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Background: Identifying psoriatic arthritis (PsA) among people with psoriasis is often challenging due to low specificity of symptoms at early PsA stage and/or delayed referral to the rheumatologist. Screening instruments -assisting the dermatologist to decide when rheumatological assessment is beneficial- have potential to reduce the diagnostic delay.

Objectives: To evaluate the accuracy of a dermatologist-filled-out questionnaire designed for screening PsA among psoriatic patients under dermatology care.

Methods: HERACLES is a multicentre, cross-sectional study running at 9 Italian dermatology and rheumatology tertiary centres. All participants were under dermatology care for skin psoriasis. Previous diagnosis of PsA precluded eligibility. Dermatologists at each site assessed consecutive psoriatic subjects, filled in the specifically-designed HERACLES questionnaire (HQ, Figure 1) and finally referred the participants to rheumatologists for clinical evaluation. All participants filled in the ToPAS, PASE, PEST and EARP questionnaires. Rheumatologists assessed the participants regardless of the questionnaires' scores. The gold standard applied to assess the instruments' accuracy was the diagnosis of PsA as established by the rheumatologists. ROC curve analysis evaluated the performance of the scores associated with the clinical criteria listed in the HQ, estimating the sensitivity and specificity of different cut-off levels. Further exploratory ROC curve analysis compared HQ performance to that of the other four questionnaires tested.

Final set of clinical referral criteria: model of a form					
CENTRE NAME					
PATIENT'S DETAILS	Surname Name	Date of birth Age Sex		Date of collection	
	Psoriasis form	Age at psoriasis onset		Nail psoriasis YES NO	
	Familial history for psoriasis	Familial history for rheumatoid arthritis, ankylosing spondylitis or psoriatic arthritis		Height Weight Current PASI score	
	Current dermatological therapies		Previous dermatological therapies		
The patient complains of musculo-skeletal discomfort			YES		NO
ITEM		DETAILS	YES	NO	ITEM SCORE
1	The patient complains of arthralgias	Pain in one or more articular sites, continuous for at least 6 weeks, not due to trauma. The complain may be spontaneous or elicited	1	0	
2	The patient complains of spinal pain	Mostly at night, continuous, improves with exercise, insidious onset, for at least 8 weeks	1	0	
3	The patient reports history of heel discomfort	Entheses are the sites of insertion of tendons, ligaments and muscles on bones. The most important sites are the plantar fascia and Achilles' tendon at the heels	1	0	
4	The dermatologist sees joint swelling	Articular swelling, usually associated with pain, warmth and redness, not due to trauma	1	0	
5	The patient reports history suggestive of dactylitis OR The dermatologist sees digital swelling	Finger(s) or toe(s) are swollen, appearing as "sausages". There may be redness and pain, the onset may be insidious or acute. Rule out trauma. Comparison of the involved finger/toe with the other side is usually very helpful.	2	0	
6	The dermatologist sees joint deformity	Alteration of joints profiles, telescoping fingers/toes	1	0	
7	The dermatologist sees the patient limping	The patient comes to visit limping. Rule out trauma. Investigate elective surgery	1	0	
			TOTAL SCORE (0-8)		
If total score is 2 or more, consider referral to rheumatologist					

Figure 1.

Results: Out of 759 subjects enrolled, 524 (69%) attended rheumatology assessment. Rheumatologists diagnosed PsA in 73/524 patients (13.9%, Figure 2). Mean age was 53 (SD 16) years and 46% were female. Mean psoriasis duration was 20 (SD 19) years. The area under the ROC curve of HQ was 0.775. The HQ score cut-off value of 2 yielded a sensitivity of 92% and a specificity of 47%; a cut-off value of 3 yielded a sensitivity of 66% and a specificity of 75%. The comparison between the ROC curve of the HQ and those of the other four questionnaires evaluated did not show any significant difference (p=0.523 versus TOPAS; p=0.201 versus PASE; p=0.345 versus PEST and p=0.240 versus EARP).

Flow Chart, HERACLES study

Figure 2.

Conclusion: The HERACLES questionnaire, a tool designed for dermatologists, showed good sensitivity and specificity in identifying PsA cases among subjects with cutaneous psoriasis.

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SAT0413 DACTYLITIS IS ASSOCIATED WITH DISEASE SEVERITY AND ULTRASOUND DEFINED EROSIVE DAMAGE IN VERY EARLY, DMARD NAÏVE PSORIATIC ARTHRITIS

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Background: Dactylitis is a hallmark feature of Psoriatic arthritis (PsA) and Spondyloarthritis (SpA) defined as a uniform swelling of a digit ("sausage digit"). Dactylitis is associated with radiographic damage in chronic PsA. However, there are a paucity of data on the significance of dactylitis and its potential impact in disease burden in early PsA.

Objectives: To characterize a very early DMARD naïve PsA cohort based on clinical presence or absence of dactylitis at disease onset.

Methods: PsA subjects fulfilling the CASPAR classification criteria, were recruited into a prospective observational cohort, the Leeds Spondyloarthropathy Register for Research and Observation (SpARRO) after providing informed written consent. Clinical data including tender (TJC) and swollen joint counts (SJC) were independently assessed. Dactylitis was recorded per digit (finger or toe) as tender (hot) or non-tender (cold). Differences in baseline characteristics were evaluated using percentages to describe categorical variables and means and standard deviations for continuous variables, p value of the mean/proportion difference was calculated. Ultrasound (US) examination was conducted by trained ultra-sonographers blinded to clinical details. Bone erosions were defined on US if intra-articular discontinuity was present in two perpendicular planes at any of 46 joints: wrists, MCP1-5, PIP2-5, DIP2-5, MTP1-5, knees, ankles, subtalar, talonavicular.

Results: A total of 177 PsA patients were recruited. Dactylitis was seen in nearly half the cohort [n=83 (47%)]. Patients with dactylitis had significantly more early morning stiffness, higher TJC and SJC, compared with non-dactylitis (Table 1). A total of 211 digits with dactylitis were recorded in 83 patients. Dactylitis of multiple digits was seen in 47/83 (57%) patients whilst a single dactylitic digit occurred in 36/83 (43%). Foot involvement was more prevalent (141/211, 67%) than hands (70/211, 33%). "Hot" or tender dactylitis was more frequently detected (153/211,

72.5%) than "cold" or non-tender dactylitis (58/211, 27.5%). The most prevalent sites for hot dactylitis were toes 2-4th and fingers 2-3rd.

Table 1.

Variable	No Dactylitis (n=94)	Dactylitis (n=83)	P value
Age, mean (SD) years	44.4 (12.8)	43.7 (13.2)	>0.05
Male	38 (40.4%)	42 (50.6%)	>0.05
Disease duration, median (IQR) weeks	4.7 (0.0-11.4)	5.2 (1-22.4)	>0.05
Early Morning stiffness, mean (SD) mins	82.8 (145.4)	170.5 (230.2)	0.0025*
TJC (78), mean (SD)	8.3 (10.9)	13.7 (14.0)	0.004*
SJC (76), mean (SD)	2.2 (3.2)	8.4 (8.0)	<0.001*
Psoriasis	94/94 (100.0%)	76/83 (91.6%)	0.004*
PASI, mean (SD)	3.6 (4.0)	3.0 (4.1)	>0.05
Nail Dystrophy	51/94 (54.3%)	41/83 (49.4%)	>0.05
mNAPSI, mean (SD)	4.9 (7.1)	7.5 (14.0)	>0.05
MASES, mean (SD)	1.6 (2.9)	1.5 (2.4)	>0.05
BMI, mean (SD)	29.1 (6.4)	28.6 (5.6)	>0.05
Smoker	19.0 (20.2%)	9.0 (10.8%)	>0.05
Elevated CRP (>10mg/L)	24 (25.5%)	36 (43.4%)	>0.05
PsAQoL, mean (SD)	6.2 (6.6)	6.2 (6.1)	>0.05
HAQ, mean (SD)	0.79 (0.71)	0.84 (0.65)	>0.05
US Erosions (n=154)	12/83 (14.4%)	21/71 (29.5%)	0.023*

US defined erosions were significantly more prevalent in the dactylitis group: 34 erosions in 21/71 patients (29.5%) versus 16 erosions in 12/83 (14.4%) patients in non-dactylitis. Sites prone to erosive damage in both groups were the wrists, MCP1,2 and MTP4,5. The right MCP2 (n=6) and MTP5 (n=6) were most commonly eroded in the dactylitis group, but erosions corresponding at the dactylitic digit level were overall low.

Conclusion: This study identifies a more severe phenotype in very early DMARD naïve PsA presenting with dactylitis with higher prevalence of ultrasound erosions. Longitudinal follow up will determine whether dactylitis represents a poor prognostic factor in very early PsA, which may be a useful discriminator for risk stratification in future PsA management recommendations.

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SAT0414 THE PERFORMANCE OF A MULTI-MARKER GENETIC TEST TO IDENTIFY PATIENTS WITH PSORIATIC ARTHRITIS AMONG PSORIASIS PATIENTS

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Background: Improved understanding of the complex genetic architecture of psoriatic arthritis (PsA) along with the reduction in the cost of genetic testing provide an opportunity to assess the application of genetic testing for PsA diagnosis in clinical setting.

Objectives: The study aimed to assess the performance of the multi-SNP genetic test in predicting a clinical diagnosis of PsA by a rheumatologist among psoriasis patients with musculoskeletal symptoms.

Methods: 328 patients with psoriasis and musculoskeletal symptoms that were referred to a rapid access clinic for suspected PsA were enrolled. Patients with a prior diagnosis of PsA were excluded. A rheumatologist evaluated all patients and classified them as "PsA" or "not PsA". All patients who were classified as not PsA at baseline were reassessed 1 year later to determine whether they have developed PsA. We tested 2 outcomes: 1) diagnosis of PsA at baseline; and 2) diagnosis of PsA at baseline or at 1 year. A custom multi-SNP genetic assay was genotyped on a MassARRAY system (Agena Biosciences). The custom PsA weighted genetic panel included 42 variants in or near 20 genes based on genome-wide significance in PsA studies. We tested the ability of each genetic

maker individually to predict PsA using logistic regression models adjusted for age and sex. Machine-learning methods including logistic regression, naïve bayes and random forest were used to identify the optimal prediction model. Age and sex were included in the prediction models.

Results: 78 patients were classified as PsA (PsA-baseline) and the remaining 250 patients as not PsA. After 1 year, 17 additional patients developed PsA resulting in 95 patients with PsA at 1 year (PsA-1 year). The association between the tested SNPs and PsA is shown in Table 1. 5 SNPs located at LCE3A (rs10888503), TNIP1 (rs146571698) and IL-23R (rs4655683, rs2201841 and rs12044149) were associated with PsA-baseline or PsA-1 year (all p<0.05). Of the three machine-learning methods used, logistic regression was found to have the best prediction properties (highest AUC). Overall, the performance of prediction models to classify patients as PsA was modest (see Table 2). The AUC, sensitivity and specificity of the models to predict PsA at baseline were: 0.62, 0.15, 0.97, respectively and at 1 year: 0.62, 0.15, 0.94.

Table 1. The association between (selected top markers)

Chrom	SNP	Gene	PsA diagnosis at baseline (N=78)			PsA diagnosis at 1 year (N=95)		
			OR	95% CI	P value	OR	95% CI	P value
1	rs10888503	LCE3A	1.78	1.21, 2.62	0.003	1.52	1.06, 2.17	0.02
6	rs12191877	HLA-C	0.52	0.31, 0.89	0.017	0.63	0.39, 1.01	0.057
6	rs2894207	HLA-C*6	0.57	0.35, 0.93	0.025	0.62	0.39, 0.99	0.045
6	rs13214872	HLA-C	0.57	0.34, 0.96	0.035	0.65	0.41, 1.05	0.078
6	rs12189871	HLA-C	0.55	0.30, 1.01	0.055	0.68	0.40, 1.17	0.169
6	rs4406273	HLA-C	0.57	0.32, 1.02	0.057	0.67	0.40, 1.12	0.122
5	rs146571698	TNIP1	2.03	0.97, 4.24	0.061	2.07	1.02, 4.18	0.044
1	rs4655683	IL-23R	1.42	0.97, 2.08	0.069	1.52	1.06, 2.17	0.022
1	rs2201841	IL-23R	0.72	0.50, 1.05	0.087	0.68	0.48, 0.96	0.054
1	rs12044149	IL-23R	1.34	0.88, 2.06	0.167	1.60	1.07, 2.39	0.021

Table 2. Performance of the genetic assay in predicting PsA

2A. Prediction of PsA at baseline (N=78)

Method	TP	TN	FP	FN	Accuracy	Sensitivity	Specificity	AUC
Logistic Regression	12	242	8	66	0.77	0.15	0.97	0.62
Naïve Bayes	27	203	47	51	0.70	0.35	0.81	0.61
Random Forest	14	237	13	64	0.77	0.18	0.95	0.56

2B. Prediction of PsA at 1 year (N=95)

Method	TP	TN	FP	FN	Accuracy	Sensitivity	Specificity	AUC
Logistic Regression	15	218	15	80	0.71	0.15	0.94	0.62
Naïve Bayes	21	203	30	74	0.68	0.22	0.87	0.62
Random Forest	16	204	29	79	0.67	0.17	0.88	0.55

Conclusion: Despite the association of several genetic markers with PsA, genetic testing has marginal effect on predicting a diagnosis of PsA among patients with psoriasis and musculoskeletal symptoms.

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SAT0415 AGE RELATIONSHIP WITH ULTRASOUND ARTICULAR AND ENTHESEAL INVOLVEMENT IN PSORIATIC ARTHRITIS: CROSS-SECTIONAL STUDY

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Background: Detection of subclinical enthesitis and synovitis in psoriatic arthritis (PsA) is prevalent and ultrasound (US) examination is informative tool for it diagnosing. Aging positively affects degenerative changes.

Objectives: To study relationship between US articular and enthesal findings with age in patients with PsA.

Methods: 57 patients were enrolled to study with fulfilled PsA criteria (CASPAR, 2009). Data collection: demographical, clinical (current psoriasis, axial