

Serum Surfactant Protein D as a Prognostic Factor in Idiopathic Pulmonary Fibrosis Patients

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Abstract

Pulmonary fibrosis (PF) is defined as a specific form of chronic fibrosing interstitial pneumonia that is limited to the lung and associated with the histological appearance of UIP on a surgical lung biopsy. The diagnosis of IPF can only be made after the exclusion of other known causes of interstitial lung disease such as drug toxicities, environmental exposures, and collagen vascular diseases.

ILD is a collection of non-neoplastic lung disorders, both acute and chronic, that present with variable degrees of inflammation and fibrosis. ILD is also termed diffuse parenchymal lung diseases (DPLD).

The IIPs are defined by the ATS/ERS consensus classification as seven distinct disease entities. IPF is the most common IIP and its diagnosis is reserved for patients whose biopsy reveals the UIP pathology or in whom the clinical presentation and high-resolution computed tomography (HRCT) reveal a characteristic pattern.

Key Words:

Pulmonary Fibrosis, Idiopathic Pulmonary Fibrosis, Pulmonary Surfactant.

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Table of Contents

List of Abbreviations.....	I
List of Figures.....	III
List of Tables.....	V

Introduction and Aim of Work.....	1
Review of Literature	4
Chapter One: Pulmonary Fibrosis	5
Chapter Two: Idiopathic pulmonary fibrosis	16
Chapter Three: Pulmonary Surfactant	40
Patients and Methods	53
Results	60
Discussion	74
Summary	83
Reference	88
Appendix	101
Arabic Summary	109

List of Abbreviations

(in alphabetical order)

A-A Gradient	Alveolar-to-Arterial Oxygen Gradient
AIP	Acute Interstitial Pneumonia
ARDS	Adult Respiratory Distress Syndrome
ATS	American Thoracic Society
BAL	Bronchoalveolar Lavage
cAMP	Cyclic Adenosine Monophosphate
CFA	Cryptogenic Fibrosing Alveolitis
COP	Cryptogenic Organizing Pneumonia
DAD	Diffuse Alveolar Damage
DIP	Desquamative Interstitial Pneumonia
DPLD	Diffuse Parenchymal Lung Diseases
EGF	Epidermal Growth Factor
ERS	European Respiratory Society
FRC	Functional Residual Capacity
FVC	Forced Vital Capacity
GM-CSF	Granulocyte-macrophage colony-stimulating factor
HRCT	High-Resolution Computed Tomography
HSV	Herpes Simplex Virus
IIP	Idiopathic Interstitial Pneumonias
ILD	Interstitial Lung Disease
IPF	Idiopathic pulmonary fibrosis

IRDS	Infantile Respiratory Distress Syndrome
LIP	Lymphocytic Interstitial Pneumonia
mRNA	Messenger Ribonucleic Acid
NHLBI	National Heart, Lung and Blood Institute
NSIP	Non-Specific Interstitial Pneumonia
PDGF	Platelet-Derived Growth Factors
PF	Pulmonary fibrosis
RB-ILD	Respiratory Bronchiolitis–Associated Interstitial Lung Disease
RV	Residual Volume
SP-A	Surfactant Protein – A
SP-D	Surfactant Protein – D
SP	Surfactant Protein
TGF-β	Transforming Growth Factor-Beta
TLC	Total Lung Capacity
TNF-α	Tumor Necrosis Factor-Alpha
UIP	Usual Interstitial Pneumonia
VATS	Video-Assisted Thoracoscopy

List of Figures

Number	Subject	Page
Figure (1)	Spatial heterogeneity (areas of fibrosis alternating with areas of normal parenchyma) and temporal heterogeneity are characteristic Subpleural and paraseptal histopathologic differential diagnoses.	9
Figure (2)	A characteristic feature of the disease is the subversion of the lobular architecture produced by the fibrosis.	10
Figure (3)	The ground-glass may be linked not only to the presence of areas of alveolitis and active fibroblast proliferation, but also to the intralobular septal thickening caused by mild fibrosis.	11
Figure (4)	Posteroanterior chest radiograph of a 67-year-old man with progressive dyspnea revealing bilateral reticular infiltrates with lower lobe predominance.	30
Figure (5)	Computed tomography scan illustrates the “classic” features of idiopathic pulmonary fibrosis (IPF). Bilateral, peripheral, and subpleural reticular infiltrates are evident.	33
Figure (6)	A. Low-magnification photomicrograph of usual interstitial pneumonia (UIP) showing the characteristic heterogeneous involvement of the parenchyma. Zones of interstitial fibrosis are seen alternating with areas of normal lung. B. Higher magnification demonstrates enlarged cystic airspaces lined with hyperplastic alveolar epithelium (arrowheads). Beneath themucosal layer is an advancing region of young fibrosis	35

	containing loose extracellular matrix (pale pink staining) and fibroblasts (arrows).	
Figure (7)	Scanning view of usual interstitial pneumonia (UIP) demonstrates the characteristic variegated appearance of UIP. Note the honeycomb change (arrowheads) present in the region of dense fibrosis adjacent to the pleural surface. A fibroblast focus (arrow) is seen at the leading edge of advancing fibrosis.	35
Figure (8)	Structure of Tubular myelin.	44
Figure (9)	Life cycle of pulmonary surfactant.	44
Figure (10)	Pulmonary collectins: surfactant proteins A and D.	46
Figure (11)	Mean $\pm$ SD FEV1 (L) in different studied groups.	64
Figure (12)	Mean $\pm$ SD FVC (L) in different studied groups.	65
Figure (13)	Mean $\pm$ SD FEV1/FVC (%) in different studied groups.	66
Figure (14)	Mean $\pm$ SD of Serum Surfactant Protein D level (ng/ml) in different studied groups.	68
Figure (15)	Serum Surfactant Protein D level (ng/mL) in relation to FEV1 (L).	70
Figure (16)	Serum Surfactant Protein D level (ng/mL) in relation to FVC(L)	71
Figure (17)	Serum Surfactant Protein D level (ng/mL) in relation to pulmonary function tests.	72
Figure (18)	Typical images of two types of IPF distinguished by characteristics on chest HRCT. (A) GGO-dominant type. (B) PCO-dominant type.	104
Figure (19)	Idiopathic pulmonary fibrosis - Three CT images	105
Figure (20)	High-resolution CT shows patchy ground-glass opacities and fibrosis with reticulation and traction bronchiectasis	106

List of Tables

Table Number	Subject	Page
Table 1	Surfactant Protein D: Function - page 45	47
Table 2	Means $\pm$ SD of age and smoking status, and P-Value of duration of smoking (per-month) and the number of cigarettes (per-day) in different studied groups.	61
Table 3	Mean $\pm$ SD and P-Value of Pulmonary Function Test (PFT) in studied groups.	62
Table 4	Mean $\pm$ SD and P-Value of Serum Surfactant Protein D (ng/ml) level in different studied groups.	67
Table 5	Serum Surfactant Protein D level (ng/ml) in relation to pulmonary function tests.	69
Table 6	Serum Surfactant Protein D level (ng/ml) in relation to smoking duration per-month and number of cigarettes per-day.	73
Table 7	Serum Surfactant Protein D level (ng/ml) in relation to age.	73
Table 8	The recruitment, microbiologic diagnosis, susceptibility results of the study, and the background characteristics of ITT patients.	102

Introduction

and Aim of Work

Introduction and Aim of Work

Idiopathic pulmonary fibrosis (IPF) carries a 50% 5-years survival rate (*Day; 1994*). Current therapies are only marginally effective in improving pulmonary function or survival time. The pathogenesis of IPF is characterized by excessive wound healing with chronic inflammation, fibroblast proliferation and extracellular matrix production with chronic scarring and honeycomb formation. This fibroproliferative response is uniformly accompanied by type II cell hyperplasia (*Walker; et al., 1986*). The hydrophilic surfactant proteins (SP)-A and SP-D belong to the collection subgroup of the C-type lectin superfamily, along with mannose-binding glycoproteins and collectin CL43 (*Voorhout; et al., 1992*). Two types of nonciliated epithelial cells, in the peripheral airways, Clara cells and alveolar type II cells produce these lung collectins (*Jeffrey and Ann; 2008*).

Surfactant proteins –D (SP-D), produced and secreted by type II cells, can be detected in serum and are elevated in patients with certain inflammatory lung diseases, including IPF (*Voorhout, et al.; 1992; Sinclair, et al.; 2003; Shulenin, et al.; 2004; and Jeffrey and Ann; 2008*). Although the exact mechanism for the increase in SP-D in the circulation is not known, it is probably a combination of a loss of epithelial integrity due to injury and an increased mass of type II cells due to hyperplasia. Because the concentrations of serum SP-D probably vary with disease and lung inflammation, measurement of these two proteins might prove to be useful markers for the pathogenesis and detection of IPF (*Wert, et al.; 2000; Whitsett and Weaver, 2002; Ikegami, et al.; 2005*).

The aim of the present study is to investigate the possible role of SP-D in the pathogenesis and prognosis of idiopathic pulmonary fibrosis patients.

Review of
Literature

Chapter One

Pulmonary Fibrosis