		5 (19)
		Yes, systematically in all patients		20 (77)
c	How do you identify patients with a high probability of PsA among patients with psoriasis?	Physical examination	26	23 (89)
		Patient-reported musculoskeletal symptoms		22 (85)
		Screening questionnaire		19 (74)
		Imaging findings		15 (58)
		Lab findings		10 (39)
d	Do you use specific screening / referral instruments to identify patients with a high probability of PsA among patients with psoriasis?	Yes	26	21 (81)
		No		5 (19)
e	Which specific screening/referral instruments do you use?	PEST	21	17 (81)
		PASE		5 (24)
		EARP		4 (19)
		Others (e.g. TOPAS, PURE-4, CONTEST)		4 (19)
f	Do you refer patients with psoriasis and suspicion of PsA to a rheumatologist?	No, I treat them myself	26	4 (15)
		Yes, selected cases (e.g. high pain levels, high impact)		9 (35)
		Yes,all patients with suspicion of PsA		13 (50)
g	In what proportion of patients (%) with suspected PsA in your practice, the presence of PsA can be finally confirmed?	NA	25	67 ± 28 (15-100)
h	In patients with psoriasis and PsA, which specialty is normally making the therapeutic decision (introduction of conventional synthetic, targeted synthetic and biologic DMARDs)?	Dermatologist	26	5 (19)
		Rheumatologist		1 (4)
		Depends on leading manifestation (skin vs musculoskeletal involvement)		6 (23)
		Interdisciplinary discussion involving dermatologists and rheumatologists		14 (54)

Table 2. The rheumatologists' perspective on early PsA recognition and care.

	Question	Answer choices	N of responders	Mean ± SD (range) or n (%) of responses
a	What proportion of patients with newly diagnosed PsA in your practice have seen a dermatologist in the year prior to diagnosis?	N.A.	107	42.9 ± 24.9 (0.1-99)
b	Do you see patients referred to you with specific screening / referral instruments?	Yes	112	30 (26.8)
		No		82 (73.2)
c	What screening / referral instruments are normally applied?	PEST	30	18 (60)
		TOPAS		4 (13)
		EARP		2 (7)
		SIPAS		2 (7)
		PURE-4		2 (7)
		Others		2 (7)
d	In what proportion of patients (%) with suspected PsA referred to you, can the presence of PsA be confirmed?	NA	109	47.9 ± 24.2 (0.5-100)
e	In patients with psoriasis and PsA, which specialty is normally making the therapeutic decision (introduction of conventional synthetic, targeted synthetic and biologic DMARDs)?	Rheumatologist	111	39 (35.8)
		Depends on leading manifestation (skin vs Musculoskeletal involvement)		44 (40.4)
		Interdisciplinary discussion involving dermatologists and rheumatologists		28 (25.7)

Figure 1. Opinions regarding optimisation of early PsA recognition in the opinion of GRAPPA members (a: All responses, b: Dermatologist, c: Rheumatologist)





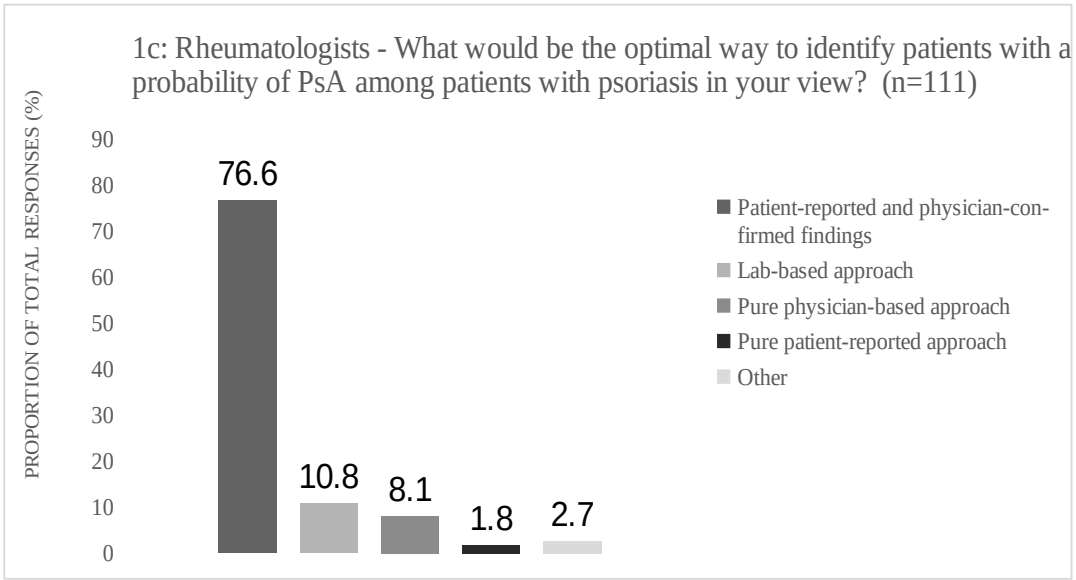
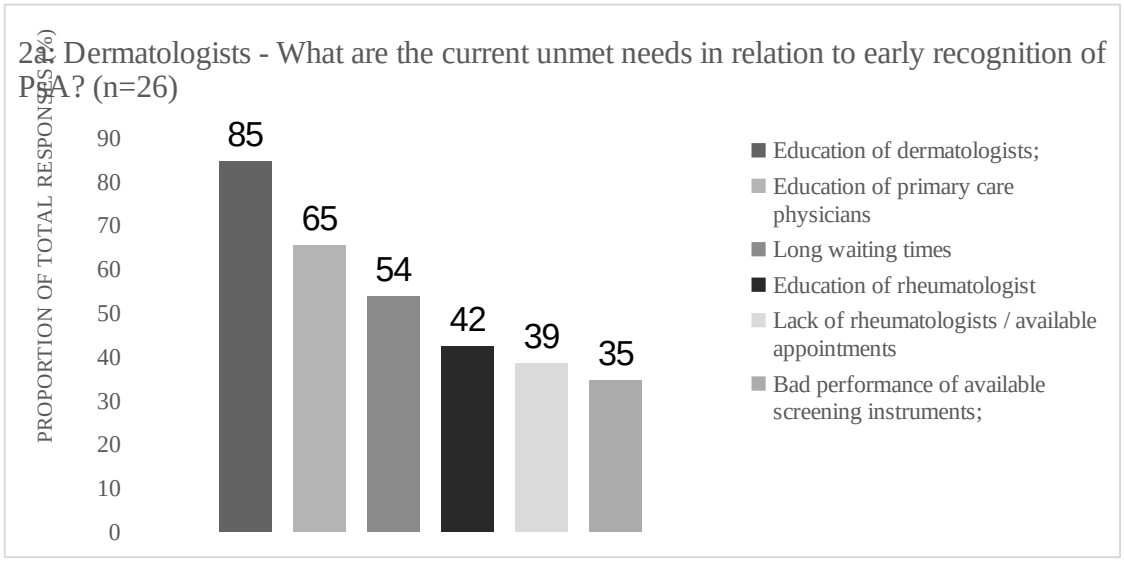
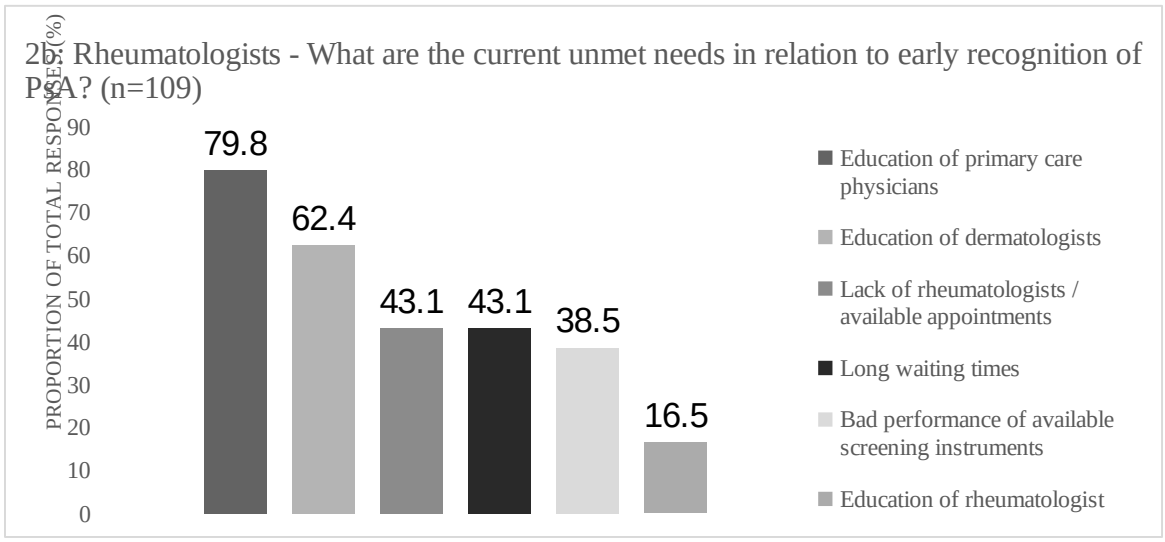


Figure 2. Current unmet needs in relation to the early PsA recognition in the opinion of GRAPPA members (a: All responses, b: Dermatologists, c: Rheumatologists)





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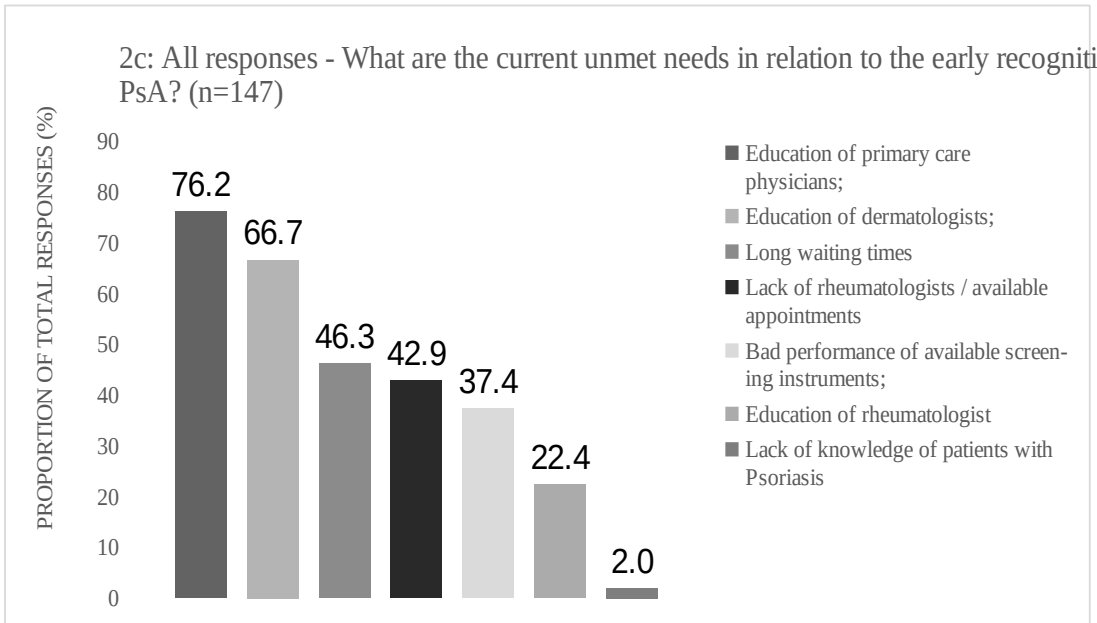

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