Fatality Of Idiopathic Pulmonary Fibrosis due to Anonymous Root and Vague Features!!!

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ABSTRACT
The disease Idiopathic Pulmonary Fibrosis (IPF) also known as Cryptogenic Fibrosing Alveolitis has received global attention as this illness resulted in large number of deaths. It is characterized by the progressive decline in the lungs functions that are irreversible. The cause (root) of this illness is Unknown and this is the major setback for complete cure. Several risk factors such as Smoking , Gastric Esophageal Disease, Environmental hazards such as exposure to Gases, mud, coal, smoke ,stone dust, hay dust and Mold spores, silica, wood and metal dust, Genetic and Viral infections etc. can pave way for this dreadful disease after years of exposure. The clinical symptoms and signs are vague and non specific like dry cough aggravated on exertion, difficulty in breathing during exertion, Clubbing of the fingers and bilateral basal Crackles on auscultation. IPF occurs because of the aberrant wound healing processes involving abnormal and excessive collagen deposition in the pulmonary interstitium with inflammatory changes. The repetitive injuries in IPF occurs to the lung alveolar epithelial cells, the type 1 and type II cells , adjoining the alveolar surfaces .The diagnosis of this ailment is primarily clinical, including identifying potential risk factors such as exposure to inhalation pollutants. However, various evaluations like Chest Xray, CT Scan, Pulmonary Function tests, Biomarkers estimation and Lung biopsy can assist in confirming the diagnosis and Idiopathic Pulmonary Fibrosis(IPF) is a disease with no cure. Various supportive treatments like Medications, Oxygen Therapy, Breathing exercises to some extent delay the disease progression. A complete Cure of this ailment can reduce the definite mortality of these patients.

INTRODUCTION/ BACKGROUND:

A chronic and a serious ailment with unknown causes resulting in death in a short span of time after the initiation of non specific symptoms and signs attracts more in depth research and with therapy that can completely cure the same. It is the disease Idiopathic Pulmonary Fibrosis(IPF) also known as Cryptogenic Fibrosing Alveolitis that has recently received global attention as this disease has resulted in large number of loss of lives from the population during the past few decades. A mystery disease with vague constitutional clinical manifestations accentuates the disease in a very swift manner making the early diagnosis a remote possibility. The diagnostic modalities and parameters too are not confirmatory, specific and cost effective. Adding to the agony is the non availability of complete cure regimen apart from the symptomatic supportive treatment. All these disadvantages and demerits gets piled up in all the spheres of the disease Idiopathic Pulmonary Fibrosis due to the non

existent specific etiology till date. The aforementioned aspects of this mystery disease makes this as a topic of interest in today's scenario as it is mandatory to curtail the progression of the disease leading onto death. Many patients suffering from this ailment are losing their lives without the specific treatment for the same. The supportive regimen gives a little bit of solace but never to the ultimate satisfaction.[1-3]

The synonym of idiopathic Pulmonary Fibrosis is Cryptogenic Fibrosing Alveolitis and it is a rare and progressive disease of the respiratory system due to the thickening and stiffening of the lung tissues surrounding the alveoli resulting in the scar tissue formation. It is Ultimately characterized by the progressive and decline in the functions of the lungs that is irreversible.[1-4] The cause of this illness is Unknown and hence Idiopathic Pulmonary Fibrosis is not completely Curable. Males in the 60 to 70 years age group are predominantly affected by this disease. There are several lifestyle risk factors such as Smoking , Reflux Esophagitis, Environmental hazards such as exposure to Gases, mud, coal, smoke ,stone dust, hay dust and Mold spores, silica, wood and metal dust, Agriculture and Livestock Occupations etc. that can commonly lead onto this dreadful disease after years of exposure. Genetic and Viral infections such as the flu, Epstein-Barr virus (which causes mononucleosis), Hepatitis and Herpes are also risk factors triggering the pathogenesis of this illness with manifestations of non specific constitutional symptoms and signs making the early diagnosis and treatment initiation as an impossibility. The clinical symptoms and signs are vague and non specific: Persistent dry cough aggravated on exertion, progressive difficulty in breathing especially during walking, bilateral basal crepitations during auscultation, clubbing of the fingers, a bulging disfigurement at the distal phalanges.[1-4]

Idiopathic Pulmonary Fibrosis is the disease of Unknown etiology. The occurrence of fibrosis in IPF is usually due to smoking, environmental and occupational factors such as gases, smoke, chemicals or dusts), other medical conditions including gastroesophageal reflux disease or as a result of genetic (Familial) predisposition. The peculiarity is none of these are present in all people with IPF.

IPF is the result of the disorganised wound healing processes involving abnormal and excessive collagen deposition in the pulmonary interstitium with inflammatory changes. [5-7] The repetitive injuries in IPF occurs to the lung alveolar epithelial cells, the type I and type II cells, lining the alveolar surfaces. When type I cells are damaged or lost, it is proposed that type II cells undergo proliferation to mask the exposed basement membranes. During normal repair, the hyperplastic type II cells undergo death and the remaining cells spread and undergo differentiation to convert into type I cells. In case of pathological conditions and due to the presence of transforming growth factor beta (TGF-β),enormous amounts of fibroblasts tend to accumulate in these areas of damage and get differentiated into myofibroblasts that secrete collagen and other inflammatory proteins .The IPF usually occurs by way of the formation of a usual interstitial pneumonia lesion, which in due course undergoes the aforementioned pathological condition typical of IPF. Consistent repeated injury mechanisms denote that IPF may result not only from a Usual Interstitial Pneumonia lesion, but also from the nonspecific interstitial pneumonia and diffuse alveolar damage lesions, or a combination of several mechanisms.[5-8]

Inflammation is the initiating event resulting in lung tissue scarring. On the contrary, the development of fibroblastic foci precedes the accumulation of inflammatory cells leading to the deposition of collagen. The IPF is a multi-mechanistic one, wherein the trigger for the disease originate from the number of wound healing pathways abnormalities. Those abnormalities occur in the pathways of clotting cascade, antioxidant pathways, apoptosis, inflammatory cytokines, angiogenesis and vascular re-modelling, growth factors, surfactant and matrix regulatory factors and attempts at treating or circumventing the complications in all these pathways may pave way for the successful therapies.[1,5-8]

Familial IPF contributes for the minor share of the total IPF patients and is clinically and histologically indistinguishable from other IPF causes. Genetic associations include mutations in pulmonary surfactant proteins A1, A2, C (SFTPA1, SFTPA2B) and mucin (MUC5B). An important aspect of the MUC5B variant is its high frequency of detection. Mutations in human telomerase genes results with

familial pulmonary fibrosis and also in some patients with sporadic IPF with other causes (e.g. the TERT, TERC genes). An X-linked mutation in a third telomerase-associated gene, dyskerin (DKC1), is an added contributory factor in a family with IPF.[9-10]

The diagnosis of IPF is primarily clinical, including identifying potential risk factors such as exposure to inhalation pollutants. However, various evaluations can assist in confirming the diagnosis .Chest scans can reveal shadows on the lungs depicting scar tissue. The earlier stages of IPF can be spotted in an accurate and detailed way using HRCT scan (high-resolution computed tomography). Pulmonary Function Tests are done using a spirometer to measure the functions of the lungs..
Pulse oximetry is used to check the oxygen level in arteries. Arterial Blood Gas Analysis test is utilized to monitor oxygen and carbon dioxide levels. Tuberculosis causes symptoms mimicking IPF. So an intradermal test is done to rule out this disease. Exercise tests are done to measure the effectiveness of lungs pushing oxygen through bloodstream during body activity. Lung biopsy is done to check under a microscope for signs of scarring or other diseases.[3,11,12]
The peripheral blood biomarkers that may be directly involved in the development of IPF, including KL-6, surfactant proteins A and D, matrix metalloproteases (MMP) 1 and 7, CCL18, VEGF, YKL-40, Osteo pontin, circulating fibrocytes, and T cells can be estimated.[13-19] Advocating methods of clinical assessments, review of medical history, radiologic imaging, histology of biopsy samples, bronchoalveolar lavage (BAL), and serology are used to exclude similar diseases in the differential diagnosis like Heart Failure, Interstitial Idiopathic Pneumonias, Usual Interstitial Pneumonia etc.
Also other Diseases Mimicking IPF are chronic obstructive pulmonary disease (COPD), sarcoidosis, eosinophilic pneumonia, lung cancer, and infections. COPD can be differentiated from IPF through radiologic analyses. Sarcoidosis, eosinophilic pneumonia, lung cancer, and lung infections can specifically be diagnosed through the analysis of Broncho Alveolar Lavage fluid looking for signs of malignancy, infection, cell proportions, or CD4/CD8 ratios.[1,11,20]
Idiopathic Pulmonary Fibrosis (IPF) is a disease with no cure. Treatment options include antifibrotic agents such as nintedanib and pirfenidone and medications for Gastric Esophagial Reflux Disease. Quitting Smoking is advised and oxygen therapy may be required to improve the shortness of breath and making exercise easier. Pulmonary rehabilitation to tackle the symptoms and improve the ability to perform day to day activities.Physical exercises and Breathing techniques helps to improve the lung capacity and effective utilization of oxygen. Nutritional counselling, Psychological counselling and support will be required.Ventilator support may be required to aid with breathing. Lung transplantation may be the last option for patients with serious IPF.[21-24]

CONCLUSION:

The highest degree of Optimism is before this article gets Published let us hope a miraculous Breakthrough in the complete cure of this Idiopathic Pulmonary Fibrosis or else in delaying the progression of the disease thereby reducing the morbidity of the conditions ultimately leading to a Normal life expectancy for the affected individuals. Every dark Cloud has a silver Lining to be converted into a reality of bright light in the form of effective therapeutic regimen to completely cure this dreadful disease. This has become a non reality because of its idiopathic nature disabling to target the cause in the total alleviation of the disease. A thorough List of Investigations to be performed meticulously to rule out the other Differential Diagnosis of IPF at the earliest thereby enabling for earlier diagnosis. Supportive Treatment instituted at the earliest can lessen the symptoms and signs thereby improving the quality of the life of patients. Unknown Etiology(root) and Presentation Of Vague clinical features are the major setbacks contributing for the Idiopathic Pulmonary fibrosis Patients Fatality. Avoidance of the various Risk factors of IPF and adopting healthy lifestyle with due attention and intervention of the non specific constitutional symptoms and signs can to a major extent arrest the progression of this irreversible illness. There are many Biomarkers that are Diagnostic and prognostic indicators of IPF. If these Biomarkers are developed as Interventional Or Therapeutic Biomarkers arresting completely the Bio pathogenesis of IPF through favorable and successful breakthrough challenges of research, will certainly carve a niche in the history of this dreadful fatal

disease as a savior of our Humankind in the long run…. Let us await with strong Hopes on this major and Historical milestone in the field of Medicine……. !!!

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