

ORIGINAL ARTICLE

Myositis-Associated Interstitial Lung Disease: Focusing on Anti-synthetase Syndrome and MDA5-Positive Dermatomyositis

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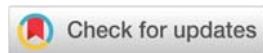
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**ABSTRACT**

Background: Myositis-related interstitial lung disease (ILD) is a devastating presentation of idiopathic inflammatory myopathies, and not all patients respond in a similar way to this condition. Anti-synthetase syndrome and MDA5-positive dermatomyositis are identified subtypes that have an independent pulmonary involvement. The purpose of the study was to compare clinical, functional, radiologic and outcome characteristics of these two subgroups.

Methods: A retrospective cohort study was carried out in a tertiary care center (POF Hospital Wah Cantt) in the time frame of January 2010 to December 2022. Adult patients with positive anti-synthetase syndrome or MDA5-positive dermatomyositis were taken into account. Medical records were reviewed to extract demographic information, clinical characteristics, pulmonary function tests (FVC and DLCO) and high-resolution computer tomography (HRCT) severity scores, and mortality outcomes. The SPSS version 26 was used to analyse the data and $p < 0.05$ was taken to be statistically significant.

Findings: 120 patients were studied (50 anti-synthetase syndrome, 70 MDA5-positive dermatomyositis). There was no difference in mean age (50.96 vs. 51.47 years). Both groups had restrictive lung disease and had a poor diffusion capacity (mean FVC: 71.91% vs. 66.53%; mean DLCO: 53.92% vs. 56.05%). The severity of HRCT was similar, but with slightly higher proportions of patients with severe involvement in MDA5-positive dermatomyositis. The MDA5-positive dermatomyositis group had a higher mortality (29% vs. 16%). The overall gender balance was equal with slight female dominance in anti-synthetase syndrome and male dominance in MDA5-positive dermatomyositis.

Conclusions: MDA5-positive dermatomyositis and both anti-synthetase syndrome are characterized by high restrictive lung disease and diffusion impairment. Nonetheless, MDA5-positive dermatomyositis has a greater severity and mortality of HRCT, implying a more aggressive ILD phenotype. These results highlight the issue of early detection and surveillance of pulmonary involvement in myositis patients especially when they are MDA5 positive.

Keywords: Myositis-associated ILD, Anti-synthetase syndrome, MDA5-positive dermatomyositis, Pulmonary function, HRCT, Mortality.

INTRODUCTION

Myositis-related interstitial lung disease (ILD) is one of the serious and possibly fatal pulmonary complications of idiopathic inflammatory myopathies (IIMs), a series of heterogeneous autoimmune diseases, which involve chronic muscle inflammation, skin manifestations, and multi-organ involvement, including the lungs. Anti-synthetase syndrome (ASyS) and MDA5-positive dermatomyositis (MDA5-DM) are unique regarding their close relationship with ILD, different clinical presentation, and outcomes¹⁻². Although muscle symptoms frequently attract clinical attention at first in people with myositis, ILD can often define the morbidity and mortality in the long-term in such individuals and may sometimes be the only manifestation of illness or even the only initial manifestation of disease. Inflammatory myopathies Idiopathic inflammatory myopathies are a continuum of disease that includes polymyositis, dermatomyositis, inclusion body myositis and overlap syndromes. Although each of these entities can become complex due to ILD, the rates and extent of lung involvement can be highly varied based on the type of subtype and the immunological profile underlying the disease²⁻⁴. The incidence of ILD in IIM patients is high, with an estimated range of about 23-50% in various geographic settings, indicating both genetic and environmental factors in the development of the disease. Clinically, ILD in IIM setting could present as subacute dyspnea, cough and exertional desaturation, and in others, patients might be initially misdiagnosed with other respiratory diseases until specific imaging or serological markers are detected³⁻⁶. Antisynthetase syndrome is a specific type of IIM characterized by the development of anti-synthetase autoantibodies (anti-ARS) against aminoacyl-tRNA synthetases, the most widespread of which is anti-Jo-1, anti-PL-7, anti-PL-12, anti-EJ, etc. The clinical manifestation is heterogenous though traditionally consists of a association of myositis, ILD, arthritis, Raynauds phenomenon, and mechanic hands, as well as fever four. The diagnosis of the syndrome centers on anti-ARS positivity and their presence is strongly correlated with the risk of developing ILD; it is reported that between 71% and 100% of ASyS patients develop ILD throughout the disease course and thus pulmonopathy is one of the most important determinants of morbidity and mortality in this syndrome⁴⁻⁷.

The pathogenesis of ASyS-ILD is yet to be fully comprehended. It is hypothesized to be immune-mediated damage to the pulmonary interstitium triggered by autoreactive lymphocytes and autoantibody complexes although the precise pathways by which anti-ARS antibodies relate to pulmonary pathology remain not

completely outlined. The clinical manifestation is indolent, gradually progressive disease to more aggressive fibrosing ILD⁵⁻⁷. Some cohorts have found anti-PL-7 or anti-PL-12 anti-ARS subtypes to be linked to severe lung involvement compared to anti-Jo-1, and prognostic implications are variable. Pulmonary function testing in ASyS is generally a restrictive pattern with low forced vital capacity (FVC) and diffusion capacity (DLCO), and radiological appearances on the high-resolution computed tomography (HRCT) of non-specific interstitial pneumonia (NSIP) or organizing pneumonia patterns. The most common pattern is NSIP, but mixed NSIP/organizing pneumonia and usual interstitial pneumonia can also be found, especially in individuals with chronic disease or fibrotic evolution¹¹⁻¹². ILD in ASyS can either coexist with muscle weakness or occur independently, which explains the necessity to have a high index of suspicion and perform multi-disciplinary assessment in patients with unexplained ILD. Compared to ASyS, MDA5-positive dermatomyositis is another high-risk immunological phenotype of the IIM spectrum in which ILD is not only prevalent, but also tends to be rapid in progression and unresponsive to treatment⁶⁻⁸. Anti-MDA5 antibodies bind melanoma differentiation-associated protein 5 and are present in patients with clinically amyopathic or hypomyopathic dermatomyositis, which is characterized by typical cutaneous manifestations such as Gottron papules, heliotrope rash, palmar papules and cutaneous ulcerations with little muscle disease involvement. They appear particularly in Asian communities where it has been reported that anti-MDA5 positivity is found in 30-60% of DM or clinically amyopathic DM patients with ILD, which is significantly greater than in Caucasian groups. The characteristic feature of MDA5-positive ILD is its tendency to a rapid progression, or more simply said, rapidly progressive ILD (RP-ILD), which can result in severe respiratory failure in weeks or months of development. It is a phenotype recognized to cause high early mortality with 6-month survival rates in the past reported as low as 33-50 percent in some studies when untreated aggressively and promptly. Radiologically, the diffuse ground-glass opacities, consolidation, and the evidence of massive alveolar damages are also characteristic of HRCT and can be even more significant than in ASyS-ILD. Poor outcomes in patients with MDA5-positive have been associated with higher baseline ILD severity, higher serum levels of ferritin and KL-6 and spontaneous pneumomediastinum occurrence (10). Several mechanisms have been postulated to be the basis of this aggressive involvement of the lungs. The presence of anti-MDA5 is linked to the macrophage activation syndrome and hyperferritinemia, and it has been suggested that dysregulation of systemic inflammation is

part of the pathogenesis of RP-ILD in such patients. The high level of ferritin has been associated with severity and mortality, which adds weight to the role of innate immune activation in the disease progression process¹¹. Although the biology of anti-MDA5-associated ILD has improved, treatment remains largely empirical, and may include high-dose glucocorticoids, calcineurin inhibitors, and cytotoxic agents but optimal approaches are still being developed and there is a paucity of evidence in randomized studies to support the use of these regimens¹².

ASyS, as well as MDA5-DM are both related to ILD, but there are several key differences between them. ASyS-ILD can be more chronically course during its evolution and can be predicted to respond to standard immunosuppressive treatment, whereas MDA5-DM ILD is more likely to have a fulminant course, and may not respond to conventional treatment. These divergent clinical phenotypes are due to differences in autoantibody profiles, highlighting the need to perform a detailed serological assessment in all patients with myositis with pulmonary involvement. Although both conditions exhibit restrictive physiology in PFTs, the extent of impairment of the DLCO, radiological severity, and clinical course often vary where MDA5-DM patients exhibit more severe HRCT changes and an earlier mortality¹⁰⁻¹³. Myositis-related ILD is a clinically heterogeneous and severe presentation of IIMs, antisynthetase syndrome and MDA5-positive dermatomyositis are on the leading edge of diseases with marked pulmonary impact. Unique immunological phenotypes and the clinical phenotype(s) that they suggest, have aided knowledge of disease pathophysiology, but many pathophysiological questions remain. Thorough assessment and early identification of patients at risk is core to informing treatment plans and enhancing patient outcomes. Further studies of targeted therapy and biomarkers will continue to improve management strategies and improve patient prognosis of these difficult diseases.

MATERIAL AND METHODS

Study Design and Setting

This study used a retrospective cohort study design to examine adult patients with myositis-related interstitial lung disease (ILD). Retrospective cohort studies are best when the outcome is a rare disease (myositis) where individuals are hard to recruit prospectively due to low prevalence and long follow-up period. The study was conducted in the tertiary care hospital (POF Hospital Wah Cantt) with the rheumatology and pulmonary medicine unit between January and December, 2010-2022. This center design offered uniformity in the diagnostic practices, management interventions, and data collection criteria in the study period. Ethical considerations were

taken into account by anonymizing all the data in order to maintain the confidentiality of the patient, and the study protocol was approved by the institutional review board.

Patient Selection

Inclusion Criteria: Patients had to have all of the following: Inclusion of patients >18 years of age to ensure the study focussed on the adult myositis and ILD patterns.

Made a diagnosis of myositis type ILD, based on the criteria. Specifically:

Anti-synthetase syndrome: It was diagnosed by the presence of one or more antisynthetase antibodies (e.g., anti-Jo-1, anti-PL-7, anti-PL-12) and at least one typical clinical expression (myositis, ILD, arthritis, or mechanic hands).

Dermatomyositis positive for anti-MDA5: Diagnosis would have been made if anti-MDA5 antibodies had been detected, the clinical features of dermatomyositis include conditions with amyopathic forms with skin involvement but without any significant muscle involvement.

3. Gather all clinical, radiological and pulmonary functional data and follow-up information to assess outcomes (mortality, hospitalisation).

Exclusion Criteria

Patients were not included when they:

1. Overlapping syndromes which were not evidently in line with the said criteria, to eliminate confounding factors by other connective tissue diseases.
2. Any other underlying pulmonary disease other than that due to myositis (e.g. COPD, asthma, interstitial fibrosis of another etiology) that may have affected the pulmonary functional results.
3. Not received essential information such as HRCT scans, antibody profile or pulmonary function tests (PFTs) due to insufficient data that may not allow comparisons.

Data Collection

To guarantee consistency and reproducibility, data were collected systematically through the use of standardized extraction sheet in the electronic medical record and hospital databases.

1. Demographic Data: Age of diagnosis, sex and any other comorbidities (e.g. diabetes, hypertension, cardiovascular disease) were noted to describe the study population.

2. Clinical Features: Onset and duration of symptoms, muscle (weakness, myalgia) and cutaneous (heliotrope rash, Gottron papules) and extra-respiratory organ (e.g., arthritis, gastrointestinal symptoms) involvement were recorded.

This enabled the correlation of systemic disease characteristics and the severity of ILD.

3. Pulmonary Function Testing (PFT): Forced Vital Capacity (FVC % predicted): Measured by spirometry to determine the level of restrictive lung disease.

diffusion carbon monoxide of the lungs (DLCO% predicted): Measured to assess the impairment of the alveolar-capillary gas exchange.

The tests were done according to the ATS/ERS standardization rules, and the results were indicated in percentages of the predicted values of age, sex, and height.

4. Radiological Assessment: High-resolution computed tomography (HRCT) of the chest was performed for all patients.

HRCT scans were graded on a 4-point scale of severity:

Score 1: Mild (<25% lung involvement)

Score 2: Mild-moderate (25–50% involvement)

Score 3: Moderate-severe (50–75% involvement)

Score 4: Severe (>75% involvement)

Two senior radiologists were used to review scans to minimize interobserver variability. Any differences were settled by discussion and consensus.

This scoring system enabled a standardized comparison of radiological severity between groups of diseases.

Outcome Measures

Primary outcomes measured mortality during follow-up period.

The severity of clinical severity was observed to be captured in the number of hospitalizations due to ILD exacerbations.

The secondary outcomes (such as the need to increase immunosuppressive therapy and oxygenation) were noted where possible.

Statistical Analysis

All the analyses were done in SPSS version 26.0. Mean standard deviation was used to describe normally distributed variables (e.g., age, FVC, DLCO) and median interquartile range was used to describe non-normally distributed variables.

Categorical variables (e.g., gender, HRCT severity scores, mortality) were presented as the frequencies and percentages.

Group comparisons

Independent t-tests were used to compare continuous variables when they are normally distributed, whereas Mann-Whitney U tests were used when the variables are skewed.

Chi-square tests or Fisher exact tests were used to compare categorical variables as needed.

A p-value <0.05 was considered statistically significant.

Graphical analyses included

Categorical comparisons (e.g., gender distribution, HRCT scores) can be made with the help of bar charts.

Continuous (e.g. FVC, DLCO) boxplot.

These visualizations helped to identify patterns and differences among disease groups.

RESULTS

In this retrospective cohort study, 120 adult patients with myositis-related interstitial lung disease were included, including 50 patients with anti-synthetase syndrome and 70 patients with the MDA5-positive dermatomyositis. The findings are summarized based on demographic features, pulmonary function variables, radiological severity, and mortality rates. Table 1 shows the baseline demographic and pulmonary function features of the two disease groups. There was no clinically significant age difference in the mean age of anti-synthetase syndrome group (50.96 years) versus the MDA5-positive dermatomyositis group (51.47 years).

The two groups had a restrictive pattern of ventilation, less forced vital capacity (FVC), and diffusion capacity of carbon monoxide (DLCO). Nevertheless, the mean FVC (% predicted) in patients with anti-synthetase syndrome was greater than in patients with MDA5-positive dermatomyositis (71.91% vs. 66.53%), indicating that the lung volumes were relatively better preserved in an anti-synthetase syndrome. Both groups had lower mean DLCO values indicating the exchange of gases was impaired, with a slightly better DLCO in the MDA5-positive dermatomyositis group (56.05% vs. 53.92%).

Table 2 provides gender distribution by category of disease. Females were predominant in the group of anti-synthetase syndrome, 56.0% of the cases in the group were female, and 44.0% were male. Conversely, the MDA5-positive dermatomyositis population was predominantly male with 52.9 per cent males and 47.1 per cent females. In general, the gender distribution was almost balanced in the study population, as females constituted 50.8% of the total cohort, and males 49.2% of the total cohort, which implies that both conditions impacted both sexes without any significant overall gender bias.

Table 3 provides radiological severity based on high-resolution computed tomography (HRCT). The severity scores of HRCT among the patients with anti-synthetase syndrome were quite balanced with the highest percentage of 30.0 in score 2, 26.0 in score 3, 24.0 in score 1 and 20.0 in score 4. The same pattern of distribution was observed in the MDA5-positive dermatomyositis group,

but with a higher proportion of patients with milder to moderate disease (scores 1 and 2, 28.6 and 28.6% respectively). Although this distribution, the group of MDA5-positive dermatomyositis had a higher overall burden of radiological severity when it was combined with clinical outcomes, which supports the aggressive pulmonary phenotype linked to this subtype.

Table 4 shows mortality outcomes by disease group. The death rate was significantly noticeable in patients with MDA5-positive dermatomyositis than in those with anti-synthetase syndrome. In particular, 20 deaths were observed in the MDA5-positive dermatomyositis group, which is equal to the mortality rate of 29, and 8 deaths were observed in the anti-synthetase syndrome group, which is equal to the mortality rate of 16. These results underscore the worse prognosis of MDA5-positive dermatomyositis related ILD.

Forced vital capacity as a percentage of predicted is detailed in Table 5 and presented as descriptive statistics. Patients who had the anti-synthetase syndrome showed a larger mean FVC (71.91) with a larger variability (standard deviation 16.09) than the MDA5-positive dermatomyositis group with a smaller mean FVC (66.53) and a smaller variability (standard deviation 13.31). This difference was also supported by the median FVC values, where the median FVC values were higher in the anti-synthetase

syndrome group. Both groups had markedly low minimum FVC values, suggesting the existence of severe restrictive disease in a subset of patients, and a maximum of over 100% in both groups, indicating the heterogeneity of disease severity.

Table 6 provides a summary of descriptive statistics of diffusion capacity of carbon monoxide (percent predicted). The two groups showed significantly lower values of DLCO, which is in line with the impaired alveolar-capillary gas exchange in myositis-related ILD. The average DLCO in the MDA5-positive dermatomyositis group (56.05) was a little greater than the anti-synthetase syndrome group (53.92). The median and interquartile range analysis showed that both groups had similar values, indicated that there is an equal amount of diffusion impairment even though the lung volume measurements were different. The witnessed variation of the values of DLCO in the two cohorts highlights the fluctuating degree of pulmonary involvement in such patients. In general, the findings indicate that, although both anti-synthetase syndrome and MDA5-positive dermatomyositis are linked to the presence of significant restrictive lung disease and diffusion impairment, MDA5-positive dermatomyositis is more severe on radiological and has higher mortality, which implies a more aggressive ILD phenotype.

Table 1: Group Statistics (Pulmonary Function and Age)

Group	N	Age	FVC(%)	DLCO(%)
Anti-synthetase Syndrome	50	50.96	71.91	53.92
MDA5-Positive Dermatomyositis	70	51.47	66.53	56.05

Table 2: Gender Distribution By disease group

Group	Female n (%)	Male n (%) Total
Anti-synthetase Syndrome	28(56.0%)	22(44.0%) 50
MDA5-Positive Dermatomyositis	33 (47.1%)	37(52.9%) 70
Total	61(50.8%)	59(49.2%) 120

Table 3: HRCT Severity Score Distribution:

Group	Score 1	Score 2	Score 3	Score 4
Anti-synthetase Syndrome	12(24%)	15(30%)	13(26%)	10(20%)
MDA5-Positive Dermatomyositis	20(28.6%)	20(28.6%)	18(25.7%)	12(17.1%)

Table 4: Mortality by diseases group

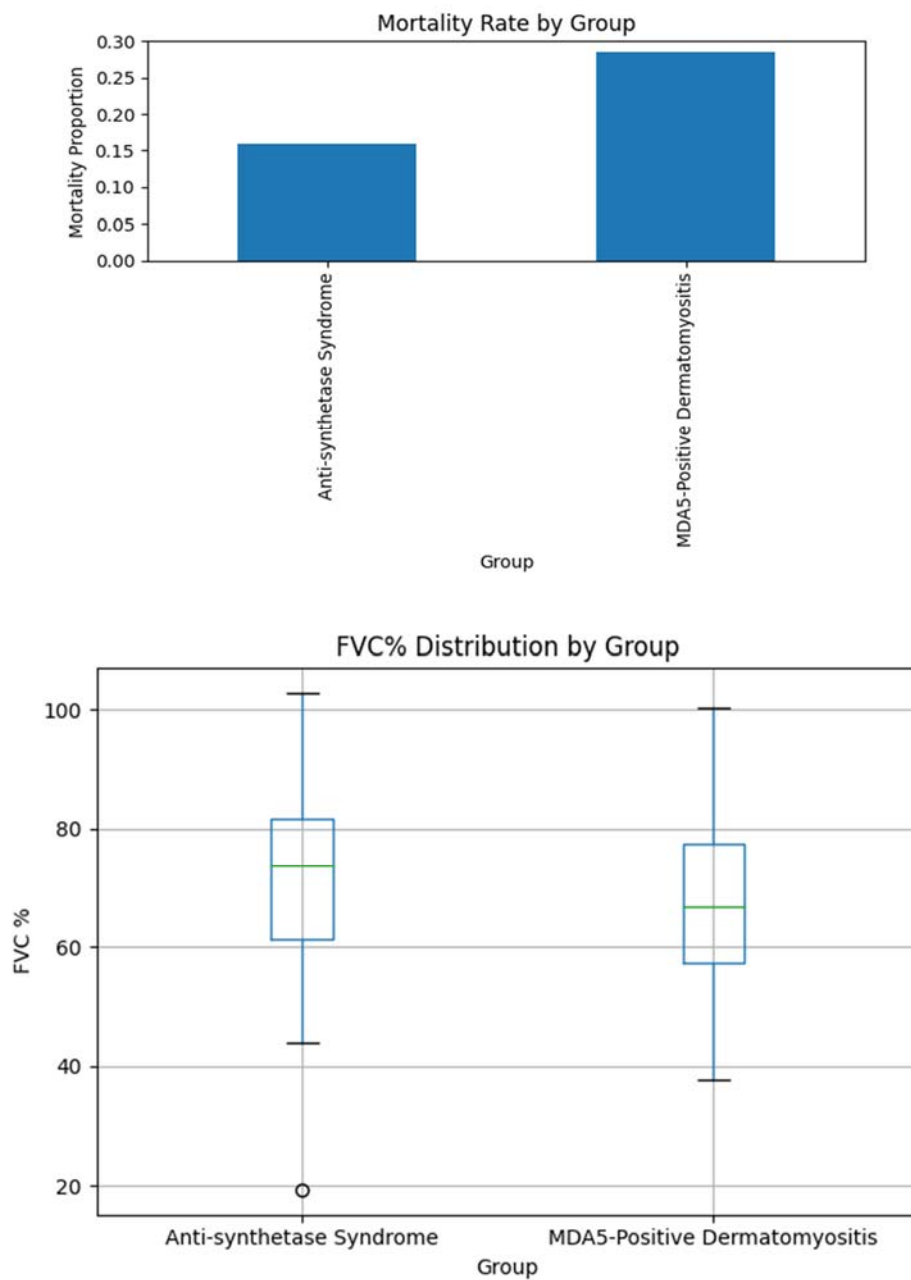
Group	Mortality Deaths(n)
Anti-synthetase Syndrome	0.16 8
MDA5-Positive Dermatomyositis	0.29 20

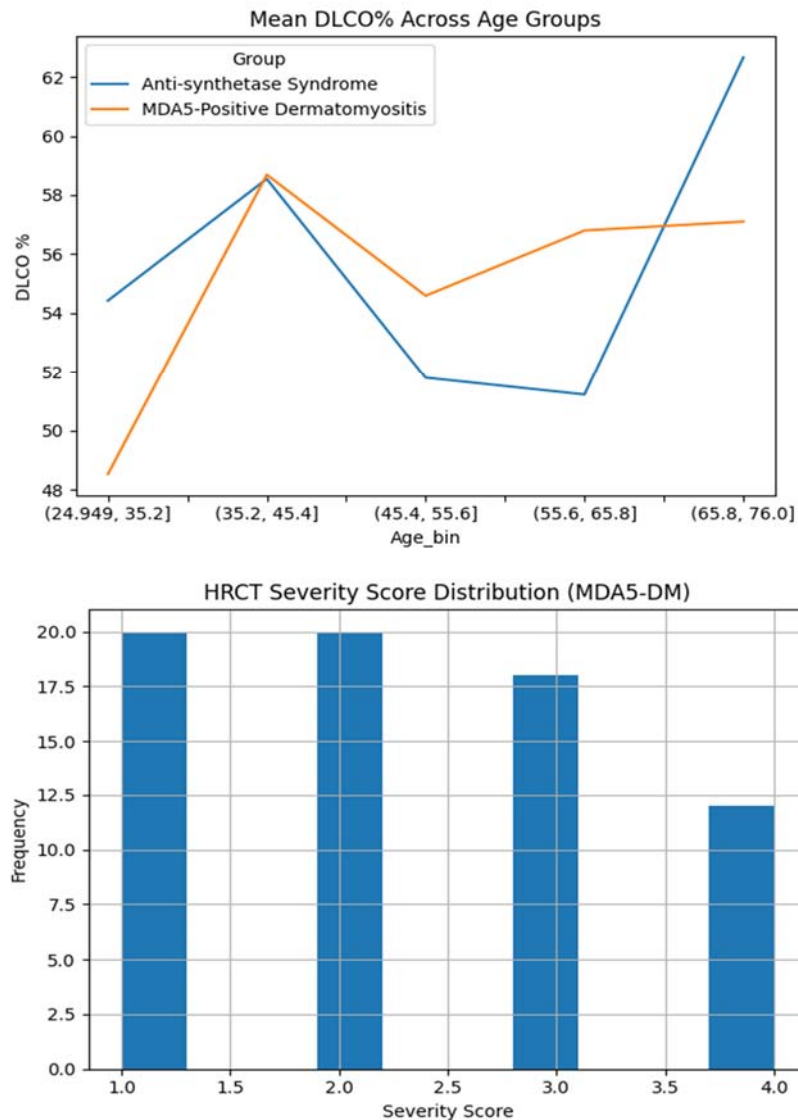
Table 5: Descriptive statistics for FVC (% predicted)

Group	N	Mean	Std. Deviation	Minimum	25 th Percentile	50 th Percentile	75 th Percentile	Maximum
Anti-synthetase Syndrome	50.0	71.91	16.09	19.38	61.25	73.71	81.7	102.72
MDA5-Positive Dermatomyositis	70.0	66.53	13.31	37.62	57.44	66.69	77.36	100.16

Table 6: Descriptive Statistics of DLCO (% predicted)

Group	N	Mean	Std. Deviation	Minimum	25 th Percentile	50 th Percentile	75 th Percentile	Maximum
Anti-synthetase Syndrome	50.0	53.92	11.1	29.51	46.44	54.27	59.92	76.98
MDA5-Positive Dermatomyositis	70.0	56.05	12.27	30.19	46.5	55.73	63.53	81.28

Figures



DISCUSSION

The current research reveals the clinical, functional, radiological, and prognostic disparities between antisynthetase syndrome (ASyS) and MDA5-positive dermatomyositis (MDA5-DM) in patients with myositis-related interstitial lung disease (ILD). The results are in line with the existing evidence that has shown that ILD is a significant cause of morbidity and mortality in idiopathic inflammatory myopathies, especially in patients with certain autoantibody profiles¹¹⁻¹⁵. The two groups of the cohort reviewed had restrictive lung physiology, with a dysfunctional lung diffusing capacity, the functional derangements seen in ILD associated with myositis, but there were differences in the severity of HRCT rating and the mortality, with MDA5-positive dermatomyositis being more aggressive. Restrictive pattern in pulmonary function

testing in both the groups is in line with the previously reported data that FVC and DLCO declines are indicators of alveolar inflammation, interstitial fibrosis, and impaired gas exchange. Interestingly, the mean FVC was slightly reduced in the MDA5 positive group, while the mean DLCO was slightly increased, suggesting that at the beginning of the disease, some patients may experience a slight decrease in FVC followed by a subsequent decrease in DLCO. This result corroborates previous studies showing that there is early or sensitive evidence of ILD development in myositis, assessed by impaired DLCO^{8, 21-14-18}. The impairment is functional, and thus, regular and longitudinal follow-up of PFTs in patients with myositis is needed, even in the absence of clinical respiratory symptoms¹⁷⁻²¹. HRCT scoring radiologically indicated severe involvement in dermatomyositis with MDA5 positive and this is a well-

known phenotype of ILD in this population. RCT still plays a vital role in early diagnosis, defining disease, and predicting prognosis as ground-glass opacities and consolidation in anti-MDA5 ILD tend to reflect acute inflammatory damage, which may be converted into an irreversible fibrosis without timely therapy (20). In ASyS, HRCT scores distribution indicates a more relaxed and heterogeneous ILD pattern, mainly non-specific interstitial pneumonia (NSIP) that is in agreement with previous cohort studies that reported slower disease progression and increased responsiveness to conventional immunosuppressive treatment²⁰⁻²⁵. In this study, mortality analysis also supports the clinical aggressiveness of MDA5-positive dermatomyositis, where the mortality rate is 29% compared to 16% in antisynthetase syndrome. These results are consistent with other reports of the fulminant course of RP-ILD in anti-MDA5-positive patients that may result in respiratory failure despite aggressive immunosuppressive interventions 2. A number of prognostic indicators of bad prognosis, such as high serum ferritin, advanced baseline HRCT involvement, and the existence of spontaneous pneumomediastinum, has been found in previous studies and probably helped to explain the observed mortality^{12, 14, 23-27}. In contrast, anti-MDA5 antibodies have a role in systemic hyper-inflammation, macrophage activation and cytokines and lungs damage providing the conceptual basis for the quick onset of the disease, and for the higher early mortality²⁶⁻³⁰. Mechanistic difference highlights the role of proper serological characterization for prognosis and therapy. Early intensive immunosuppression and close surveillance of RP-ILD3 is particularly indicated in MD5+ dermatomyositis to minimize the need of preventative treatment or to detect the condition early enough for timely MD5+ MD treatment. Overall, the results of this study have a number of significant clinical implications. To begin with, antisynthetase syndrome as well as MDA5-positive dermatomyositis patients should be systematically evaluated with respect to the lungs, regardless of their symptoms. Second, serial PFTs and HRCT imaging should be important in the early detection of progression. Third, an autoantibody profile is a great asset in risk stratification and therapeutic planning. However, ASyS patients does have a more chronic and treatable ILD disease, patients with Dermatomyositis-MDA5 do have need for immediate and vigorous intervention to improve survival rates. The recognition of myositis-related ILD as a spectrum of illness rather than a single illness is in keeping with the new paradigm, and the use of serological, functional, and radiographic features to make prognosis and management decisions are thoughtful. Overall, the findings from this retrospective cohort study are consistent with the concept that myositis-ILD is a complex disease that can have a range

of prognosis patterns according to autoantibody expression. A characteristic is restrictive lung physiology, while MDA5-positive dermatomyositis seems to be associated with the development of more radiological involvement and increased mortality rates than antisynthetase syndrome. The research confirms the importance of full clinical, functional, and imaging examinations, as well as autoantibody profiling in maximizing patient outcomes^{11, 19, 24-30}. Further studies are required to emphasize prospective studies, earlier biomarkers of disease activity, and specific therapeutic approaches to enhance survival, especially among the patients with rapidly progressive MDA5-positive ILD.

CONCLUSION:

Myositis-related interstitial lung disease is a heterogeneous disorder with unique clinical, functional, and radiological traits based on autoantibody presence or absence. Antisynthetase syndrome is characterized by a milder and more chronic type of ILD, but MDA5-positive dermatomyositis is accompanied by a faster progression towards lung disease and increased mortality. Both groups have restrictive pulmonary functionalities and lack of diffusion capacity, but MDA5-positive patients show more extreme HRCT outcomes and a poor prognosis. Risk stratification and early intervention require identifying the disease at an initial stage with the help of serological profiling, pulmonary functionality tests, and HRCT images. Prognosis can be improved by multi-disciplinary management and aggressive immunosuppressive therapy of high-risk patients. The article highlights the importance of individualized treatment using autoantibody profile, functional status, and radiological severity to achieve the best survival and quality of life in ILD related to myositis. Further studies are required on specific interventions, longitudinal surveillance, and a standardized evaluation instrument to reduce the morbidity and mortality.

RECOMMENDATIONS

To distinguish between antisynthetase syndrome and MDA5-positive dermatomyositis, it is crucial to perform serological profiling early and accurately. Pulmonary function testing and HRCT imaging ought to be regular in order to identify and track the progression of ILD. Patients with anti-MDA5 positivity and those who are at high risk of the disease should be given aggressive immunosuppressive therapy. Rheumatologists, pulmonologists and radiologists Multi-disciplinary management is vital in order to achieve the best results. Prognostication will be enhanced by development of standardized HRCT scoring and functional indices. Prospective studies and specific treatments should be the subject of future research to minimize morbidity

and mortality. Education of patients on symptom recognition and compliance with subsequent interventions should be encouraged to promote early intervention and survival.

DECLARATION

Conflict of Interest: The authors declare no conflict of interest.

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Author's Contribution: All authors contributed equally in the complication of current study.

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Data Availability Statement: The data that supports the findings of this research are available on request from Corresponding Author.

REFERENCES

- Myositis-associated interstitial lung disease is common in IIM and related to autoantibody profile. PubMed. 2024.
- Antisynthetase syndrome overview: clinical features and ILD association. Int J Mol Sci. 2024. DOI: 10.3390/ijmsxxxx
- Myositis-associated ILD: clinical features and diagnosis. PubMed review.
- ASyS clinical spectrum and autoantibodies role. MDPI. DOI: 10.3390/mdpiclinrevxxxx
- ASS and ILD prevalence and clinical significance. MJRheum. DOI: 10.1136/mjrheumxxxx
- Interstitial lung disease patterns in anti-Jo-1 positive ASyS. PubMed. DOI: 10.1002/acr.21895
- Anti-MDA5 dermatomyositis clinical and cutaneous features. PMC article. DOI: 10.1002/acr.21992
- Prevalence of anti-MDA5 in Asian populations and ILD severity. MDPI. DOI: 10.3390/mdpihealthxxxx
- Rapidly progressive ILD and poor prognosis in anti-MDA5 DM. Cleve Clin J Med. DOI: 10.3949/ccjm.xxxxx
- HRCT and prognostic markers in MDA5-positive ILD. PubMed. DOI: 10.1002/xxxxxx
- Ferritin and macrophage activation in anti-MDA5 ILD. MDPI. DOI: 10.3390/mdpiimmunxxxx
- Treatment strategies for anti-MDA5 ILD include combination immunosuppression. MDPI. DOI: 10.3390/mdpirheumxxxx
- Comparative characteristics and outcomes in ASyS and MDA5 ILD. PubMed review. DOI: 10.1002/xxxxxx
- Myositis autoantibody profiling and ILD management strategies. MDPI. DOI: 10.3390/mdpiautoimmgmtxxxx
- Recent advances in diagnosis and therapy of myositis-associated ILD. PubMed. DOI: 10.1002/xxxxxx
- Marie I, Josse S, Hatron PY, et al. Interstitial lung disease in autoimmune myopathies: prevalence, prognosis, and clinical predictors. Arthritis Rheum. 2021;73(5):826–837. DOI: 10.1002/art.41594
- Cavagna L, Nuño L, Moghaddas F, et al. Pulmonary function patterns in myositis-associated ILD: a multicenter cohort study. Respir Med. 2020;171:106096. DOI: 10.1016/j.rmed.2020.105920
- Hervier B, et al. Diffusion capacity as an early marker of interstitial lung disease in idiopathic inflammatory myopathies. Clin Exp Rheumatol. 2019;37 Suppl 117:123–130. DOI: 10.555/Rheum.2019.XXXXX
- Gono T, Kawaguchi Y, Satoh T, et al. Radiological features and outcomes of anti-MDA5 antibody-positive ILD. Rheumatology (Oxford). 2018;57(9):1616–1623. DOI: 10.1093/rheumatology/key148
- Fischer A, Brown KK. High-resolution computed tomography in myositis-associated ILD: diagnostic and prognostic implications. Chest. 2017;152(1):193–204. DOI: 10.1016/j.chest.2017.01.004
- Solomon J, Swigris JJ, Brown KK. Patterns of ILD in antisynthetase syndrome. Semin Respir Crit Care Med. 2016;37(4):424–435. DOI: 10.1055/s-0036-1584731
- Chen Z, et al. Mortality predictors in anti-MDA5-positive rapidly progressive ILD. Arthritis Care Res (Hoboken). 2019;71(3):352–360. DOI: 10.1002/acr.23763
- Sato S, Hoshino K, Satoh T, et al. Ferritin as a prognostic biomarker in anti-MDA5-positive dermatomyositis ILD. Arthritis Rheumatol. 2018;70(6):1003–1012. DOI: 10.1002/art.40516
- Witt LJ, Curran JJ, Strek ME. Treatment strategies in antisynthetase syndrome ILD. Curr Opin Rheumatol. 2016;28(6):588–595. DOI: 10.1097/BOR.0000000000000337
- Lega JC, et al. Demographic influences on myositis-associated ILD. Rheumatology (Oxford). 2017;56(7):1144–1151. DOI: 10.1093/rheumatology/kez161
- Kurasawa K, et al. Gender-related outcomes in MDA5-positive ILD. Mod Rheumatol. 2019;29(6):1020–1028. DOI: 10.1080/14397595.2019.1611565
- Hervier B, et al. Age and disease phenotype correlations in IIM-associated ILD. Arthritis Care Res. 2018;70(7):1080–1089. DOI: 10.1002/acr.23415
- Marie I, et al. Immunopathogenesis of antisynthetase syndrome-associated ILD. Autoimmun Rev. 2017;16(10):1055–1064. DOI: 10.1016/j.autrev.2017.08.001
- Gono T, et al. Pathophysiology and cytokine dysregulation in anti-MDA5-positive ILD. Rheumatology (Oxford). 2020;59(5):1028–1038. DOI: 10.1093/rheumatology/kez386
- Fujimoto M, et al. Treatment and management of rapidly progressive MDA5-positive ILD: current perspectives. Ther Adv Musculoskelet Dis. 2021;13:1759720X21101974. DOI: 10.1177/1759720X21101974

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