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### **P2.22: THE NEWEST METHOD FOR THE DIAGNOSIS OF PULMONARY ARTERIAL HYPERTENSION**

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## P2.21

## AGREEMENT OF CENTRAL BLOOD PRESSURE MEASURED BY APPLANATION TONOMETRY AND ECHOTRACKING

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**Background:** Some studies have shown the interest of measuring central blood pressure (CBP). Usually measured non-invasively through a function transfer by applanation tonometry (Sphygmocor®) CBP can also be calculated by echotracking (Art.Lab®) at the common carotid artery assuming the fact that the distension waveform is similar to a pressure curve and thus be more precise. However, the agreement between CBP derived from these two devices remains not clear.

**Objectives:** To analyse the agreement between CBP and study the discrepancies between the two techniques.

**Materials and methods:** 74 Patients from Pharmacology Department in Paris and from Surgery, Medical, Molecular, and Critical area pathology Department at Pisa university were matched for age, sex and BP. CBP was estimated by the onboard transfer function of the Sphygmocor® derived from radial measurement. Echotracking measurements were performed on right CCA (ART.LAB) and treated to obtain CBP. Pearson's correlation and Bland&Altman graph were performed for carotid SBP and PP, and multivariate regressions to found the determinants of discrepancies.

**Results:** The correlations between the carotid BP were good (SBP:  $r=0.79$ ; PP:  $r=.77$ ,  $p<0.001$ ). We showed a small overestimation ( $<2$  mmHg) of carotid SBP and PP by echotracking compared to applanation tonometry. Major determinants of discrepancies were center effect and age [ $\beta=13.1(1.8)$ ,  $p<0.001$ ;  $\beta=0.1(0.01)$ ,  $p=0.049$  respectively] for carotid PP and only center [ $\beta=11.8(2.1)$ ,  $p<0.001$ ] for carotid SBP.

**Conclusion:** This study shows a good agreement between the two techniques. Discrepancies could be explained by the differences between the two populations, and the Sphygmocor transfer function and calibration.

## P2.22

## THE NEWEST METHOD FOR THE DIAGNOSIS OF PULMONARY ARTERIAL HYPERTENSION

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**Objectives:** Pulmonary arterial hypertension (PAH) is a devastating lung vascular disease. Despite advances in the diagnosis of this condition, early detection and ascertainment of the genesis of pulmonary hypertension are still a difficult task. We supposed that the method of Single photon emission computed tomography - computed tomography (SPECT/CT) imaging facility is a good alternative in the diagnosis of genesis of pulmonary hypertension, especially in the early period of the disease and in patients with complex differential diagnosis.

**Methods:** We examined 10 people with suspected pulmonary hypertension. Previously, patients underwent right heart catheterization and CT-angiography. Three patients diagnosed with pulmonary hypertension was not confirmed, in four cases was suspected idiopathic pulmonary hypertension and in three cases - pulmonary embolism. After that, seven patients with pulmonary hypertension were performed SPECT / CT with intravenous injection of the radiopharmaceutical 99Tc-MAA (macro-aggregates of albumin).

**Results:** Due to the capabilities of the SPECT / CT to assess perfusion at the level of subsegmental pulmonary artery, the diagnosis of pulmonary embolism was additionally established in two patients from the group with idiopathic pulmonary hypertension. In other cases, the diagnoses were correct.

**Conclusions:** In our data we established, that the using of SPECT / CT has helped us to establish the correct diagnosis that allows us to assign the proper and timely treatment. So, we confirmed our hypothesis, that the modern method of diagnosis of pulmonary hypertension - SPECT / CT - is no less accurate than the standard methods, and is probably preferable in difficult diagnostic cases.

## P2.23

## ASSESSING MYOCARDIAL FUNCTION USING SPECKLE-TRACKING ECHOCARDIOGRAPHY IN AN OLDER POPULATION

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**Background:** Left ventricular systolic dysfunction, an independent predictor of heart failure (HF) and cardiovascular mortality, may be worse in South Asians and African-Caribbeans (than Europeans) as they have more adverse cardiovascular risk factor profiles.

**Objectives:** We sought to investigate ethnic differences in speckle-tracking echocardiography (STE)-derived strain ( $\epsilon$ ) and strain rate (SR) in a community-based cohort of European, South Asian and African-Caribbean older men, and the role of CVD risk factors in accounting for these differences.

**Methods and results:** We recruited 339 men (113 from each ethnic group) with echocardiographic data from the Southall and Brent REvisited (SABRE) cohort, and measured peak systolic longitudinal  $\epsilon$  and SR. Anthropometric, haemodynamic, fasting blood and conventional and tissue Doppler echocardiographic data were also collected. There were no significant differences in peak systolic longitudinal  $\epsilon$  between Europeans (mean $\pm$ SD,  $-17.7\pm 3.1\%$ ), South Asians ( $-16.9\pm 2.9\%$ ) and African-Caribbeans ( $-17.1\pm 3.0\%$ ) ( $p=0.200$ ). Peak systolic longitudinal SR also showed no significant ethnic variation (Europeans:  $-0.50\pm 0.12s^{-1}$ , South Asians:  $-0.48\pm 0.10s^{-1}$ , African-Caribbeans:  $-0.47\pm 0.11s^{-1}$ ,  $p=0.198$ ). Age-adjusted peak systolic longitudinal SR and (tissue Doppler-derived) peak systolic myocardial velocity ( $s'$ ) were compared in subjects with and without hypertension, coronary heart disease (CHD) and diabetes mellitus. Subjects with hypertension and CHD had an attenuated SR and  $s'$  compared to those without, but diabetes mellitus was associated with a lower  $s'$  only. P-values were more significant for  $s'$  than SR.

**Conclusions:** There were no significant ethnic differences in longitudinal  $\epsilon$  & SR. SR could detect myocardial dysfunction in subjects with CHD and hypertension, but was inferior to  $s'$ .

## P2.24

## A COMPARISON OF AORTIC PULSE WAVE VELOCITY MEASURED BY COMPLIOR AND SPHYGMOCOR IN PATIENTS WITH COPD AND HEALTHY VOLUNTEERS

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**Objectives:** A number of non-invasive devices have been used to measure arterial stiffness in COPD. The aim of this study was to compare the Complior device with the gold standard Sphygmocor Vx device, in patients with COPD and healthy volunteers.

**Methods:** Aortic PWV was measured during a single visit in 18 (10 male) patients with COPD and 39 (18 male) healthy volunteers. Using Complior with the intersecting tangent algorithm, PWV was derived using a direct carotid-femoral artery measurement  $\times 0.8$  in 20 subjects, and a subtractive distance (carotid artery to sternal notch and sternal notch to femoral artery) in 37 subjects. All Sphygmocor measurements were calculated using the subtractive distance.

**Results:** Patients and volunteers were similar in gender, mean age 67 years and BMI 26.5kg/m<sup>2</sup>. Using Complior there was no difference in PWV between the direct or subtractive path length in patients or volunteers. Using pooled data, there was no difference in PWV between Complior and Sphygmocor in COPD, and moderate consistency with an intraclass correlation coefficient (ICC) of 0.64. Pooled data for volunteers showed a mean difference in PWV of 1.0 (1.2)m/s ( $p<0.05$ ) but consistency was high ICC 0.92. Bland-Altman plots showed no systematic bias with only one outlier in each group, but greater variability in COPD (Figure 1a&b).

**Conclusion:** There was no difference and moderate consistency in PWV measured by Complior and Sphygmocor in COPD. However in healthy volunteers PWV differed between devices but showed high consistency. Although Complior and Sphygmocor were consistent they should not be used interchangeably.