PREDICTION OF MORTALITY IN PULMONARY EMBOLISM BASED ON LEFT ATRIAL VOLUME MEASURED ON CT PULMONARY ANGIOGRAPHY

Background: Preliminary reports suggest that a small left atrium (LA) is associated with severe acute pulmonary embolism (PE). This study used data derived from volumetric analyses of computed tomographic pulmonary angiography (CTPA) to investigate whether a reduced LA volume can predict adverse outcome in a large series of patients with acute PE.

Methods: We retrospectively analyzed 756 consecutive patients who received a diagnosis of acute PE by nongated CTPA between January 2007 and December 2010. Each CTPA was investigated with volumetric analysis software that automatically provides the volumes of the LA, right atrium, right ventricle, and left ventricle. A classification tree divided the cardiac chamber volumes and ratios into categories according to mortality. Cox regression assessed the association between these categories and 30-day mortality after adjustment for age, sex, and clinical background.

Results: The final study group consisted of 636 patients who had successful volumetric segmentation and complete outcome data. Eighty-four patients (13.2%) died within 30 days of PE diagnosis. There was a higher mortality rate among patients with an LA volume $\leq$ 62 mL compared with those with an LA volume >62 mL (19.6% vs 8.9%, respectively; HR, 2.44; P < .001), a left ventricle volume $\leq$ 67 mL (16.4% vs 8.3%; HR, 1.8; P = .024) and a right atrium/LA volume ratio >1.2 (17% vs 9.4%; HR, 2.1; P = .002). A reduced LA volume was the best predictor of adverse outcome.

Conclusions: Decreased LA volume is associated with higher mortality and is the first among the various cardiac compartments to predict mortality in patients with acute PE.

HEALTH-CARE PROVIDER SCREENING AND ADVICE FOR SMOKING CESSATION AMONG SMOKERS WITH AND WITHOUT COPD:2009-201 NATIONAL ADULT TOBACCO SURVEY

Background: Cigarette smoking is the predominant cause of COPD. Quitting can prevent development of and complications from COPD. The gold standard in clinician delivery of smoking cessation treatments is the 5As (ask, advise, assess, assist, arrange). This study assessed prevalence and correlates of self-reported receipt of the 5A strategies among adult smokers with and without COPD.

Methods: Data were analyzed from 20,021 adult past-year cigarette smokers in the 2009-2010 National Adult Tobacco Survey, a nationally representative telephone survey of US adults 18 years of age and older. Past-year receipt of the 5As was self-reported by participants who saw a clinician in the past year. Logistic regression was used to estimate the likelihood of receipt of each of the 5As by COPD status, adjusted for sociodemographic and smoking characteristics.

Results: Among smokers, those with COPD were more likely than those without COPD to report being asked about tobacco use (95.4% vs 85.8%), advised to quit (87.5% vs 59.4%), assessed for readiness to quit (63.8% vs 37.9%), offered any assistance to quit (58.6% vs 34.0%), and offered follow-up (14.9% vs 5.2%). In adjusted logistic regression models, those with COPD were significantly more likely than those without COPD to receive each of the 5As.

Conclusions: Health professionals should continue to prioritize tobacco cessation counseling and treatment to smokers with COPD. Increased system-level changes and insurance coverage for cessation treatments could be used to improve the delivery of brief tobacco cessation counseling to all smokers, regardless of COPD status.

HOSPITALS' PATTERNS OF USE OF NONINVASIVE VENTILATION IN PATIENTS WITH ASTHMA EXACERBATION

Background: Limited data are available on the use of noninvasive ventilation in patients with asthma exacerbations. The objective of this study was to characterize hospital patterns of noninvasive ventilation use in patients with asthma and to evaluate the association with the use of invasive mechanical ventilation and case fatality rate.

Methods: This cross-sectional study used an electronic medical record dataset, which includes comprehensive pharmacy and laboratory results from 58 hospitals. Data on 13,558 patients admitted from 2009 to 2012 were analyzed. Initial noninvasive ventilation (NIV) or invasive mechanical ventilation (IMV) was defined as the first ventilation method during hospitalization. Hospital-level risk-standardized rates of NIV among all admissions with asthma were calculated by using a hierarchical regression model. Hospitals were grouped into quartiles of NIV to compare the outcomes.

Results: Overall, 90.3% of patients with asthma were not ventilated, 4.0% were ventilated with NIV, and 5.7% were ventilated with IMV. Twenty-two (38%) hospitals did not use NIV for any included admissions. Hospital-level adjusted NIV rates varied considerably (range, 0.4-33.1; median, 5.2%). Hospitals in the highest quartile of NIV did not have lower IMV use (5.4% vs 5.7%), but they did have a small but significantly shorter length of stay. Higher NIV rates were not associated with lower risk-adjusted case fatality rates.

Conclusions: Large variation exists in hospital use of NIV for patients with an acute exacerbation of asthma. Higher hospital rates of NIV use does not seem to be associated with lower IMV rates. These results indicate a need to understand contextual and organizational factors contributing to this variability.

DISTINCT SEVERITY STAGES OF OBSTRUCTIVE SLEEP APNOEA ARE CORRELATED WITH UNIQUE DYSLIPIDAEMIA: LARGE-SCALE OBSERVATIONAL STUDY

Background: Dyslipidaemia is an intermediary exacerbation factor for various diseases but the impact of obstructive sleep apnoea (OSA) on dyslipidaemia remains unclear.

Methods: A total of 3582 subjects with suspected OSA consecutively admitted to our hospital sleep centre were screened and 2983 (2422 with OSA) were included in the Shanghai Sleep Health Study. OSA severity was quantified using the apnoea–hypopnea index (AHI), the oxygen desaturation index and the arousal index. Biochemical indicators and anthropometric data were also collected. The relationship between OSA severity and the risk of dyslipidaemia was evaluated via ordinal logistic regression, restricted cubic spline (RCS) analysis and multivariate linear regressions.

Results: The RCS mapped a nonlinear dose–effect relationship between the risk of dyslipidaemia and OSA severity, and yielded knots of the AHI (9.4, 28.2, 54.4 and 80.2). After integrating the clinical definition and RCS-selected knots, all subjects were regrouped into four AHI severity stages. Following segmented multivariate linear modelling of each stage, distinguishable sets of OSA risk factors were quantified: low-density lipoprotein cholesterol (LDL-C), apolipoprotein E and high-density lipoprotein cholesterol (HDL-C); body mass index and/or waist to hip ratio; and HDL-C, LDL-C and triglycerides were specifically associated with stage I, stages II and III, and stages II–IV with different OSA indices.

Conclusions: Our study revealed the multistage and non-monotonic relationships between OSA and dyslipidaemia and quantified the relationships between OSA severity indexes and distinct risk factors for specific OSA severity stages. Our study suggests that a new interpretive and predictive strategy for dynamic assessment of the risk progression over the clinical course of OSA should be adopted.

USING VENOUS BLOOD GAS ANALYSIS IN THE ASSESSMENT OF COPD EXACERBATIONS: A PROSPECTIVE COHORT STUDY

Introduction: Identifying acute hypercapnic respiratory failure is crucial in the initial management of acute exacerbations of COPD. Guidelines recommend obtaining arterial blood samples but these are more difficult to obtain than venous. We assessed whether blood gas values derived from venous blood could replace arterial at initial assessment.

Methods: Patients requiring hospital treatment for an exacerbation of COPD had paired arterial and venous samples taken. Bland–Altman analyses were performed to assess agreement between arterial and venous pH, CO2 and HCO3. The relationship between SpO2 and SaO2was assessed. The number of attempts and pain scores for each sample were measured.

Results: 234 patients were studied. There was good agreement between arterial and venous measures of pH and HCO3 (mean difference 0.03 and - 0.04, limits of agreement - 0.05 to 0.11 and - 2.90 to 2.82, respectively), and between SaO2 and SpO2 (in patients with an SpO2of >80%). Arterial sampling required more attempts and was more painful than venous (mean pain score 4 (IQR 2–5) and 1 (IQR 0–2), respectively, p<0.001).

Conclusions: Arterial sampling is more difficult and more painful than venous sampling. There is good agreement between pH and HCO3 values derived from venous and arterial blood, and between pulse oximetry and arterial blood gas oxygen saturations. These agreements could allow the initial assessment of COPD exacerbations to be based on venous blood gas analysis and pulse oximetry, simplifying the care pathway and improving the patient experience.

GASTRO-OESOPHAGEAL REFLUX AND WORSE ASTHMA CONTROL IN OBESE CHILDREN: A CASE OF SYMPTOM MISATTRIBUTION?

Background: Obese children for unknown reasons report greater asthma symptoms. Asthma and obesity both independently associate with gastro-oesophageal reflux symptoms (GORS). Determining if obesity affects the link between GORS and asthma will help elucidate the obese-asthma phenotype.

Objective: Extend our previous work to determine the degree of associations between the GORS and asthma phenotype.

Methods: We conducted a cross-sectional study of lean (20%–65% body mass index, BMI) and obese (≥ 95% BMI) children aged 10–17 years old with persistent, early-onset asthma. Participants contributed demographics, GORS and asthma questionnaires and lung function data. We determined associations between weight status, GORS and asthma outcomes using multivariable linear and logistic regression. Findings were replicated in a second well-characterised cohort of asthmatic children.

Results: Obese children had seven times higher odds of reporting multiple GORS (OR=7.7, 95% CI 1.9 to 31.0, interaction p value=.004). Asthma symptoms were closely associated with GORS scores in obese patients (r=0.815, p<0.0001) but not in leans (r=0.291, p=0.200; interaction p value=0.003). Higher GORS scores associated with higher FEV1-per cent predicted (p=0.003), lower airway resistance (R10, p=0.025), improved airway reactance (X10, p=0.005) but significantly worse asthma control (Asthma Control Questionnaire, p=0.007). A significant but weaker association between GORS and asthma symptoms was seen in leans compared with obese in the replicate cohort.

Conclusion: GORS are more likely to associate with asthma symptoms in obese children. Better lung function among children reporting gastro-oesophageal reflux and asthma symptoms suggests that misattribution of GORS to asthma may be a contributing mechanism to excess asthma symptoms in obese children.

LONG-TERM IMPACT OF DEVELOPING A POSTOPERATIVE PULMONARY COMPLICATION AFTER LUNG SURGERY

Introduction: Postoperative pulmonary complications (PPC) such as atelectasis and pneumonia are common following lung resection. PPCs have a significant clinical impact on postoperative morbidity and mortality. We studied the long-term effects of PPCs and sought to identify independent risk factors.

Methods: A prospective observational study involved all patients following lung resection in a regional thoracic centre over 4 years. PPCs were assessed daily in hospital using the Melbourne group scale based on chest X-ray, white cell count, fever, purulent sputum, microbiology, oxygen saturations, physician diagnosis and intensive therapy unit (ITU)/high-dependency unit readmission. Follow-up included hospital length of stay (LOS), 30-day readmissions, and mortality.

Results: 86 of 670 patients (13%) who had undergone a lung resection developed a PPC. Those patients had a significantly longer hospital LOS in days (13, 95% CI 10.5–14.9 vs 6.3, 95% CI 5.9 to 6.7; p<0.001) and higher rates of ITU admissions (28% vs 1.9%; p<0.001) and 30-day hospital readmissions (20.7% vs 11.9%; p<0.05). Significant independent risk factors for development of PPCs were COPD and smoking (p<0.05), not age. Excluding early postoperative deaths, developing a PPC resulted in a significantly reduced overall survival in months (40, 95% CI 34 to 44 vs 46, 95% CI 44 to 47; p=0.006). Those who developed a PPC had a higher rate of non-cancer-related deaths (11% vs 5%; p=0.020). PPC is a significant independent risk factor for late deaths in non-small cell lung cancer patients (HR 2.0, 95% CI 1.9 to 3.2; p=0.006).

Conclusions: Developing a PPC after thoracic surgery is common and is associated with a poorer long-term outcome.