Abstract P45 Figure 1  ROC comparing all CMRI mPAP predictive models for making a diagnosis of PH

REFERENCES

P46 ASSESSMENT OF AORTIC STIFFNESS AND CORRELATION WITH LUNG FUNCTION IN PATIENTS WITH COPD USING CARDIAC MAGNETIC RESONANCE

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Introduction: COPD has been associated with increased cardiovascular risk, although the mechanisms for this are still unclear. Proposed theories include increased systemic inflammation and accelerated ageing resulting in arterial stiffness. We aimed to evaluate aortic distensibility using cardiac MRI in patients with COPD compared to an age-matched non COPD, ‘healthy’ smoker control group.

Methods we recruited 49 subjects, of which 27 had diagnosis of COPD and FEV1/FVC < 70%; and 21 age-matched normal smoker controls (mean age 64 years ± 10). We acquired data including age, gender, smoking status, number of packs of cigarettes per year, and FEV1/FVC ratio. MRI images were acquired using a 3.0T scanner, and analysed using CVI42 software. Left ventricle and right ventricle function and volumes were evaluated using short axis SSFP cine. Aortic distensibility was measured using a validated method that takes in consideration aortic maximal and minimal areas from axial SSFP cine acquired perpendicular to the vessel.

Results Aortic distensibility was reduced in the COPD patients compared to control (0.0022610 × 10⁻³ mm Hg⁻¹ vs 0.004337 × 10⁻³ mm Hg⁻¹, p = 0.003). The distensibility of descending aorta was similar in both groups (p = 0.06). Ejection fraction and biventricular volumes were also similar in the two groups. Univariate analysis demonstrated a significant relationship between ascending aorta distensibility and FEV1/FVC ratio. There was no difference when comparing distensibility with smoking status or number of packs per year. Linear regression demonstrated that the degree of aortic distensibility was directly proportional to FEV1/FVC ratio.

Conclusion Patients with COPD have significantly increased aortic stiffness measured by cardiac magnetic resonance. This was observed in the presence of normal LV/RV systolic function in both groups. This difference was related to FEV1/FVC, and was independent of smoking. Preserved FEV1/FVC showed more elastic ascending aortas. Reduced aortic distensibility could represent the early phase changes in cardiovascular function but further research is needed.

Abstract P46 Figure 1  Contouring of ascending and descending aortic area on axial SSFP cine

P47 THE INFLUENCE OF MUSCLE MASS IN THE ASSESSMENT OF LOWER LIMB STRENGTH IN COPD

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Introduction and objectives Lower limb muscle strength measured by Quadriceps Maximal Voluntary Contraction (QMVC) provides valuable functional and prognostic information in people with COPD. Reference equations providing normal values for QMVC have been reported, some requiring measurement of muscle mass. It is unclear whether including muscle mass in the calculation significantly alters predicted values in COPD. We addressed this question by deriving reference equations for QMVC with and without the inclusion of whole body assessment of muscle mass in a cohort of healthy volunteers and...
subsequently comparing QMVC assessment using these reference equations in two separate cohorts of patients with COPD.

**Methods** Prediction equations were derived through multiple linear regression in a healthy control (HC) group. Age, gender, height and weight were inputted into the first model (FFM-model) and fat-free mass (FFM) added for the other (FFM+ model). The prediction equations were then applied to a Primary Care COPD (PCC) group and Complex Care COPD (CCC) group of patients where percentage predicted values were calculated and weakness determined using a threshold of the lower limit of normal.

**Results** 175 HC subjects (median (IQR) age: 54 (14) years, 31% male) were recruited. The PCC group comprised 87 patients (median (IQR) age: 68 (9) years, 71% male, FEV1 62 (20)% predicted) and the CCC group 189 patients (median (IQR) 66 (12) years, 57% male, FEV1: 29 (16)% predicted).

Prediction values for the HC and PCC were similar between the FFM− and FFM+ models as shown in the table. In the CCC group compared to the FFM+ model, there were 11.9% more classified as weak by the FFM+ model compared to the FFM− model.

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<th>Healthy control</th>
<th>Primary care COPD</th>
<th>Complex care COPD</th>
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<td>n</td>
<td>175</td>
<td>87</td>
<td>189</td>
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**FFM Model**
- %pred QMVC: 100.3 (24.1) vs. 86.0 (22.0) vs. 54.0 (16.4)
- Number classified as weak (%): 6 (3.4%) vs. 14 (16.3%) vs. 101 (53.2%)

**FFM+ Model**
- %pred QMVC: 100.2 (24.1) vs. 86.7 (20.6) vs. 59.2 (17.8)
- Number classified as weak (%): 8 (4.6%) vs. 10 (11.6%) vs. 78 (41.3%)

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Mean (SD) values presented as a percentage of the values predicted (%pred) using the FFM− and FFM+ models. Abbreviations: FFM+: fat-free mass included, FFM− fat-free mass not included.

**Conclusion** The inclusion of fat-free mass did not significantly alter the prediction of muscle weakness in the healthy cohort. In the COPD cohorts, including FFM in the model altered the proportion classified as having muscle weakness, most notably in the CCC cohort. This is likely to be due to a higher prevalence of muscle wasting in this population which resulted in an underestimate of predicted strength when muscle mass is included in the model.