

P17 RESPIRATORY IMPACT OF DIABETES MELLITUS IN PEOPLE WITHOUT A PRIMARY DIAGNOSIS OF CHRONIC LUNG DISEASE

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Introduction In the UK, around 3 million people currently have a diagnosis of diabetes mellitus and the prevalence is increasing rapidly. Microvascular and macrovascular complications of diabetes are widely recognised, but the respiratory impact is less well understood. In people with chronic lung disease, diabetes mellitus is associated with worse lung function, impaired health status and more frequent exacerbations (Kinney *et al.* Diabetes Care. 2014;37:389–95). The aim of our study was to determine the respiratory impact of diabetes in people without a primary diagnosis of chronic lung disease.

Abstract P17 Table 1 Comparison of clinical characteristics, prior respiratory illness, lung function and respiratory symptoms in people with and without diabetes mellitus

	No diabetes mellitus	Diabetes mellitus	P value
Clinical characteristics			
Number	175	75	
Age (years)	66 ± 11	67 ± 9	0.257
Gender (n (%) female)	56 (32%)	22 (29%)	0.677
Body mass index (kg/m ²)	28.2 ± 5.7	32.1 ± 7.7	<0.001
Waist:hip ratio	0.94 ± 0.07	0.97 ± 0.07	0.001
Blood glucose mmol/l (n)	5.9 ± 1.7 (45)	9.0 ± 3.2 (54)	<0.001
HbA _{1c} mmol/mol (n)	41 ± 6 (31)	61 ± 16 (29)	<0.001
Diabetic medication (n (%))			
None		11 (15%)	
Oral hypoglycaemics		51 (68%)	
Insulin (±oral hypoglycaemics)		13 (17%)	
Confirmed coronary artery disease (Gensini >20)	36%	42%	0.037
Charlson index (excluding diabetes)	3 (2–4)	3 (2–4)	0.026
Smoking history and respiratory illness			
Smoking status (n (%))			
Never	41%	44%	0.873
Ex-smoker	46%	45%	
Current smoker	13%	11%	
Childhood respiratory illness (n (%))	30 (17%)	18 (24%)	0.139
On respiratory medication (n (%))	40 (23%)	16 (21%)	0.474
Prior COPD diagnosis (n (%))	22 (13%)	7 (9%)	0.314
Prior diagnosis of any chronic lung disease (n (%))	28 (16%)	18 (24%)	0.092
Lung function			
FEV ₁ % predicted	83 ± 21	79 ± 18	0.134
FVC% predicted	91 ± 22	82 ± 17	0.002
FEV ₁ :FVC	0.72 ± 0.11	0.76 ± 0.09	0.008
Respiratory symptoms			
Breathlessness (mMRC)	1.7 ± 0.7	2.1 ± 0.9	0.001
Cough (/5)	0.6 ± 1.1	1.0 ± 1.3	0.005
Phlegm (/5)	0.4 ± 0.9	0.5 ± 1.0	0.813
Total CAT score	7 ± 5	9 ± 7	0.024

COPD, chronic obstructive pulmonary disease; FEV₁, forced expiratory volume in 1 s; FVC, forced vital capacity; mMRC, modified Medical Research Council dyspnoea scale; CAT, COPD assessment test.

Values are mean±SD (compared with independent t tests), median (interquartile range) (compared with Mann Whitney U tests) and number (%) (compared with chi squared tests).

Methods Unselected patients attending for elective coronary angiography March–July 2015 were invited to take part in a prospective observational study (primary aim to investigate the association between coronary atheroma and airflow obstruction). Participants underwent clinical assessment and spirometry prior to the procedure.

Results 250 of 294 (85%) people approached took part. Seventy five (30%) had diabetes mellitus. People with diabetes were of similar age and gender to those without diabetes, but had greater body mass index, central adiposity, blood glucose and HbA_{1c} (Table 1). Despite no differences in history of smoking or respiratory illness (Table 1), people with diabetes had significantly lower forced vital capacity (FVC) and higher forced expiratory volume (FEV₁): FVC ratio than those without diabetes. After adjustment for age, gender, body mass index, waist: hip ratio and smoking history, diabetes was an independent predictor of FEV₁: FVC (partial eta² 0.03, p = 0.007), but not FVC. People with diabetes had more respiratory symptoms (Table 1). They were more likely to give a history of recurrent chest infections (diabetes 14(19%); no diabetes 11(6%), p = 0.004) and reported more chest infections (diabetes 0.6 ± 1.6; no diabetes 0.2 ± 0.9, p = 0.007) in the past year. After adjustment for age, waist: hip ratio, body mass index, smoking, FEV₁: FVC and co-existing respiratory disease, diabetes was an independent predictor of recurrent chest infections (odds ratio 2.81 (95% confidence intervals 1.04–7.73), p = 0.045).

Conclusions Diabetes mellitus is associated with worse lung function, increased respiratory symptoms and more frequent chest infections, independent of smoking and prior respiratory illness. The burden of diabetes-associated respiratory disease on patients and the NHS is likely to increase as diabetes becomes more prevalent.

P18 THE EFFECTS OF ACUTE AND REPEATED BOUTS OF UNILATERAL NEUROMUSCULAR ELECTRICAL STIMULATION ON QUADRICEPS MUSCLE INFLAMMATION IN COPD

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Introduction and objectives Impaired skeletal muscle function is an important systemic manifestation of COPD which can be improved by exercise training. Non-volitional training using neuromuscular electrical stimulation (NMES) may be an effective training technique in situations where voluntary exercise may be difficult or impractical (e.g. peri-exacerbation or severe ventilatory limitation). Exercise is known to result in both intramuscular and systemic inflammation. However, the cellular response to NMES, which directly depolarises the motor units, is unclear. We investigated the impact of acute and repeated bouts of unilateral NMES in COPD patients.

Methods 16 patients underwent 6 weeks of unilateral NMES 5 times a week for 30 min at 50 Hz at Glenfield Hospital, Leicester. Mean (SD) age was 65 (9) years, FEV₁: 50 (22)% predicted, BMI 26.5 (5.2) Kg/m². Isometric quadriceps strength, regional muscle mass (DEXA) and quadriceps thickness (ultrasound) were recorded at baseline and at the end of the intervention. Vastus lateralis muscle biopsies were obtained from both the trained and untrained limbs at baseline, 24 h after the first bout of NMES and at 6 weeks. Venous blood was taken at the same