

AUTHORS' LIST**IDIOPATHIC PULMONARY FIBROSIS COMMENTARY****1- Dr. George Nyale**

Kenyatta National & Referral Hospital, Kenya
Respiratory Society of Kenya
Email: gnyale2003@yahoo.com

2- Dr. Stefanni Paraguas

Philippine Heart Center, Philippine
Email: stefanni_md@yahoo.com

3- Dr. Shereen Khan

Fatima Institute of Chest Diseases, Quetta, Pakistan
Email: shereenqta@yahoo.com

4- Dr. Syed Munis Ul Hasan

Dow University of Health Sciences, Pakistan
Email: dr.monis-ul-hasan@live.com

5- Dr. Jahanzeb Kamal Khan

College of Physicians & Surgeons of Pakistan, Pakistan
Email: jahanzebkk@yahoo.com

6- Dr. Maqbool Ahmed

Fatima Jinnah institute of chest diseases Quetta, Pakistan
Email: dr.maqboollangove@gmail.com

7- Dr. Dhamith Nandadeva

District General Hospital Monaragala and Chest Clinic Monaragala, Sri Lanka
Email: d.nandadeva@gmail.com

8- Dr. Andrew Owuor

Kenyatta University, Teaching and Referral Hospital, Kenya
Email: otis2ke@yahoo.com

9- Dr. Sumedha Heenagamage

District General Hospital, Sri Lanka
Email: drsumed@yahoo.com

MESSAGES

Dr. George Nyale

Idiopathic pulmonary Fibrosis is a rare lung disease of uncertain origin but which causes progressive decline in lung function resulting in worsening shortness of breath. Its incidence has been increasing worldwide though the prevalence remains low. The diagnosis of this disease is first usually suggested after a high resolution chest CT scan to evaluate the lung. Good quality chest imaging has reduced the need to get lung tissue for diagnosis. Doctors' continuous medical education has improved doctors' awareness and knowledge of this disease



Most patients get to pulmonologists or centre that can handle the diseases late when the lung function has severely deteriorated and trail of any advanced therapies has limited impact. The development of good and early referral systems would be very helpful to patients with this disease. Also patient care pathways need to be developed with a local input to guide care and facilitate supportive treatment including providing home oxygen. It is also important for each country to set up local disease registries than collect data on patients with this disease and facilitate research with a view of developing a cure for this relentless pulmonary disease.

I thank Getz Pharma for arranging the IRF series and developing these commentaries of the consensus developed during IRF 2022 via polls that have tried to address the yawning gaps and challenges in the care and treatment of IPF specifically in many middle and low income countries.

MESSAGES

Dr. Stefanni Nonna M. Paraguas

Indeed, the diagnosis of Idiopathic pulmonary fibrosis (IPF) is challenging and is based on a complete and thorough history, clinical symptomatology and diagnostic workups.

It's hoped that the figures discussed regarding the disease will be improved by the availability of new treatments to slow the disease's progression.

I believe the success of this initiative is not dependent on just one group but rather on considering the different stakeholders. In the Philippines, we have started our registry for IPF patients and raised awareness through lectures initiated by medical professional societies such as the Philippine College of Chest Physicians. We have shared discussions with pharmaceutical industries to help with the availability of treatment for diagnosed patients.



It is essential to monitor diagnosed patients proactively to identify disease progression, worsening symptoms, and oxygenation to detect, and appropriately manage co-morbidities/complications. We need to optimize strategies for addressing quality of life, including treatment of comorbidities, physical activity, emotional well-being, and palliation of symptoms.

Lastly, I believe it is also important and our responsibility to raise awareness about IPF among patients, healthcare professionals (HCPs) and the general public.

Thank you to Getz Pharma for the opportunity where we have been able to raise awareness regarding the burning issues related to IPF and its management. These publications of the consensus developed during IRF 2022 would help us communicate the common challenges faced by all the stakeholders of IPF disease management especially in the low-middle-income countries.

MESSAGES

Dr. Shereen Khan

Idiopathic Pulmonary Fibrosis (IPF) is a rising respiratory problem both in underdeveloped and developed countries however it poses additional problems in underdeveloped (low and middle-income) countries in terms of management, cost and further research. Despite so much advancement in medicine and drug development, the world is still awaiting some disease-modifying or disease-limiting drugs for the optimum management of IPF. Lack of public awareness regarding the disease, its management and the associated misconceptions further worsens the scenario.



Getz Pharmaceutical is doing a tremendous job by arranging the "International Respiratory Forum IRF" in order to educate physicians and also to share the experiences between experts from different countries. During IRF 2022, the IPF Symposium held at Ho Chi Minh City was an excellent effort to educate healthcare professionals and to conduct a survey to evaluate the perceptions and challenges associated with the appropriate management of IPF. Identification of such factors will surely lead to steps for the solution of the problems and by publishing the consensus, we can extend this information to a larger pool of healthcare professionals.

I am thankful to Getz Pharma for giving me the opportunity to be part of this great activity and wish the team lot of success in future endeavors.

Challenges in Idiopathic Pulmonary Fibrosis Management

Abstract

Objective: The authors aim to evaluate the challenges faced by each stakeholder for Idiopathic pulmonary fibrosis (IPF) management, including the patients, their families/caretakers, Healthcare professionals, and Healthcare policymakers and organizations in Low-middle income countries (LMICs) as perceived by 140 pulmonologists from 11 countries who participated in International Respiratory Forum conference 2022 in Ho Chi Minh City, Vietnam.

Methodology: A predesigned structured questionnaire was developed about challenges faced by each stakeholder for IPF management. Study participants were randomly divided into four groups, and only one section of the questionnaire was distributed among the participants of each group.

Results: It was observed that the physicians greatly supported the psychological well-being of the patients/caregivers and awareness among Healthcare professionals (HCPs) for timely referrals and diagnosis. The caregivers must support the patients to keep their willpower intact. The availability of only those therapies with modest treatment outcomes with no benefits in halting the disease or reducing mortality and the absence of disease-modifying drugs was considered the major challenge faced by Pulmonologists. Patient affordability was considered the key hindering factor affecting High-Resolution Computed Tomography (HRCT) utilization. The development of Interstitial lung disease (ILD) national registries to keep track of disease prevalence and challenges at hand was defined as the urgent healthcare initiatives that need to be taken by the concerned healthcare policymaking authorities. Moreover, the healthcare systems considered comprehensive patient education about disease management and outcomes the most effective self-management strategy to be incorporated and disseminated. Although a small number of patients with ILDs, specifically IPF, receive a prompt and accurate diagnosis, the survey found that protracted delays, frequent misdiagnoses, exposure to expensive and invasive diagnostic procedures, and significant use of healthcare resources mark the more typical diagnostic experience for those with ILD.

Conclusion: These findings indicate the requirement for novel diagnostic tools, best clinical practices, and HCPs training to improve the accuracy of diagnoses in ILD patients.

Keywords: Idiopathic Pulmonary Fibrosis, Management, Challenges.

Introduction

Idiopathic pulmonary fibrosis (IPF) is a progressive interstitial pneumonia with fibrosing that has no known etiology. It only affects the lungs and is linked to specific (evidence of patchy lung parenchyma involvement) changes¹. The disease has a poor prognosis, with a median survival time of 2 to 3 years from the time of diagnosis in retrospective longitudinal investigations. IPF can be difficult to diagnose in daily practice, and there is frequently a long lag between the disease's initial symptoms, typically a combination of Dry cough and dyspnea with exertion: the definitive diagnosis. Furthermore, a sizable fraction of cases do not achieve a sufficient diagnostic confidence level on the radiologic investigation, necessitating invasive lung biopsy procedures. Disease management is also difficult² and frustrating to patients, caregivers, and doctors.

It is suggested that early patient referral to facilities with specialized knowledge and prompt diagnosis could result in more effective disease care³. Patients would benefit from early diagnosis regarding adequate illness information, prompt referral for lung transplantation, avoidance of inappropriate medications (such as steroids and immunosuppressive drugs), and enrollment in clinical trials^{3,4}. However, Early IPF symptoms are frequently modest, and ILD screening efforts are restricted to people with recognized risk factors or a family history of IPF⁵.

The challenge is to lessen the uncertainty of the diagnosis. Experts have suggested that early referral to a specialty centre can be beneficial in cases where IPF is recognized or suspected, like unexplained dyspnoea⁶. The diagnosis of IPF necessitates close-fitting coordination between clinicians, radiologists, and pathologists skilled in ILD; this is especially important when the radiologic and histopathologic patterns are at odds. It has been revealed in many surveys that only dedicated centers with high-volume ILD programmes can offer multidisciplinary specialist clinics and coordinated services⁷. Participation in a clinical trial may also be made possible through referral to facilities with competence.

IPF management has numerous difficulties; current recommendations support lung transplantation and enrollment in a clinical study as treatment alternatives⁸. The number of medicines being tested for IPF has dramatically increased over the last ten years due to an improved understanding of the pathobiology of the disease⁹. Although there are risks associated with clinical trial participation, particularly those related to the drug being tested, this choice gives patients a chance to take an active role in their healthcare, access novel, possibly helpful treatments, and receive professional medical care at the best hospitals.

One specific challenge is several unmet medical requirements for caregivers of pulmonary fibrosis patients, including disease information, symptom management, financial aid, access to specialty facilities, advanced care planning, and psychological support. Comprehensive support adapted as the condition progresses the load on the caregiver¹⁰.

The overall purpose of this survey was to address the unmet need for information, challenges to make assured diagnosis desired by healthcare professionals who assess and treat people with IPF, to explore social support systems for patients and the people who care for them in this progressive disease and what their lives will be like as it progresses relentlessly. And finally, to share suggestions that policymakers in low-income countries can adopt in the face of this rising challenge.

Methodology

A survey was conducted during the International Respiratory Forum conference 2022 in Ho Chi Minh City, Vietnam. A total of 140 pulmonologists from 11 countries participated in the study. A predesigned structured questionnaire was developed pertaining to challenges faced by each stakeholder for IPF management, including the patients, their family/caretakers, Healthcare professionals, and Healthcare policymakers and organizations.

Verbal consent was obtained, study participants were randomly divided into four groups, and only one section of the questionnaire was distributed among the participants of each group. The questions and their options in each questionnaire addressed the documented key challenges of disease management and their possible solutions relevant to the assigned stakeholder group. The participants of each group were supposed to vote on the most relevant options as per their clinical experience.

For statistical treatment, the data analysis was conducted using SPSS Version 22.0. The quantitative data were presented as frequencies and percentages. SLIDO software¹¹ was used to present the survey results at the end of the conference.

Results

As perceived by the enrolled healthcare providers, among the dilemmas an IPF patient faces, the major one is the progressive and rapid increase in symptoms like shortness of breath, cough, and fatigue reported by 63% of physicians (Table 1). The second group responding with respect to family and caretakers reported that the caregivers must provide psychological support to keep the patient's willpower intact so they do not disregard self-care. Of the major challenges faced by Pulmonologists today related to ILD is the availability of therapies having modest treatment outcomes with no benefits in halting the disease or reducing mortality and the absence of disease-modifying drugs. Patient affordability was considered the key hindering factor affecting HRCT utilization. The development of ILD national registries to keep track of disease prevalence and challenges at hand was defined as the urgent healthcare initiatives that need to be taken by the concerned healthcare policymaking authorities, as per the opinion of 74% of physicians. Among the effective self-management strategies to be incorporated and disseminated by the healthcare systems, comprehensive patient education was considered as the foundation.

Discussion

Building on the progress in understanding IPF pathobiology, additional research into the function of gene variants, epigenetic changes, and other molecular biomarkers reflecting disease activity and behaviour should support the development of novel agents for personalized treatment of IPF and enable earlier and more certain diagnoses^{12,13}. The survey indicated that recommendations that deal with the diagnosis and management of IPF need to be revised in light of the changing understanding regarding the use of HRCT and other techniques. It was also observed that managing patients with IPF is still challenging without efficient pharmaceutical therapy. Updated guidelines and research will need to urge clinicians to refer patients with IPF for clinical studies and include a thorough analysis of the pharmacologic treatments for IPF that are currently on the market.

This study's findings can be considered when creating instructional materials for providers, patients, and

Table 1: Responses obtained from the healthcare providers for challenges in IPF management.

Questions	Responses	%
Patients		
What are the biggest dilemmas a patient of IPF has to face?	Progressive and rapid increase in symptoms like shortness of breath, cough, and fatigue	63
	Definitive treatment is not available; patients usually go on palliative care only	44
	Rapid occurrence of disabilities and poor quality of life	19
	Unable to anticipate the poor prognosis	6
What are the most troubling thoughts that come to an IPF patient's mind when the diagnosis is made, and the disease is explained?	Being dependent and a burden on the family caregivers	44
	Terminal illness leading to early death	38
	Disabilities to perform daily activities, including work	50
	Financial burden due to treatment and other healthcare costs	44
Among the symptoms, chronic breathlessness is the major challenge experienced by IPF patients. Which other most common adversity is linked with it?	Distress due to constant dry cough	38
	Restrictions of daily activities	75
	Diminished hunger	0
	Lack of sleep	6
What measures shall IPF patients take to reduce their dependency on family and caretakers?	Maintain a strong diet to have less effect on the disease	0
	Follow good breathing exercises regularly as a part of pulmonary rehabilitation	38
	Follow up with the primary physician regularly to keep the disease progress in check	31
	Discuss the possible adversities and complications of the disease with the physician, learn self-management strategies and then prepare to deal with them in anticipation	63
Family & Caretakers		
What should be the active role of family and caregivers of IPF patients?	Be actively involved and aware of the treatment options available	42
	Are well-acquainted and encourage patients to follow the self-management strategies	17
	Ensure appropriate diet and pulmonary rehabilitation to avoid or reduce severe symptoms	25
	Support the patient psychologically to keep their willpower intact so that they do not disregard self-care	75
What are the challenges faced by the caretakers of IPF patients to maintain their quality of life?	Work-life balance due to progressively deteriorating health conditions of the patients	50
	Financial constraints and limited accessibility to novel medications	50
	Psychological stress due to the short life expectancy of their patient	58
	Staying disciplined and compliant with the advised treatment and care	8
What are the most important instructions and information to be provided to the caretakers by the treating physicians of their IPF patients?	Limitations of the treatment options available, along with their duration and cost	33
	Symptomatic self-management strategies to reduce the impact of symptoms on the daily life of the patients and their caretakers	33
	Poor prognosis and short survival rates of the disease, especially when the diagnosis is delayed	25
	Importance of good nutritional and psychological support should be emphasized	50
What can be the useful parameters for the caretakers to assess the disease progression so that timely communication with the treating physician could be done for better treatment prognosis?	Frequency of severe breathlessness episodes	67
	Effect of antitussives on the constant cough	0
	Reduction in weight and dietary habits	25
	Any bluish discoloration or paleness of fingers, toes, or around the mouth	50
Healthcare Professionals		
What are the major challenges faced by Pulmonologists today related to ILD?	Less specificity and sensitivity of the diagnostic measures	26
	Current available therapies have modest treatment outcomes with no benefits in halting the disease or reducing the mortality	58
	Delayed referrals leading to advance disease conditions of patients	47
	Difficult to implement the treatment guidelines	16
What are the most concerning dilemmas with the treatment of ILD?	Large number of ILD types and etiology	37
	Poor treatment outcomes due to delay in diagnosis and relevant medical care	53

Continued on next page...

Continued from previous page...

	Limited ability to monitor both disease severity and the presence of adverse medication effects	16
	Novel therapies (anti-fibrotic drugs) only slowing the decline in FVC	37
What major challenges with Surgical Lung biopsies lead to delayed diagnosis?	Lack of sufficient availability of Thoracic surgeons	32
	Post-operations risk of exacerbations	32
	High risk of Pneumothorax after the procedure	26
	Invasive procedures are not usually accepted by patients and caregivers	74
HRCT is an integral part of the diagnostic process of ILD. What do you think could be the key hindrances in its appropriate utilization?	Affordability of the patients	53
	Radiological errors by radiologists or obsolete equipment used	16
	Not readily available in the geographic vicinity	26
	Unawareness among physicians regarding the classical radiological features of IPF and how to differentiate them from other differential diagnoses	63
Which type of lung biopsy is usually preferred in your region?	Bronchoalveolar Lavage	21
	Transbronchial Cryo Lung Biopsy	5
	Surgical Lung Biopsy	42
	Transbronchial Biopsy	47
Healthcare Policymakers & Organizations		
What should be the most urgent healthcare initiatives taken by the concerned healthcare policymaking authorities to control the poor prognosis of IPF patients?	Create ILD national registries to keep track of disease prevalence and challenges at hand	74
	Make the diagnostic tools accessible in all tertiary care set-ups for ILD-suspected patients	21
	Make disease-limiting drugs like Anti-fibrotic therapies accessible and affordable to IPF patients	53
	Training programmes for physicians and educating patients along with their caretakers should be initiated in order to eliminate the myths and misconceptions about the etiology, risk factors, diagnosis, and management of IPF	32
Which are the most effective self-management strategies to be incorporated and disseminated by the healthcare systems to ensure patient compliance, considering that the median survival rate of IPF is around 3.8 years?	Comprehensive patient education about the disease progression, diagnostic processes, and possible treatment options and their outcomes	84
	Training the patients regarding pulmonary rehabilitation techniques	37
	Educating the caregivers and their patients about palliative care and its importance in IPF	32
	Psychological and nutritional counseling so that the patients don't give up on themselves too early	26
What is essential in promoting a better quality of life to improve patient outcomes despite limited resources and poor disease prognosis?	Extra efforts by the research and development corporations to find a cure or disease-modifying therapies with better prognosis and easy accessibility	32
	Healthcare policymakers and authorities should focus their emphasis on creating IPF outreach centers to educate, treat and follow up with IPF patients	47
	Healthcare authorities should create local diagnostic, referral, and treatment guidelines for their physicians and pulmonologists to avoid delays in diagnosis and savor the narrow therapeutic window	47
	Diagnostic facilities and their affordability should be ensured for all the suspected patients so that the diagnosis of the specific type of ILD can be made timely	37
Why is there a lack of progress in research and development to counter the healthcare challenges IPF poses globally?	Being a rare and rapidly progressive idiopathic disease, Research and Development on IPF and its treatment is not financially viable for big corporations	63
	Governments try to shrug off the adversities of the disease as their focus is more on other epidemics and common communicable diseases	42
	Developing new biopsy techniques and other non-invasive diagnostic tools can be a very lengthy and expensive because there is a prolonged list of differential diagnoses	11
	Conducting clinical trials on IPF patients can have various ethical barriers like short survival rates due to delayed or misdiagnosis	32

Forced Vital Capacity (FVC); Idiopathic pulmonary fibrosis (IPF); Interstitial lung disease (ILD); High-Resolution Computed Tomography (HRCT)

caregivers. Future studies should examine how these materials affect the provision of care and patient and caregiver satisfaction. As this is the most appropriate

method to reach patients and caregivers at the desired level, models for distributing disease-related information/education in a dosed fashion should be

investigated¹⁴. Research is being done on the disease trajectory and behaviour of IPF, which could be included in this instructional material. Developing comprehensive, patient-centered care models includes knowledge of diseases as a key component.

It is also important to consider the opportunities and challenges associated with diagnosing and managing patients with IPF in LMICs utilizing first-hand experience^{15,16}. Additionally, problems like the accessibility of HRCT, spirometry, and a multidisciplinary diagnostic environment must be addressed, even if they wouldn't be a concern in high-income nations^{16,17}. Field specialists, healthcare organizations, and financial bodies must collaborate to create sensible and workable solutions to guarantee that IPF patients receive an accurate and timely diagnosis and appropriate access to therapy.

However, people with IPF frequently experience several comorbidities that should be properly diagnosed and treated, as well as various symptoms such as chronic cough and shortness of breath¹⁸. Therefore, these patients should get comprehensive care that includes non-pharmacological therapies to enhance the health-related quality of life rather than only addressing the progressive deterioration in lung function.

Conclusion

The survey determined that although a small percentage of patients with ILDs, specifically IPF, receive a prompt and accurate diagnosis, the more common diagnostic experience for those with ILD is marked by lengthy delays, frequent misdiagnosis, exposure to expensive and invasive diagnostic procedures, and significant use of healthcare resources. These results point to the need for the development of National ILD registries to keep track of the disease etiology and its challenges, new diagnostic gears, clinical practice standard procedures, more promising disease-modifying drugs, and HCPs education to promote timely referrals and diagnoses in patients with ILD.

Acknowledgment: The authors would like to acknowledge the Medical Affairs department of Getz Pharma for their technical support and assistance in the publication process.

Disclaimer: None.

Conflict of Interest: None.

Source of Funding: None.

References

- Cottin V, Wollin L, Fischer A, Quaresma M, Stowasser S, Harari S. Fibrosing interstitial lung diseases: knowns and unknowns. *Eur Respir Rev.* 2019;28(151):180100. doi: 10.1183/16000617.0100-2018.
- Albera C, Verri G, Sciarone F, Sitia E, Mangiapia M, Solidoro P. Progressive Fibrosing Interstitial Lung Diseases: A Current Perspective. *Biomedicines.* 2021; 9(9): 1237. doi: 10.3390/biomedicines9091237.
- Molina-Molina M, Aburto M, Acosta O, Ancochea J, Rodríguez-Portal JA, Sauleda J, Lines C, Xaubet A. Importance of early diagnosis and treatment in idiopathic pulmonary fibrosis. *Expert Rev Respir Med.* 2018;12(7):537-539. doi: 10.1080/17476348.2018.1472580.
- Ley B, Collard HR, King Jr TE. Clinical course and prediction of survival in idiopathic pulmonary fibrosis. *Am J Respir Crit Care Med.* 2011;183(4):431-40. doi: 10.1164/rccm.201006-0894Cl.
- Luppi F, Kalluri M, Faverio P, Kreuter M, Ferrara G. Idiopathic pulmonary fibrosis beyond the lung: Understanding disease mechanisms to improve diagnosis and management. *Respir Res.* 2021;22(1):109. doi: 10.1186/s12931-021-01711-1.
- Mason W, McLaughlin S, Dedopoulos S, Mahoney E, Meadows T, Stauffer JL, Lancaster LH. Real-world comprehensive disease management of patients with idiopathic pulmonary fibrosis. *Curr. Respir. Med. Rev.* 2019;15(1):4-15. doi: 10.2174/1573398X15666190212155051
- Furini F, Carnevale A, Casoni GL, Guerrini G, Cavagna L, Govoni M, Sciré CA. The role of the multidisciplinary evaluation of interstitial lung diseases: systematic literature review of the current evidence and future perspectives. *Front Med (Lausanne).* 2019; 6: 246. doi: 10.3389/fmed.2019.00246
- McLean AE, Webster SE, Fry M, Lau EM, Corte P, Torzillo PJ, Troy LK, Jo HE, Geis M, Rhodes JE, Cleary S. Priorities and expectations of patients attending a multidisciplinary interstitial lung disease clinic. *Respirology.* 2021;26(1):80-86. doi: 10.1111/resp.13913.
- Johansson KA, Chaudhuri N, Adegunsoye A, Wolters PJ. Treatment of fibrotic interstitial lung disease: current approaches and future directions. *Lancet.* 2021;398(10309):1450-1460. doi: 10.1016/S0140-6736(21)01826-2
- Klein S, Logan A, Lindell KO. A scoping review of unmet needs of caregivers of patients with pulmonary fibrosis. *Curr Opin Support Palliat Care.* 2021;15(4):226-232. doi: 10.1097/SPC.0000000000000571.
- Slido. (n.d.). Slido: Live Q&A, Polls & Networking for Virtual and Hybrid Events. Available at: https://www.slido.com/?experience_id=17-a Cited on 01. June, 2023
- Peikert T, Daniels CE, Beebe TJ, Meyer KC, Ryu JH, Interstitial Lung Diseases Network of the American College of Chest Physicians. Assessment of current practice in the diagnosis and therapy of idiopathic pulmonary fibrosis. *Respir Med.* 2008;102(9):1342-1348. doi: 10.1016/j.rmed.2008.03.018.
- Ahmed M, Faryal S, Sheikh K. Pulmonary function tests vary in different cities of Baluchistan, Pakistan. *IJEHSR.* 2017;5(2):21-27. Doi: 10.29052/IJEHSR.v5.i2.2017.21-27
- Ramadurai D, Corder S, Churney T, Graney B, Harshman A, Meadows S, Swigris JJ. Idiopathic pulmonary fibrosis: educational needs of healthcare providers, patients, and caregivers. *Chron Respir Dis.* 2019;16:1479973119858961. doi: 10.1177/1479973119858961.
- Cosgrove GP, Bianchi P, Danese S, Lederer DJ. Barriers to timely diagnosis of interstitial lung disease in the real world: the INTENSITY survey. *BMC Pulm Med.* 2018;18(1):9. doi: 10.1186/s12890-017-0560-x.
- Faiq S, Zehra S, Jafri S, Begum S. Rapid Screening: Post

- Computerized Tomography Incidence of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Features in Asymptomatic Patients. *IJEHSR*. 2022;10(2):249-254. Doi:10.29052/IJEHSR.v10.i2.2022.249-254.
17. Richeldi L, Rubin AS, Avdeev S, Udwadia ZF, Xu ZJ. Idiopathic pulmonary fibrosis in BRIC countries: the cases of Brazil, Russia, India, and China. *BMC Med*. 2015;13:237. doi: 10.1186/s12916-015-0495-0.
18. Raghu G, Richeldi L. Current approaches to managing idiopathic pulmonary fibrosis. *Respir Med*. 2017;129:24-30. doi: 10.1016/j.rmed.2017.05.017.
-