Cross-Sectional Analysis of Subclinical Arthritis Based on Family History-Based Risk Score (FRS)

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Background

Subclinical psoriatic arthritis (PsA) represents a critical window for early intervention, yet its defining clinical and ultrasonographic features remain poorly characterized. Family history of psoriatic disease is a well-established risk factor, but its association with subclinical phenotypes remains underexplored.

Purpose

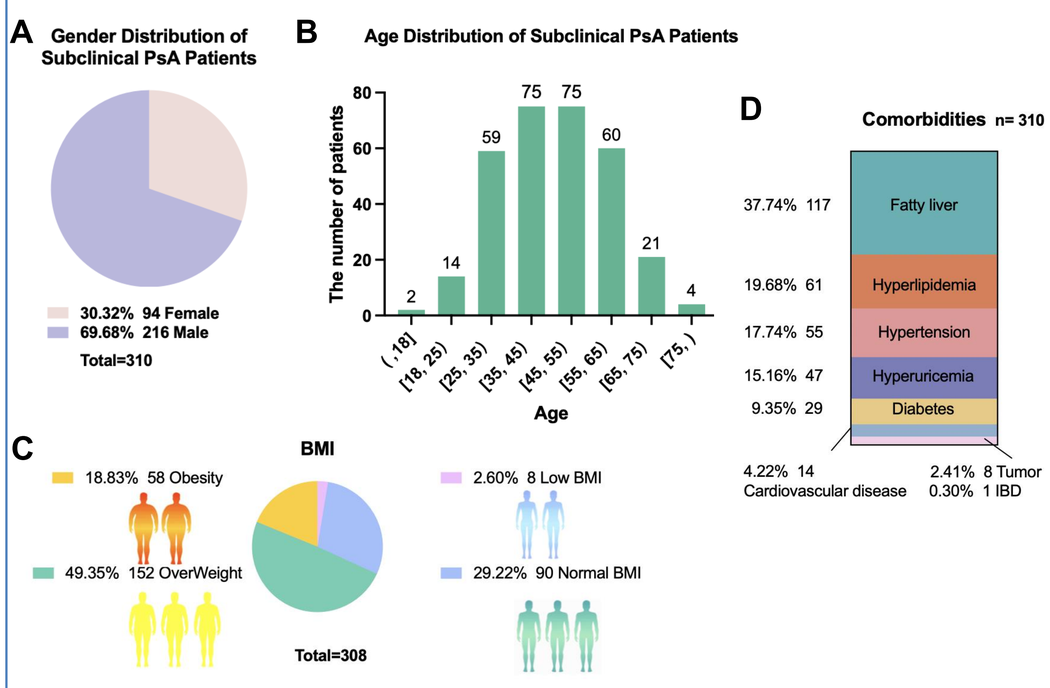
This cross-sectional study aims to systematically characterize the clinical and ultrasonographic features of subclinical psoriatic arthritis (PsA) patients and analyze the similarities and differences across various dimensions among patients with different levels of familial risk (quantified by FRS).

Methods

This cross-sectional study was based on the baseline data from the Subclinical Psoriatic Arthritis Cohort of West China Hospital (SPAWCH) database. The SPAWCH database, which defines subclinical PsA according to 2023 EULAR criteria (psoriasis patients with arthralgia and/or ultrasound evidence of synovial/entheseal inflammation without clinical synovitis), was established in March 2024. We developed a Family Risk Score (FRS) based on weighted family history from the prospective subclinical PsA database at West China Hospital (enrolling patients since March 4, 2024). Eligible participants were diagnosed with subclinical PsA during dermatology outpatient visits and provided informed consent. An FRS was constructed by assigning weights to 1st-, 2nd-, and 3rd-degree relatives (2, 1, and 0.5 points, respectively) with PsA, psoriasis (PsO), or other immune diseases (2, 1.5, and 1 points, respectively).

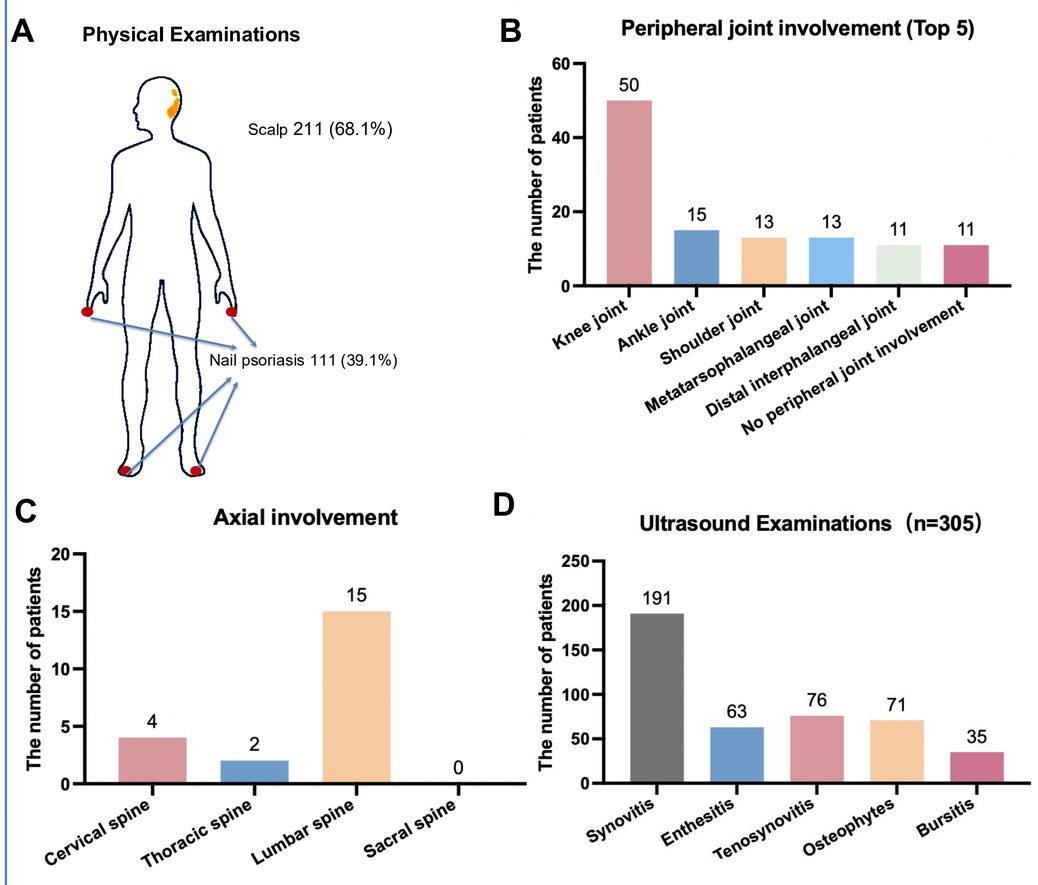
Results

Figure 1: The demographic and clinical information of patients with subclinical PsA (n=310).



The 310 subclinical PsA patients showed male predominance (69.68%) and a young-to-middle-aged distribution. Metabolic abnormalities were prevalent, with 68.18% overweight/obese. Top comorbidities included fatty liver, hyperlipidemia, confirming a significant metabolic burden in early PsA.

Figure 2: Scalp/Nail Involvement, joint manifestations and characteristic ultrasound findings



This subclinical PsA cohort showed frequent scalp (68.1%) and nail involvement, with predominant knee (peripheral) and lumbar (axial) symptoms. Synovitis was the most common ultrasonographic finding (62.6%).

Table 1. The Clinical and sonographic characteristics among patients with subclinical PsA

Variables	Subclinical PsA n=310	High FRS n=47	Low FRS n=263	*P* value
Age, years	45.17 ± 13.53	46.57 ± 14.27	44.92 ± 13.4	0.46
Gender, male	216 (69.7%)	28 (59.6%)	188 (71.5%)	0.14
Ethics, Han	303 (97.7%)	44 (93.6%)	259 (98.5%)	0.13
BMI*, kg/m2	24.75 ± 3.56	24.29 ± 3.7	24.83 ± 3.54	0.35
BMI<23	98 (31.71)	17 (36.2%)	81 (31%)	0.60
Overweight (23≤BMI<27.5)	152 (49.4%)	23 (48.9%)	129 (49.4%)	1.00
General obesity (27.5≤BMI)	58 (18.8%)	7 (14.9%)	51 (19.5%)	0.58
Smoking status, never smoke	168 (54.2%)	31 (66%)	137 (52.1%)	0.30
Drinking status, never drink	126 (40.8%)	19 (40.4%)	107 (40.8%)	0.17
Psoriasis status				
Age of onset, years	28.53 ± 14.43	24.63 ± 14.2	29.2 ± 14.39	**0.06**
Duration of psoriasis, years	14.89 ± 11.19	19.64 ± 11.98	14.07 ± 10.86	**0.01**
PASI	4.88 ± 4.6	4.37 ± 4.82	4.96 ± 4.57	0.48
BSA, %	6.1 ± 8.66	4.98 ± 9.26	6.3 ± 8.56	0.41
Peripheral joint involvement (Top 5)				
Knee joint	50 (16.1%)	10 (21.3%)	40 (15.2%)	0.41
Ankle joint	15 (4.8%)	3 (6.4%)	12 (4.6%)	0.87
Shoulder joint	13 (4.2%)	4 (8.5%)	9 (3.4%)	0.23
Metatarsophalangeal joint	13 (4.2%)	3 (6.4%)	10 (3.8%)	0.68
Distal interphalangeal joint	11 (3.5%)	2 (4.3%)	9 (3.4%)	1.00
Axial involvement				
Cervical spine	4 (1.3%)	0 (0%)	4 (1.5%)	0.88
Thoracic spine	2 (0.6%)	0 (0%)	2 (0.8%)	1.00
Lumbar spine	15 (4.8%)	4 (8.5%)	11 (4.2%)	0.37
Sacral spine	0 (0%)	0 (0%)	0 (0%)	1.00
Symptoms				
Pain	101 (32.6%)	19 (40.4%)	82 (31.2%)	0.28
Joint pain VAS	2.59 ± 2.31	2.69 ± 2.11	2.57 ± 2.36	0.82
Stiffness	21 (6.8%)	4 (8.5%)	17 (6.5%)	0.84
Soreness	24 (7.7%)	4 (8.5%)	20 (7.6%)	1.00
Fatigue	11 (3.5%)	1 (2.1%)	10 (3.8%)	0.89
Morning stiffness severity VAS	0.65 ± 1.57	0.68 ± 1.67	0.65 ± 1.56	0.93
Morning stiffness duration	1.85 ± 5.57	0.82 ± 2.38	2.06 ± 6.02	0.11
Ultrasound	n=305	n=46	n=259	
Enthesitis	63 (20.7%)	9 (19.6%)	54 (20.8%)	1.00
Synovitis	191 (62.6%)	27 (58.7%)	164 (63.3%)	0.67
Bursitis	35 (11.5%)	6 (13%)	29 (11.2%)	0.91
Tenosynovitis	76 (24.9%)	13 (28.3%)	13 (28.3%)	0.70
Osteophytes	71 (23.3%)	13 (28.3%)	58 (22.4%)	0.50
Comorbidities				
Hypertension	55 (17.7%)	11 (23.4%)	44 (16.7%)	0.37
Cardiovascular disease	14 (4.5%)	3 (6.4%)	11 (4.2%)	0.77
Diabetes	29 (9.4%)	3 (6.4%)	26 (9.9%)	0.63
Hyperlipidemia	61 (19.7%)	14 (29.8%)	47 (17.9%)	**0.09**
Fatty liver	117 (37.7%)	16 (34%)	101 (38.4%)	0.69
Hyperuricemia	47 (15.2%)	5 (10.6%)	42 (16%)	0.47
Inflammatory bowel disease	1 (0.3%)	0 (0%)	1 (0.4%)	1.00
Tumor	8 (2.6%)	2 (4.3%)	6 (2.3%)	0.76

Categorical variables are expressed as n (%), and continuous variables are represented as mean (standard deviation) or median (IQR). *The BMI classification follows the recommendations for the Chinese population from WHO. BSA, Body Surface Area; MTX, methotrexate; PASI, Psoriasis Area Severity Index; VAS, Visual Analog Scale.

Conclusions

This study provides insights into the clinical and ultrasound characteristics of patients with subclinical arthritis. An elevated familial risk, quantified by FRS, is specifically associated with prolonged psoriasis duration and metabolic comorbidity trends, but not inflammatory severity in subclinical PsA. Future studies may combine FRS with genetic data to further stratify PsA progression risk.

Acknowledgements

We appreciate all the patients in the SPAWCH cohort.

References

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