

SUPPLEMENTARY MATERIAL

Clinical profile of pulmonary involvement in rheumatological disorders: a cross-sectional study in a rheumatology-associated lung disease clinic

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Key words: connective tissue diseases, interstitial lung disease, systemic autoimmune rheumatic diseases.

Supplementary Table 1. Demographics and clinical characteristics of the study population.

Demographic Characteristics	
Mean Age	44.33 years (range 22-82 years)
Females	144 (84.7%)
Smoking [§]	14 (8.2%)
<i>§ All males : RA(8); IPAF (3); SSc (1); OS(1); SjS (1)</i>	
Rheumatological diseases	n=170(%)
Rheumatoid arthritis	70 (41.2%)
Systemic sclerosis	49 (29%) ^δ
Systemic Lupus erythematosus	7 (4.1%)
Overlap syndrome	11 (6.5%) * ^δ
Sjogren's syndrome	5 (2.9%)
Idiopathic inflammatory myopathy	2 (1.2%) ^δ
Interstitial pneumonia with autoimmune features	26 (15.3%) ^δ
<i>*This includes four cases of Mixed connective tissue disorders(MCTD)</i>	
<i>δ These include cases of ASS</i>	
Chronology of respiratory manifestations	
Preceded other systemic manifestations	23 (13.6%)
RA	5 (2.9%)
SSc	1 (0.6%)
SLE	0
SjS	1 (0.6%)
IIM	0
OS	0
IPAF	16 (9.4%)
Concurrent with systemic manifestations	29(17%)
RA	2 (1.2%)
SSc	13 (7.6%)
SLE	0
SjS	1 (0.6%)
IIM	1 (0.6%)
OS	2 (1.2%)
IPAF	10 (5.9%)
<i>*One case of MCTD</i>	
Succeeded systemic manifestations	118 (69.4%)
RA	63 (37.1%)
SSc	34 (20%)
SLE	7 (4.1%)
SjS	3 (1.8%)
IIM	1 (0.6%)
OS	9 (5.3%)
IPAF	0
Clinical features(Not mutually exclusive)	
Inflammatory polyarthritis	134 (77%)
Raynaud's phenomenon	78 (45%)
Skin tightening	51 (29%)
Dryness of eyes and mouth	28 (16.1%)
Photosensitivity	19 (11%)
Oral ulcers	23 (13.2%)
Gastroesophageal reflux disease	17 (9.8%)
Digital ulcers	19 (11%)
Muscle weakness	7 (4%)
No extrapulmonary manifestations	5 (2.9%)
Autoantibody profile (Not mutually exclusive)	
Anti nuclear antibody	132 (76%)
Anti rheumatoid factor	112 (64%)

Anti cyclic citrullinated peptide antibody	69 (39.6%)
Anti Scl 70	43 (24.7%)
Anti centromere	4 (2.3%)
Anti La	29 (16.7%)
Anti U1RNP	23 (13.2%)
Anti dsDNA	9 (5.2%)
Anti histone	2 (1.2%)
Anti Smith	2 (1.2%)
Myositis specific autoantibodies	11 (6.3%)
ASS related (Against Jo-1, PL-7, PL-12, EJ)	11 (6.3%)
ASS unrelated (Anti Mi2)	1 (0.6%)
Myositis associated	41 (23.6%)
Anti Ro	32 (18.4%)
Anti Ku	7 (4.3%)
Anti Pm/Scl	3 (1.7%)
Pulmonary function tests performed in the study population	
Spirometry	
Total number of patients who performed the test ^γ	98 (56.5%)
FEV1/FVC ≥70% [^]	90 (52.9%)
a) With FVC ≥80% (Normal)	5 (2.9%)
b) With FVC < 80% (Restrictive pattern)	85 (50%)
FEV1/FVC <70% (Obstructive pattern)	8 (4.7%)
FEF 25-75 <70% (Small airway disease) [□]	7 (4.1%)
^γ Patients with severe pulmonary disease could not perform spirometry [^] FEV1- Forced expiratory volume in one second [^] FVC –Forced vital capacity [□] FEF 25-75 :Forced expiratory flow between 25% to 75%	
Diffusion capacity of Lung for carbon monoxide (DLCO)	
Test performed by ^ε	53 (31.2%)
DLCO/VA <70%	21 (12.4%)
DLCO/VA ≥ 70%	32 (18.8%)
^ε Patients with severe pulmonary disease could not perform DLCO VA- Alveolar volume	
Six minute walk test(6MWT)	
Test performed by [~]	61 (35.9%)
Desaturation ≥ 4%	23 (13.5%)
Desaturation <4%	38 (22.4%)
[~] Patients with severe pulmonary disease or severe joint deformities or muscle weakness could not perform 6MWT	

RA, rheumatoid arthritis; IPAF, idiopathic pneumonia with autoimmune features; SSc, systemic sclerosis; OS, overlap syndrome; SjS, Sjogren's syndrome; MCTD, mixed connective tissue disease; ASS, antisynthetase syndrome; SLE, systemic lupus erythematosus; IIM, idiopathic inflammatory myopathy.

Supplementary Table 2. Clinical profile of specific rheumatologic diseases.

Clinical characteristics of individual rheumatologic diseases				
Rheumatological disease	Number	Mean age with range (years)	Female	Clinical features(%)
Rheumatoid arthritis	70	52.03 (22-82)	83%	Inflammatory polyarthritis(95%); Early morning stiffness(95%); Dryness of eyes and mouth(7%); Swan neck deformity(18.6%); Ulnar drift (12.9%); Z deformity of thumb (6.3%)
Systemic sclerosis	49	39.86 (22-74)	87.8	Skin thickening (94.7%); Raynaud's phenomenon(62.6%); Gastroesophageal reflux (22.7%); Digital ulcers (18.3%); Polyarthritis(13.6%); Acral osteolysis and pseudoclubbing(26.5%); Restricted mouth opening(77.6%); Beaked facies(26.5%)
Systemic lupus erythematosus	7	33.4 (27-44)	100%	Photosensitivity (100%); Oral ulcers (100%); Polyarthritis(100%); Malar rash(42.9%)
Primary Sjogren's syndrome	5	50.8 (28-68)	80%	Dryness of eyes, mouth (100%); Polyarthritis (40%); Raynaud's phenomenon(40%)
Idiopathic inflammatory myopathy	2	40 (37-43)	20%	Muscle weakness (100%)
Overlap syndrome	11	41.23 (26-60)	73.4%	Skin thickening(40%); Raynaud's phenomenon(66.7%); Polyarthritis(46.7%); Oral ulcers(53.3%); Photosensitivity(46.7%); Gastroesopahgeal reflux (26.7%); Dryness of eyes, mouth(46.7%); Muscle weakness (26.7%)
Interstitial pneumonia with autoimmune features	26	61.43 (25-72)	86.9%	Polyarthritis(42.3%); Raynaud's phenomenon(27%); Dryness of eyes, mouth(23%); Muscle weakness (7.7%); Mechanic's hands(0.6%)

Supplementary Table 3. Clinical profile of patients with amino-acyl tRNA synthetase autoantibodies in our study.

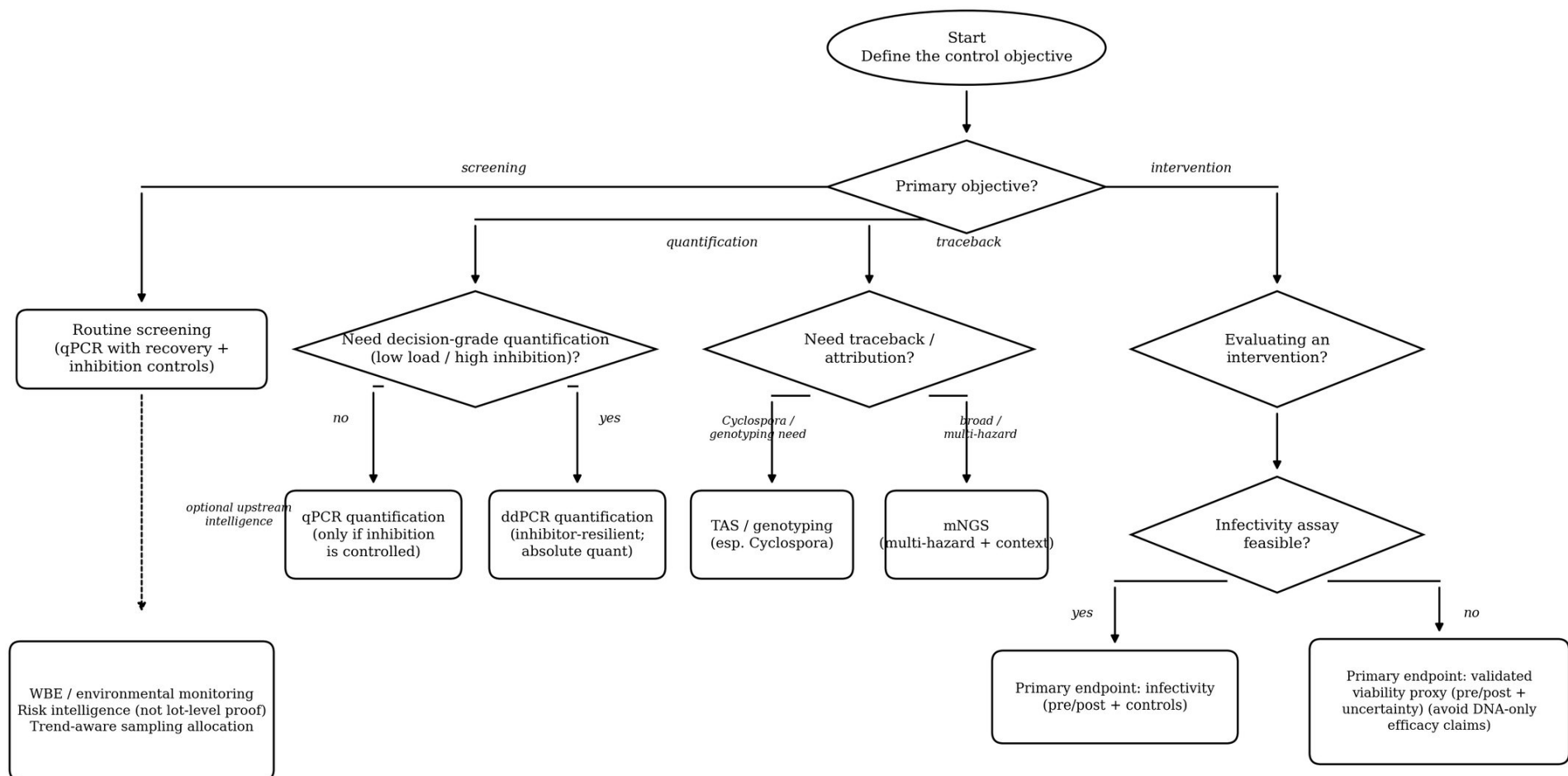
Age/Sex	Clinical features (extrapulmonary)	Initial diagnosis	ASS antibody	HRCT pattern of ILD
59/M	Raynaud's phenomenon, skin thickening	LSSc	Anti Jo-1	UIP
25/F	Raynaud's phenomenon, skin thickening	LSSc	Anti Jo-1	NSIP
50/M	Unexplained fever, myalgia, polyarthralgia	IPAF	Anti PL 12, Anti EJ	NSIP
37/M	Polyarthralgia, proximal muscle weaknessA	Polymyositis	Anti PL 7	NSIP
46/M	Polyarthralgia, proximal muscle weakness	IPAF	Anti Jo 1	NSIP
47/M	Myalgia, inflammatory polyarthriti	IPAF	Anti Jo 1	NSIP
25/F	Myalgia, inflammatory polyarthriti	IPAF	Anti EJ, Anti PL12	NSIP
50/F	Dryness of eyes and mouth	OS	Anti Jo1	UIP
60/M	None	IPAF	Anti Jo1	NSIP
59/F	Mechanic's hands	IPAF	Anti PL7	NSIP
60/F	Unexplained fever	IPAF	Anti PL12	NSIP

ILD, interstitial lung disease; LSSc, limited systemic sclerosis; IPAF, interstitial pneumonia with autoimmune features; OS, overlap syndrome; UIP, usual interstitial pneumonia; NSIP, non-specific interstitial pneumonia.

Supplementary Table 4. Pulmonary involvement and high-resolution computed tomography pattern of interstitial lung disease in the study population.

Pulmonary involvement in the study population*							
Rheumatologic disease	Total	Parenchymal		Airways	Vascular		Pleural [^] ,
		ILD	Infection		PH	Others ^ε ,	
Rheumatoid arthritis	70	56 (80%)	3 (4.3%)	16 (23%)	7 (10%)	1 (1.4%)	2 (3%)
Systemic sclerosis	49	49 (100%)	-	-	20 (40.8%)	-	1 (2%)
Systemic lupus erythematosus	7	1 (14.3%)	2 (28.6%)	-	-	1 (14.3%)	4 (5.7%)
Sjogren's syndrome	5	4 (80%)	-	1 (20%)	-	-	-
Idiopathic inflammatory myopathy	2	2 (100%)	-	-	-	-	-
Overlap syndromes	11	11 (100%)	-	-	2 (18.2%)	-	-
Interstitial pneumonia with autoimmune features	26	26 (100%)	-	-	-	-	-
Total	170	149 (87.6%)	5 (2.9%)	17 (10%)	29 (17.1%)	2 (1.2%)	7 (4.1%)
*Not mutually exclusive							
α Airway involvement seen include small airway disease and bronchiectasis.							
ε Other vascular involvement include one case each of diffuse alveolar haemorrhage (in RA) and pulmonary artery thrombus (in SLE).							
^ All cases had pleural effusion							
Spectrum of HRCT pattern in our study population							
Rheumatologic disease	Total	ILD	NSIP*	UIP*	OP*	LIP*	HP Pattern*
Total number	170	149	112 (75.2%)	22 (14.8%)	7 (4.7%)	5 (3.4%)	3 (2%)
Rheumatoid arthritis	70	56	32 (52.5%)	12 (19.7%)	6 (9.8%)	3 (4.9%)	3 (4.9%)
Systemic sclerosis	49	49	42 (86%)	7 (14%)	-	-	-
Systemic lupus erythematosus	7	1	1 (100%)	-	-	-	-
Sjogren's syndrome	5	4	3 (75%)	-	-	1 (25%)	-
Idiopathic inflammatory myopathy	2	2	2 (100%)	-	-	-	-
Overlap syndromes	11	11	10 (91%)	1 (9%)	-	-	-
Interstitial pneumonia with autoimmune features	26	26	22 (85%)	2 (7.7%)	1 (3.8%)	1 (3.8%)	-

ILD, interstitial lung disease; PH, pulmonary hypertension; RA, rheumatoid arthritis; SLE, systemic lupus erythematosus; NSIP, non-specific interstitial pneumonia; UIP, usual interstitial pneumonia; OP, organizing pneumonia; LIP, lymphocytic interstitial pneumonia; HP, hypersensitivity pneumonitis.



Supplementary Figure1. STROBE Diagram depicting the flow of participants through the study.