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Screening of interstitial lung disorders with a multidisciplinary approach: A comprehensive analysis of the empirical results and future prospects

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ABSTRACT

Objective: A fundamental shift in the diagnostic strategy for diffuse lung illness was emphasized by the possibility of a Multidisciplinary Analysis (MDA) to identify interstitial pneumonia. This research offered a multidisciplinary screening method for interstitial lung disorders and a detailed analysis of current and past information.

Material and Methods: These guidelines also emphasize the necessity of excluding lung involvement associated with connective tissue diseases, which has clear clinical and therapeutic implications.

Result: The radiologist, pathologist, pulmonologist, rheumatologist and oncologists during lung cancer studies situations where pulmonary involvement could be the initial or most apparent sign of a systemic autoimmune illness to enhance diagnostic agreement and characterization. Interstitial Pneumonia including Autoimmune Features (IPAF) classification criteria aims to characterize lung participation specifically in unexplained autoimmune diseases. Due to the difficulty of autoimmune illness and the poor categorization standards regarding pathologies like anti-synthetase syndrome, rheumatologists must correctly interpret the autoimmune element and apply classification criteria to change the clinical images that were first perceived as IPAF in described autoimmune diseases, lowering the chance of a false positive.

Conclusion: Rheumatologists can play a key role in identifying CTD-ILD or IPAF in MDA meetings. Typically, the MDA includes a pulmonologist, pathologist, and radiologist, with a focus on efficient evaluation and screening. The MDA approach also might be useful in ILD-progressed lung cancer patients, where ILD patients have an increased risk of the development of lung cancer.

Keywords: interstitial lung disorders, multidisciplinary, Interstitial Pneumonia with Autoimmune Features (IPAF), anti-synthetase syndrome, rheumatologists, lung cancer

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INTRODUCTION

Internal Lung Disease (ILD) is a catch-all expression for a wide variety of conditions that scar the lungs. Scarring makes the lungs rigid, which makes it difficult to breathe and deliver oxygen to circulation. A corticosteroid is often used as the first line of treatment for many patients with interstitial lung disorders, sometimes in conjunction with other immune-suppressing medications. This mixture can sluggish or even maintain the course of interstitial lung disease based on its underlying cause. The most common kind of pulmonary fibrosis is the idiopathic kind of ILD, having a life expectancy of 3 years to 5 years. In a while, other, less dangerous varieties can endure much longer. Therapies could support preserving life expectancy for people with any form of ILD. The diagnosis and categorization of diseases are crucial for the growth of human health [1]. Various parenchymal lung diseases with varying clinical, serological, histological and radiological characteristics add to ILD. Therapy and prognosis are highly reliant on the ILD subgroup, it is essential to define ILD appropriately. An underpinning Connective Tissue Disease (CTD) must be checked on each case with ILD, despite suspicion being low or non-existent, since ILD could exacerbate the orientation of any CTD and because the indicators of CTD are usually difficult to diagnose [2]. Several illnesses with both known and unidentified sources fall under the umbrella term of acutely acting interstitial lung disorders. The development of widespread alveolar injury in the lung, which is often linked to a very poor prognosis and significant patient mortality, is a characteristic of such acute symptoms. Acute ILD emerge as an acute manifestation of a chronic ILD, present as the initial symptom of a chronic lung illness, become a quickly growing idiopathic or no idiopathic disease, or arise as the predisposition of one [3]. Interstitial pneumonia with autoimmune features has recently distinct by criteria that have permitted ILD that did not satisfy specific CTD requirements to be reclassified. This has sparked a rise in the investigation of such new categories, particularly their potential evolution into CTD and general diagnosis [4].

Research discussed the justification for an MDA for the early detection and evaluation of individuals, including SSc-ILD [5]. While early illness could be asymptomatic and SSc-ILD signs, while non-specific symptoms, such as fatigue, asthma and coughing, are common, identifying SSc-ILD could be challenging. As pulmonary function assessments fail specificity and sensitivity, particularly in early illness, the most effective method for

identifying SSc-ILD is lung calculated scanning. Study evaluated the consistency and evolution of trends in SARD screening between rheumatologists and pulmonologists and an increased MDT among rheumatologists [6]. They calculated the thickness among rheumatologist lonely and eMDT in the clear evidence of 70 potential SARD-ILD developments and the compassion among the pulmonologist and rheumatologist in discovering warning signs of SARDs in 81 ILD patients. The goal of was to exhibit preclinical characteristics and proceed slowly over time [7]. It may show acute signs and a fast, clinically relevant development that causes a severe decline in pulmonary function and respiratory failure. Indicators of poor outcomes and a higher death rate for SARDsILD include the ILD radiographic sequence, the illness severity, the starting pulmonary function level, the percentage of time at which lung function declines, and clinical characteristics of the initial SARD, like period, gender, and quote implies. Article demonstrated that an MDA may improve the diagnostic certainty for various ILDs and serve as a therapy decision-making tool for the clinical management of patients with ILD [8]. Based on its optimal placement in the diagnostic and therapeutic operation, the practicalities and difficulties of its usage, MDT talks' value for diagnosis, monitoring illness development and treatment choices will need to be considered. Study described a case of a 3-years-old man with ILD who was underweight and dependent on a nutritionally complete feed [9]. They used a comprehensive strategy to safely and efficiently manage ARFID. Paper provided a brief history of the adult and juvenile ILD categorization schemes [10]. Genetic testing and discovering new objects depend on dividing illnesses into measured using different categories. The aim of examined the most recent research on the pulmonary effects of medications in R. A. and ILD patients [11]. They also recommend a paradigm for treating RA-ILD patients and lay out a scientific plan to block the information holes regarding the problematic patient population. Research discussed the difficulties healthcare professionals can encounter when making an accurate intervention for fibrotic ILD [12]. They also looked at techniques to accurately diagnose fibrotic ILD in the universal residents and between those at hazard for the condition. They concluded by talking about the issues and significant concerns surrounding inflammatory ILD screening programs.

The primary purpose of this research is to conduct a comprehensive review of the relevant prior research to investigate the existing body of knowledge concerning the composition, function, and outcomes of Multidisciplinary Teams (MDTs) in the context of the diagnosis and treatment of Inflammatory Bowel Disease (ILD), as well as to assess the significance of the contributions made by rheumatologists.

The remainder of this study is planned as follows:

- Section 2 introduces the suggested technique.
- The research results are in Section 3.
- Section 4 contains the discussion.
- Section 5 contains the conclusion.

MATERIALS AND METHODS

This study utilizes targeted keywords to do a systematic study of PubMed and Embase (2018-2022). Studies using a multidisciplinary approach and ILD patients were included. Case reports, studies with less than 5 patients, and non-English studies were excluded.

Data

A systematic evaluation of the literature was conducted using the online databases PubMed (2018-2022) and Embase (2018-2022). The following keywords are used in the search strategy to find as many references as possible that dealt with the populations and interventions that were the subject of the study: "pneumonia," "interstitial, “lung disease, interstitial, “multidisciplinary," "interstitial pneumonia," "pulmonary fibrosis, “multidisciplinary approach," and “multidisciplinary team." After eliminating duplicate research, three reviewers individually read the headings and abstracts of each search result publication and chose the study that will be analyzed in this review.

Inclusion criteria

The inclusion criteria were used to choose the report:

- Population: individuals older than 18 having an ILD diagnosis that is either suspected or confirmed.
- Intervention: a multidisciplinary strategy including at least 2 doctors from separate disciplines
- The various study methods include case-control studies, cohort studies, studies with Randomized Control (RCTs), and case studies (over 5 patients) in English.
- Several languages and research types (case reports, narrative reviews, and abstracts from meetings) were omitted. Whenever there was a difference of opinion among the reviewers, a 3rd author was contacted to make a decision.

The definition of the MDT organization and participating doctors, paying special attention to the clinical information gathered and the instrumental examinations conducted, was the direct result of this systematic review. Reviewers individually evaluated the selected papers, including all information recovered through an extraction form created to address the main and second examination goals. Researchers, date of publication, journal, research methodology, inclusion and exclusion requirements, participation quantity, and region (IPF, ILD associated with CTD, newly diagnosed ILD, or both), interventions (involving doctors, consideration of technical exams even during MDD), and all assessed results were retrieved (Diagnosis, prognosis, therapy effectiveness, and many other).

Exclusion criteria

The following research types are not included:

- Conference abstracts, narrative reviews, and case reports.
- Studies not conducted in English.
- Articles those have less than 5 patients.
- Research where a minimum of two medical professionals from distinct specializations did not employ a multidisciplinary methodology.

RESULTS ANALYSIS

The search resulted in 33 PubMed citations and 95 Embase citations. After removing duplicates, we evaluated the titles and abstracts of 95 references before selecting 23 to read in their

entirety. 9 sources were ultimately taken into account for data extraction. The number of approved articles and the grounds for rejection are displayed in figure 1.

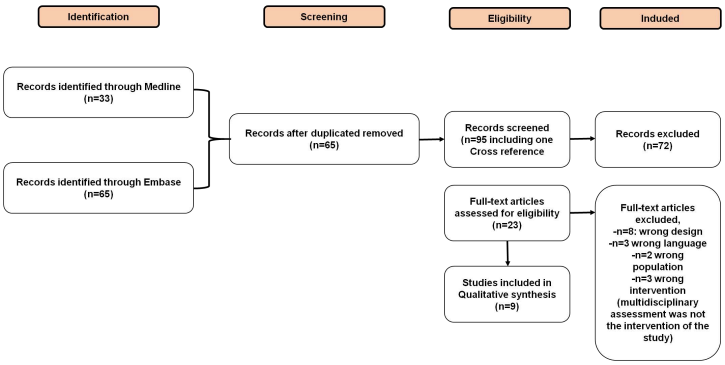

Fig. 1. Flow of literature exploration

Cooperating pathologist in the MDT

Pathologists are essential in the diagnosis and treatment of difficult medical disorders in Multidisciplinary Teams (MDTs), especially when dealing with uncommon or complex diseases. Their main duty is to offer thorough histopathological evaluations, which are necessary for precise diagnosis and therapy planning. A pathologist who works closely with other experts makes sure that all diagnostic data is taken into account in relation to the patient's general health or clinical presentation [13]. The pathologist's roles encompass the interpretation of biopsy and surgery specimens, the identification of disease indicators, and the provision of prognostic insights. Their knowledge is essential for validating diagnoses that inform treatment approaches and patient care plans, assisting the MDT in making decisions. To provide more precise and prompt diagnoses, the pathologist also assists in improving diagnostic criteria and methods within the MDT [14]. Improved patient outcomes, better care coordination, and complete management of all disease-related elements are all facilitated by the pathology along with other team members having effective communication. In managing difficult situations, when integrated knowledge and experience from multiple disciplines are required to obtain the best possible results, this cooperative strategy is particularly advantageous [15]. The medical professionals most often participating in MDT in the included studies were pulmonologists, thoracic radiologists and thoracic pathologists. 3 papers provided descriptions of the rheumatologist position. Three studies also included information on additional professionals, such as clinical nurse specialists, lung transplant teams, cardiothoracic surgeons, occupational therapists, immunologists, palliative care specialists, respiratory therapists, physiotherapists and dietitians. Many studies compared various MDT compositions. Lok contrasted a normal respiratory clinic with only a neurologist and a pharmacist to an ILD clinic with a doctor specializing in ILD, with the aid of radiology, pathology and connection to transplantation and cardiothoracic programs.

Given that age is one of this group's most significant unfavorable prognostic variables, a multidisciplinary approach-based follow-up benefits patients older than 60 years of survival. The MDT trial included a clinical nurse specialist in addition to the traditional group of clinicians, histopathologists and radiologists. In comparison to histology, the Authors stressed the relevance of MDD in establishing an analysis of ILD. Since genetic investigations were rarely done throughout the standard MDD for ILD, this investigation focused on inherited forms of pulmonary fibrosis. BAL, Doppler echocardiography and the 6-minute walking test were among the supplementary instrumental assessments recorded during MDD in 15 trials (Table 1).

Tab. 1. Factors considered in the diagnosis of MDD

Medical Estimation	PFT	HRCT	Other	Lung Biopsy	Laboratory Test
Pharmacologic use of the Complex Refractive Index	DLCO and FVC	Nil	Nil	Nil	No
Anatomy	FVC, DLCO, FVC or FEV1	at in baseline	BAL, PaO_2	Confirmed	No
Anatomy and physi-ology	Yes, DLCO, FEV1 and FVC	Yes, within 3 months from SLB	Bronchoscopy using 6-MWT and bronchoalveolar lavage	Confirmed	SpO_2, or arterial blood gas analysis, and the findings of blood tests
Anatomy	Yes, not specified	Confirmed at baseline	-	Confirmed	No
Anatomy	FVC, FVC or FEV1 and DLCO	Confirmed at baseline	-	No	No

Comparison of Cigarette Habits Index	Confirmed, every three to six months for FVC, FEV1, DLCO, and DLCO/VA.	Confirmed, every 3–6 months	Echocardiography	Confirmed	Connective tissue disease-related auto-antibodies, Krebs von der Lungen-6, surfactant protein D, and antinuclear antibody
Anatomy and Physiology	not specified	Confirmed at baseline	BAL	Confirmed	Serological data (not specified)
Anatomy, exposure anatomy	Confirmed, almost ready for a biopsy FEV1, TLC, DLCO, and FVC	Closed to biopsies, indeed. classified as either a confirmed UIP, a potential UIP, or not consistent with the UIP pattern	Telomere length measurement and MUC5B genotyping	Confirmed	No
Anatomy and physiology	not specified	Confirmed at baseline	BAL	Confirmed	Serological data (not specified)

Rheumatologist's functions

Rheumatologists specialize in the diagnosis and treatment of a broad spectrum of inflammatory and autoimmune illnesses, which mostly affect the connective tissues, muscles, and joints. Their knowledge is essential for treating long-term illnesses including osteoarthritis, lupus, and rheumatoid arthritis. To determine precise diagnoses and customize treatment regimens, they carry out thorough assessments that include medical exams and diagnostic testing [16]. Rheumatologists distinguish between various rheumatic disorders using a range of diagnostic techniques. These include imaging techniques such as MRIs or X-rays to evaluate joint damage, synovial fluid examination from joint aspirations, and blood tests to identify markers of inflammatory or autoimmune. To avoid the course of the disease and to design appropriate care measures, an accurate diagnosis is crucial [17]. Rheumatologists create and supervise treatment regimens that frequently involve prescription drugs, rehabilitation, and lifestyle changes when a diagnosis is made. To treat symptoms and halt the advancement of the illness, they prescribe biologics, Disease-Modifying Antirheumatic Medicines (DMARDs), and other treatments. One of the main duties is to monitor and modify treatment plans in accordance to the patient's reaction and the state of the disease [18]. Informing patients about their illnesses, available treatments, and self-management techniques is a critical role that rheumatologists perform. They provide advice on modifying one's food and way of living to enhance one's general well-being. In order to assist patients, manage the emotional and practical difficulties associated with chronic rheumatic illnesses, supportive care also addresses the psychological effects of these conditions [19]. Rheumatologists frequently work in conjunction with primary care doctors, orthopedic surgeons, and physical therapists to manage complicated rheumatic disorders. By addressing all facets of the patient's health and improving treatment outcomes, this interdisciplinary approach guarantees complete care [20]. Just a third of those affected reported muscle complaints. According to the authors, the rheumatological examinations have prevented 8 bronchoscopies and 2 lung biopsies.

As a result of these considerations, the study has devised a suggestion for the MDT's structure that gives a variety of possibilities for proposing the rheumatologist's involvement in MDD, especially in the recognition of IPAF and CTD-ILD. ILD patients have an HRCT pattern that is more characteristic of IPF and less common in ILD linked with autoimmune disorders. Although less common, a UIP pattern is still discovered in dealing with rheumatological conditions like R. A. or SSc. In light of this study proposed that the MDT pulmonologist be qualified to recognize the clinical signs of CTD, as shown in table 2.

Tab. 2. MDT pulmonologists be trained to distinguish the clinical signs of CTD

Inflammatory Condition Clinical Manifestations	Characterization
Swollen or bony fingertips	Hands that have swelled or become thick
Telangiectasia	Hand and facial veins are examples of dilated blood arteries with a diameter of 0.5 ml to 1 ml close to the skin's surface
Diabetic foot ulcer	Destruction of the epidermal, elastin, subcutis, and even bone may result from this condition
Raynaud syndrome	A vascular condition that causes fingers and toes to become progressively paler, cyan, and red when exposed to cold
Joint effort	Phalanges joint, first metacarpophalangeal joints, and first metatarsal joints are not evaluated, but any swollen or sore joint is. Imaging would confirm synovitis

Inventor's hands	Palmar regions of the fingers that are hard, brittle, hyperkeratotic, and have skin fissures
Sicca syndrome	Daily and continuing dryness of the lips and eyes for at least 3 months
Gottron signs	Muscles surface rashes that don't go away
Eliotrophic rash	Eyelid edema, as well as telangiectasia, are common complications of violaceous erythema of the top eyelids
Gottron papules	Muscle surfaces of the proximal interphalangeal and related interpretations joints are covered with erythematous to violaceous papules and plaque
Expressive aphasia	Problems swallowing
Sickness	Inexplicable in light of other considerations
Fragility of muscle	Anterior upper and lower limbs are weak because distal tissues are less active. Neck flexor stiffness can frequently be more significant than neck extender stiffness

Figure 2 shows IPAF patients. A newly discovered autoimmune condition, IPAF characteristics, is defined by the attendance of interstitial lung disease and the presence of autoantibodies lacking a particular connective tissue disease diagnosis or alternative explanation. The thoracic surgeons at ILD use IPAF for many surgeries each year. ILD's staff is equipped to treat individuals of any age who suffer from CTD. The number of articles published by IPAF in 2022 is higher than in previous years.

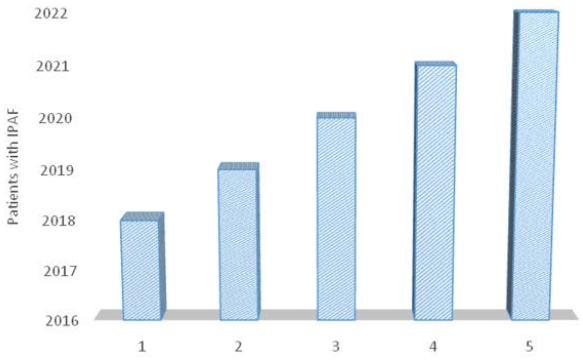

Fig. 2. Patients with IPAF

The Cost Rate is the fraction that results from dividing the entire amount of benefits paid out in a given calendar year by the total amount of wages paid out in that year is represented in figure 3. The percentage of total direct expenses attributable to IPAF was 18.9%. The 2 most significant contributors to the direct expenditures of all causes were hospitalization and Medicine. Hospitalizations accounted for 34.8% of the direct expenses associated with IPAF, whereas antifibrotic treatment accounted for 49.4%. The cost of drugs for treating fibrosis was 32.1% of the total.

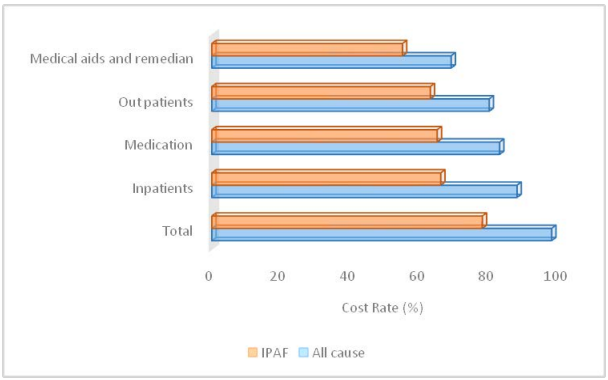

Fig. 3. Cost rate

Figure 4 shows the overall survival rate. Survival rates for certain diseases are calculated by collecting information on all individuals diagnosed. The survival rates of different periods can be utilized to make generalizations about those eras. Nevertheless, illness survival rates are frequently presented as relative rates over 3-years. The diameter-related disparities in 1-year unadjusted independence from effects in almost every mortality component remained.

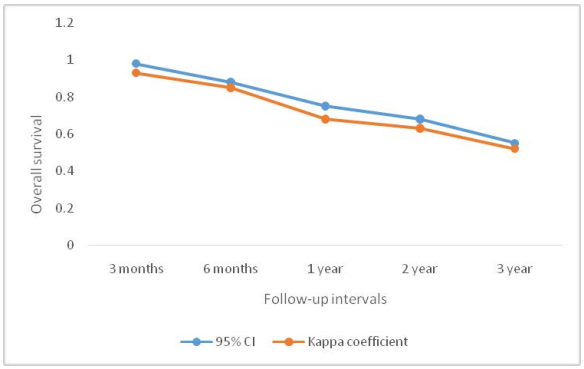

Fig. 4. Overall survival

DISCUSSION

At a less intrusive level than lung biopsy, HRCT is presently a popular diagnostic method in evaluating ILD patients. Diagnostic accuracy and interrater reliability agreement between radiologists were greater among pathologists. Besides that, distinct histological abnormalities could occur in various patient regions. According to recent treatment guidelines, a traditional UIP model with HRCT can be measured as a significant standard for determining the analysis among people suspected of IPF [21]. The MDA is crucial in this patient population, particularly for identifying IPF, the type of ILD with the poorest outlook and estimated median survival of up to three years after diagnosis. A proper and timely diagnosis of IPF is essential, considering the current availability of potential anti-medications like nintedanib and pirfenidone. SLB is often considered when scanning conflicts with UIP and when there are discrepancies in medical studies [22]. Patients without a clear UIP signal during HRCT need a comprehensive examination. Studies from various fields have shown a varying probability of IPF ranging between 90% to 60%, particularly for the likely UIP structure. MDA typically includes a pathologist, radiologist and pulmonologist with expertise in ILD, but additional medical pro-fessionals, such as rheumatologists, thoracic surgeons, lung trans-plant surgeons, and allied health experts, are sometimes called upon as needed. Despite the guidelines and existing research, it is unknown if the multimodal team is superior to a solitary inde-pendent expert using medical judgment to make patient diagno-ses with ILD [23]. Furthermore, it is not always possible to apply the IPF principles strictly; for example, doing SLB is not always viable because of security issues, and the agreement between the observers when defining the UIP design is often only modest. This research demonstrated that only a small number of patients would be sent to SLB in the event of a preliminary strong confidence IPF diagnosis. However, in 63% points of individuals with an analyti-cal probability of 70% points and in 41.5% and 63% of beginning strong assurance and dejection IPF diagnosis, most doctors ad-ministered antifibrotic medication without undertaking the histo-logical assessment. The recommendations underline the necessity to rule out a CTD while evaluating a patient with ILD. Accord-ingly, a rheumatologist may be essential for recognizing particular non-pulmonary clinical presentations that conventional MDA participants may not readily recognize, especially for individuals with characteristics that are not accurate with IPF regarding demographics, clinical signs and histopathology. IPF and CTD-ILD have identical histological UIP patterns; however, CTD-ILD is more often characterized by less extensive honeycombing and also more pronounced lymphoid hyperplasia with progenitor cells [24].The diagnostic strategy, treatment and record are well described, and the rheumatologist is instinctively attentive to patient care since ILD could be a symptom that develops through an existing CTD. In some situations, ILD can be the initial sign of an undiagnosed CTD, while the remaining usual clinical symptoms could not arise until the pulmonary inclusion. The proper diagnosis for both these individuals is more challenging because of the absence of defined categorization parameters and a skilled rheumatologist is required to assess such patients. The rheumatologist is essential in these pathological circumstances to notice the subtler and less obvious indicators and symptoms that cannot be identified through other professionals typically participating in the MDA. Blood tests, especially those that look for inflammation, are essential for evaluating patients having ILD and several recommendations have suggested doing various biochemical testing [25]. In recent years, it has been feasible to categorize sufferers with uncertain clinical diagnoses, particularly when there is evidence of negative ANA or cytoplasmic patterns, to the dissemination of scientific kits that can detect and relate myositis antibodies. For up to 10% to 30% of patients with myositis spectrum disorder, the earliest clinical appearance is myositis to predominant pulmonary presentation, which antibodies like MDA-5 and particular anti-synthetase antibodies like PL2 and PL7 detect. IPAF, a clinical category that has just recently been characterized and for whom categories have been developed, represents another diagnostic hurdle. When serological and clinical abnormalities characteristic of CTD are observed but not enough to assemble the criteria for a specific immune disorder, IPAF can be regarded as an ILD. These categorization parameters allow for identifying a wide range of clinical categories as IPAF, involving individuals with rather premature SSc or additional CTDs, several myositis spectrum conditions that first manifest mostly as lung conditions. It can lead to incorrectly classifying patients, particularly without a rheumatologic assessment. Considering these factors, there are no concrete indicators of the rheumatologist's participation in MDT [26]. A rheumatologic examination following MDA was just mentioned in 7/29 of the research analyzed in this analysis, focusing on the right categorization of individuals originally diagnosed with IPF and the prospect of preventing future diagnostic procedures. It is not feasible to draw a clear conclusion on the methods and timeline of the rheumatologist's participation in this situation again from currently available research.

CONCLUSION

While their specific function in this respect is unknown, rheumatologists in MDD play a significant role in determining whether or not a patient has CTD-ILD or IPAF. According to the results review, the typical members of the MDA are the pulmonologist,

the pathologist, and the radiologist. The former is a crucial component of the MDA and can be educated to identify IPAF and CTD-ILD to decide on individuals for rheumatological examination. This approach can potentially make MDA meetings more effective by lowering the number of experts that need to be present. Additional tests are only performed when there is a rheumatological justification. They are individualized based on the patient's level of suspicion by the MDA framework that has been suggested. This framework also includes a small group of standard blood tests used for screening.

ILD patients who need prompt diagnosis and treatment and are more prone to lung cancer is a challenging task. These patients are at increased risk for adverse effects from all modalities of lung cancer treatment. Thus, ILD and lung cancer have a close association that needs the care of the patients, where the MDA framework, elucidated in the present study, might prolong the survivability as a future prospect.

REFERENCES

1. Wong AW, Fidler L, Marcoux V, Johannson KA, Assayag D, et al. Practical considerations for diagnosing and treating fibrotic interstitial lung disease during the coronavirus disease 2019 pandemic. Chest. 2020;158:1069-1078.
2. Tirelli C, Morandi V, Valentini A, La Carrubba C, Dore R, et al. Multidisciplinary approach in the early detection of undiagnosed connective tissue diseases in patients with interstitial lung disease: a retrospective cohort study. Front Med (Lausanne). 2020;7:11.
3. George PM, Spagnolo P, Kreuter M, Altinisik G, Bonifazi M, et al. Progressive fibrosing interstitial lung disease: clinical uncertainties, consensus recommendations, and research priorities. Lancet Respir Med. 2020;8:925-934.
4. Furini F, Carnevale A, Casoni GL, Guerrini G, Cavagna L, et al. The role of the multidisciplinary evaluation of interstitial lung diseases: a systematic literature review of the current evidence and future perspectives. Front Med (Lausanne). 2019;6:246.
5. Chatterjee S, Perales A, Yadav R, Kirby DF, Singh A. A multidisciplinary approach to the assessment of patients with systemic sclerosis-associated interstitial lung disease. Clin Rheumatol. 2022;41:1-9.
6. De Lorenzis E, Bosello SL, Varone F, Sgalla G, Calandriello L, et al. Multidisciplinary evaluation of interstitial lung diseases: new opportunities linked to rheumatologist involvement. Diagnostics (Basel). 2020;10:664.
7. Panagopoulos P, Goules A, Hoffmann-Vold AM, Matteson EL, Tzioufas A. Natural history and screening of interstitial lung disease in systemic autoimmune rheumatic disorders. Ther Adv Musculoskelet Dis. 2021;13:1759720X211037519.
8. Cottin V, Martinez FJ, Smith V, Walsh SL. Multidisciplinary teams in the clinical care of fibrotic interstitial lung disease: current perspectives. Eur Respir Rev. 2022;31:210164.
9. Stubbs KH, McMahon MX, Popler J, Berry RC, Sharp WG. Multidisciplinary feeding treatment for a patient with interstitial lung disease. Pediatr Pulmonol. 2022;57:3183-185.
10. Griese M. Etiologic classification of diffuse parenchymal (interstitial) lung diseases. J Clin Med. 2022;11:1747.
11. Cassone G, Manfredi A, Vacchi C, Luppi F, Coppi F, et al. Treatment of rheumatoid arthritis-associated interstitial lung disease: lights and shadows. J Clin Med. 2020;9:1082.
12. Spagnolo P, Ryerson CJ, Putman R, Oldham J, Salisbury M, et al. Early diagnosis of fibrotic interstitial lung disease: challenges and opportunities. Lancet Respir Med. 2021;9:1065-1076.
13. Browning L, Fryer E, Roskell D, White K, Colling R, et al. Role of digital pathology in diagnostic histopathology in the response to COVID-19: results from a survey of experience in a UK tertiary referral hospital. J Clin Pathol. 2021;74:129-132.
14. Taberna M, Gil Moncayo F, Jané-Salas E, Antonio M, Arribas L, et al. The multidisciplinary team (MDT) approach and quality of care. Front Oncol. 2020;10:85.
15. Scott B. Multidisciplinary team approach in cancer care: a review of the latest advancements. Oncology. 2021;99:2-13.
16. Solomon DH, Rudin RS. Digital health technologies: opportunities and challenges in rheumatology. Nat Rev Rheumatol. 2020;16:525-535.
17. Chang LS, Huang PY, Kuo HC, Tu YK, Tseng PT, et al. Diagnostic accuracy of the American College of Rheumatology-1997, the Systemic Lupus International Collaborating Clinics-2012, and the European League Against Rheumatism-2019 criteria for juvenile systemic lupus erythematosus: A systematic review and network meta-analysis. Autoimmun Rev. 2022;21:103144.
18. Fiehn C, Ness T, Weseloh C, Specker C, Hadjiski D, et al. Safety management in treatment with antimalarials in rheumatology. Interdisciplinary recommendations on the basis of a systematic literature review. Z Rheumatol. 2021;80:123-130.
19. Ahmed S, Zimba O, Gasparyan AY. Moving towards online rheumatology education in the era of COVID-19. Clin Rheumatol. 2020;39:3215-3222.
20. Najm A, Kostine M, Pauling JD, Ferreira AC, Stevens K, et al. Multidisciplinary collaboration among young specialists: results of an international survey by the emerging EULAR network and other young organisations. RMD Open. 2020;6:001398.
21. Jeong SO, Uh ST, Park S, Kim HS. Effects of patient satisfaction and confidence on the success of treatment of combined rheumatic disease and interstitial lung disease in a multidisciplinary outpatient clinic. Int J Rheum Dis. 2018;21:1600-1608.
22. Han Q, Wang HY, Zhang XX, Wu LL, Wang LL, et al. The role of follow-up evaluation in the diagnostic algorithm of idiopathic interstitial pneumonia: a retrospective study. Sci Rep. 2019;9:6452.
23. Eisenstadt J. Beyond Idiopathic pulmonary fibrosis diagnosis: multidisciplinary care with an early integrated palliative approach is associated with a decrease in acute care utilization and hospital deaths. J Pain Symptom Manage. 2018;55:420-426.
24. Tanizawa K, Ley B, Vittinghoff E, Elicker BM, Henry TS, et al. Significance of bronchiolocentric fibrosis in patients with histopathological usual interstitial pneumonia. Histopathology. 2019;74:1088-1097.
25. Kondoh Y, Taniguchi H, Kataoka K, Furukawa T, Shintani A, et al. Clinical spectrum and prognostic factors of possible UIP pattern on high-resolution CT in patients who underwent surgical lung biopsy. PLoS One. 2018;13:0193608.
26. Han Q, Wang HY, Zhang XX, Wu LL, Wang LL, et al. The role of follow-up evaluation in the diagnostic algorithm of idiopathic interstitial pneumonia: a retrospective study. Sci Rep. 2019;9:6452.