The changing shape of patients with idiopathic pulmonary fibrosis

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Background:

Idiopathic pulmonary fibrosis (IPF) is a progressive, irreversible and ultimately fatal disease. An association between diabetes, obesity and IPF has previously been demonstrated (1). Decreasing body mass index (BMI) is predictive of worse survival in Japanese cohorts (2).

Objective:

To investigate the metabolic characteristics in our cohort of IPF patients (South West Peninsula, England) receiving anti-fibrotic therapy (nintedanib or pirfenidone), observe how BMI changes over time and relationships with changes in forced vital capacity (FVC) and survival.

Method:

Data was collected from IPF patients at the Regional Exeter ILD Centre at diagnosis (age, gender, FVC, BMI, co-morbidities) and subsequent appointments (FVC and BMI). Change between BMI/FVC at diagnosis and most recent BMI/FVC were calculated and standardised to time elapsed between data points (ΔBMI or ΔFVC respectively). National data were from Public Health England (2014 datasets).

Results:

We reviewed 90 patients receiving antifibrotics. 76 were male (84%), mean age was 74. Their co-morbidities are illustrated by table 1. Type 2 diabetes mellitus affected 14 patients (16%), compared with 12% in the age-adjusted general population. Recent BMIs were available for 46 patients. 10 patients (20%) had a normal BMI 18.5-24.99 (compared with a national average of 37%). Mean BMI (28.3) was significantly increased above the national average (27.3; $p<0.05$ one-tailed t-test). Pearson correlation coefficient for change in BMI and survival was r= -0.55, 95% confidence interval -0.90 to 0.25 (8 patients). Where ΔBMI and ΔFVC were temporally overlapping (19 patients), no correlation was found.

Conclusions:

A large proportion of our IPF cohort were classified as obese. Diabetes was a common comorbidity, and higher than the national average. Over time, most patients demonstrated a reduction in their

BMI. In contrast to East Asian data, this reduction in BMI did not correlate with reduction in FVC or survival.

IPF patients	**n=90**
Age (years) (SD)	74 (9)
Gender, male	76 (84%)
Current Treatment	**n=90**
Nintedanib	55 (61%)
Pirfenidone	35 (39%)
Comorbidities	
Ischaemic heart disease	23 (26%)
Hypertension	18 (20%)
Gastroesophageal Reflux Disease	17 (19%)
Type 2 Diabetes Mellitus	14 (16%)
Osteoarthritis	9 (10%)
Hypothyroidism	7 (8%)
Hypercholesterolaemia	6 (7%)
Asthma	5 (6%)
Inflammatory bowel disease	3 (3%)
Other connective tissue disease	3 (3%)
Gout	3 (3%)
Chronic Kidney disease	2 (2%)
Obstructive sleep apnoea	1 (1%)
WHO BMI Classification	**n=46**
Underweight (<18.5)	0
Normal (18.5 - 24.99)	10 (22%)
Pre-obese (25-29.99)	17 (37%)
Obese Class 1 or 2 (30-39.99)	18 (39%)
Obese Class 3 (>40)	1 (2%)
Delta BMI (change in BMI per month)	**n=43**
Median (SD)	-0.05 (0.2)
Range	-0.41 to +0.63 per month
Delta FVC (Change in FVC per month)	**n=44**
Median (SD)	-0.3% (0.81%)
Range	-2.44% to +1.5%

Table 1: Characteristics of the Exeter IPF cohort. SD = standard devation

1. Kim Y J, Park J-W, Kyung Y et al. Association of Diabetes Mellitus and Metabolic Syndrome with Idiopathic Pulmonary Fibrosis. *Tuberc Respir Dis.* 2009;67: 113-120
2. Kishaba T, Nagano H, Nei Y, et al. Body mass index—percent forced vital capacity—respiratory hospitalization: new staging for idiopathic pulmonary fibrosis patients. J Thorac Dis 2016;8(12):3596-3604