latory equivalent for CO_2 at anaerobic threshold ($EqCO_2$_AT), are increasingly being used as prognostic markers in heart failure and pulmonary arterial hypertension (PAH). Little is known about whether these measures can be applied to all forms of PH, in particular chronic thromboembolic pulmonary hypertension (CTEPH), where thrombotic vascular occlusion may an impact on gas exchange through increased dead space fraction.

Methods and results 127 patients, 77 with CTEPH and 50 with PAH, underwent incremental CPX. Ventilatory dead space fraction (V_D/V_T) measured at peak exercise with arterial blood gas analysis was higher in CTEPH than PAH (52.9 vs 41.8, p<0.001).The V_E/VCO_2 slope was higher in CTEPH patients than in PAH patients (50.7 vs 44.4, p=0.024) and was mirrored by similar changes in $EqCO_2$_AT (47.7 vs 42.0 p=0.008). Multivariate analysis demonstrated disease subtype to be a powerful independent predictor of V_D/V_T (p<0.001), V_E/VCO_2 slope (p=0.003) and $EqCO_2$_AT (p<0.001). These three measures could distinguish between WHO functional classes I/II and III/IV in PAH, but not CTEPH (Abstract S98 Figure 1). As a result of increased ventilatory inefficiency in CTEPH, breathing reserve was lower at peak exercise compared with PAH (29.0 vs 38.8, p=0.003) despite similar peak VO_2 and heart rate reserves.

Conclusion Significant differences in gas exchange exist between CTEPH and PAH, possibly due to differences in V_D/V_T as a result of vascular occlusion due to thromboembolic disease. These findings increase our understanding of the mechanisms of exercise limitation in subtypes of pulmonary hypertension, with increased dependence on gas exchange and ventilatory capacity in CTEPH. Furthermore these differences in gas exchange dissociate measures of ventilatory efficiency from disease severity in CTEPH. Caution should be applied in using common prognostic end-points from CPX in all forms of pulmonary hypertension.

S99 MULTIPLE REGRESSION ANALYSES IN A COHORT OF HEREDITARY HAEMORRHAGIC TELANGIECTASIA PATIENTS SUGGEST A NOVEL ROLE FOR IRON IN THROMBOSIS

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Introduction/objectives Pulmonary emboli (PE) secondary to deep venous thromboses (DVT) are the immediate cause of 10% of hospital deaths. Elevated basal plasma coagulation factor (F) VIII levels, now known to be synthesised by the pulmonary endothelium,[1] are the strongest predictor of recurrent PE/DVT, and also associated with elevated pulmonary artery pressure (PAP). The reasons for these associations are unknown. The study objectives were to determine whether novel patient-specific factors were associated with FVIII levels; PE/DVT; and/or PAP.

Methods Previous studies from our group have presented data on the 1999–2005 hereditary haemorrhagic telangiectasia (HHT) cohort of patients. In the current study, a replicate data series was generated from individuals seen between 2006 and 2010, and analysed independently to the first. Basal plasma FVIII measurements taken at least 4 months from any thrombotic event/intercurrent illness; and 32 patient-specific variables from 221 individuals, including catheter-measured PAP and verified DVT/PE, were entered into an Excel chart. Following verification, data were analysed using STATA v11c (Statacorp LP) software. Univariate analyses identified potentially associated variables, which were analysed using stepwise multiple regression analyses, to generate best-fit models.

Results For FVIII, the most significant independent variables were identified as fibrinogen, age, and iron replacement therapy (IRT) (model: 4df; p<0.0001; r^2 0.2014). Fibrinogen showed the most significant association with FVIII (OR 0.193, p<0.001). FVIII showed further associations with age (OR 0.006, p=0.028) and IRT (OR 0.162; p=0.075). PE/DVT was associated with IRT (OR 1.416, p=0.028). Mean PAP was associated with age (OR 0.079, p=0.007) and FVIII (OR 1.449, p=0.009). Iron deficiency did not emerge as significant in any model. SIREs software predicted specific iron response elements (IREs) in FVIII mRNA splice-variants, including one in the 5′UTR of splice-variant 2.[1]

Conclusions This study suggests that basal plasma FVIII levels, and associated clinical endpoints of PE/DVT and PAP, may be influenced by iron replacement therapy, possibly by modulating expression of specific splice-variants of the *F8* gene. This study therefore suggests that iron replacement may increase thrombotic risk, with significant potential clinical implications for millions of people who take iron tablets.

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S100 CHANGE IN DIASTOLIC PULMONARY ARTERY PRESSURE (3 MONTHS POST SURGERY COMPARED TO PRE-SURGERY VALUE) AS A LONG-TERM PROGNOSTIC PARAMETER IN PATIENTS TREATED WITH PULMONARY ENDARTERECTOMY FOR CHRONIC THROMBOEMBOLIC PULMONARY HYPERTENSION

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Introduction The definitive treatment for chronic thromboembolic pulmonary hypertension is pulmonary endarterectomy (PEA). Some patients are left with residual pulmonary hypertension after the surgery. We analysed post-PEA haemodynamics to assess their impact on long-term survival.

Methods We analysed systolic(sPAP), diastolic(dPAP) and mean (mPAP) pulmonary artery pressures, pulmonary vascular resistance (PVR) and changes (Δ) in these parameters measured at right heart catheterisation from pre-PEA to 3 months post PEA in 251 patients who underwent PEA in our centre in years 2000–2009. We assessed their usefulness as survival predictors using receiver operating characteristic (ROC) curves for 56 patients who completed at least 6 years follow-up. Eight of them died during this period, 48 survived. Subsequently, on the basis of ROC, we identified a cut-off value for change in diastolic pulmonary artery pressure (ΔdPAP), the parameter which had the biggest area under the curve (AUC). We divided the whole study population according to that value and performed Kaplan–Meier survival analysis.

Results AUCs were as follows: sPAP (0.57), ΔsPAP(0.7), dPAP(0.72), ΔdPAP(0.76), mPAP(0.66), ΔmPAP (0.71), PVR(0.65), ΔPVR(0.73). We chose 24.5 mm Hg as a cut-off value for change in dPAP. It was characterised by 100% specificity and 41.9% sensitivity in predicting death within 6 years post-PEA. Kaplan–Meier survival analysis (with time zero taken at time of right heart catheter 3 months post-PEA) for the whole group showed that patients with ΔdPAP>24.5 mm Hg had significantly better survival rates in comparison to patients with ΔdPAP<24.5 mm Hg (p=0.03)—Abstract S100 Figure 1. 13 of 59 patients with ΔdPAP>24.5 mm Hg still had pulmonary hypertension 3 months post-PEA. The overall 5-year survival of the whole group was 80.8%.

Conclusions 3 months post-PEA dPAP and ΔdPAP from pre-PEA values appeared to be the best survival predictor. The advantage of utilising dPAP is that it is a directly measured value and less susceptible to error then derived PVR.