RESULTS The focus of simulation and training was the logistics optimization and debriefing with strategies to reduce waste of time in the patient's transportation between the various departments, and avoiding excessive reheating during transport between sectors. There was absolute success in the realization of therapeutic hypothermia and validation of the method in real life, with the application of knowledge and logistics in 20 real patient without any delay in the doo-to-balloon time for primary angioplasty, which occurred in a timely manner (less than 90 minutes), and maintenance of therapeutic hypothermia in the ICU successfully.

CONCLUSIONS Simulation was an important tool related to the training and optimization of health professionals skills, and improving the multidisciplinary team to perform therapeutic hypothermia in STEMIs. The use of real scenarios and debriefing were critical to the successful implementation of TH in practice. After simulation and training, the protocol and the method were validated with application of TH in real life successfully and without any delays.

CRT-400.02

The Impact of Patient BMI on Radiation Dose Among Scrub Technologists During Cardiac Catheterization

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BACKGROUND Increasing patient body mass index (BMI) results in greater scatter radiation during fluoroscopy, yet the impact of patient BMI on scrub tech radiation dose during coronary angiography has not been studied.

METHODS Real-time radiation exposure data were prospectively collected during coronary angiography. Scrub tech radiation dose was calculated as $E = 0.02 (H_{os} - H_u) + H_{os}$, where E was effective dose and H_{os} and H_u were outer and inner dosimeter radiation doses, respectively. Patient radiation dose was estimated by dose area product (DAP). Patient BMI was categorized by the NIH classification.

RESULTS In 1,119 consecutive coronary angiography procedures, a significant increase in patient DAP ($p<0.001$) was observed across increasing patient BMI categories. When patient BMI was evaluated as a continuous variable, there was a weak, albeit significant, correlation between patient BMI and scrub technologist effective dose ($r = 0.14$, $p<0.001$). When patient BMI was categorized according to the NIH classification, there was a significant increase in scrub technologist effective dose across increasing patient BMI categories ($p = 0.002$). Compared to BMI <25, a patient BMI of 35-39.9 was associated with 2.7-fold increase in technologist effective dose (0.6 [0.1, 1.6] μSv vs 1.6 [0.4, 4.5] μSv, $p<0.0001$). Compared to BMI <25, a patient BMI ≥40 was associated with 1.8-fold increase in technologist effective dose (0.6[0.1, 1.6] μSv vs. 1.0[0.1, 2.0] μSv), but this difference did not reach statistical significance ($p = 0.120$) likely owing to the smaller sample size of patients with a BMI ≥40.

CONCLUSION During coronary angiography procedures, scrub technologist radiation dose increased significantly with increasing patient BMI. Additional studies are needed to improve scrub technologist radiation safety practices when performing coronary angiography in obese patients.

SCIENCE

ATHEROSCLEROSIS

CRT-500.01

Relationship Between Monocyte Subsets, Il-6 and Hs-crp with the Severity of Coronary Artery Disease in Stable Angina Pectoris Patients

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BACKGROUND Monocytes are crucially involved in all stages of atherogenesis as cellular drivers of vascular inflammation hallmarking atherosclerotic disease.$CD16^+$monocytes are pro-inflammatory cells, whose proportion is related to the occurrence of coronary artery disease (CAD), intma-media thickness and plaque stability. Interleukin-6 (IL-6) and highly sensitive C reactive protein (hs-CRP) were also closely related to atherosclerotic disease.

OBJECTIVE We investigated the relationship between the monocyte subsets, IL-6,and hs-CRP with the severity of CAD assessed by coronary angiography (CAG) in patients with stable angina pectoris (SAP) through their correlation with Gensini score.

METHODS Our study included 45 SAP patients who underwent diagnostic CAG. Thirty two patients of them who diagnosed as CADwere subdivided into 2 groups: 17 patients with multiple-vessel disease (MVD) and 15 patients with single-vessel disease (SVD). The rest thirteen SAPpatients without CAD (non-CAD) were considered as a comparative group. Gensini score was used to assess the severity of CAD. Monocyte subsets were analyzed by flow cytometry and serum levels of IL-6 and hs-CRP were measured by ELISA.

RESULTS The relative proportion of $CD14^+$ $CD16^+$ and $CD14^{bright}CD16^+$ was significantly higher in CAD patients, MVD and SVD as compared with non-CAD patients and in MVD more than SVD. Serum levels of IL-6 and hs-CRP were significantly increased in CAD patients, MVD and SVD when compared with non-CAD patients, but no significant difference between MVD and SVD. The proportion of $CD14^+CD16^+$and $CD14^{bright}CD16^+$ monocytes was positively correlated with Gensini score ($r=0.667$, $P =0.000$, $r=0.695$, $P=0.000$).

CONCLUSIONS Elevated proportion of $CD14^+$ $CD16^+$ monocytes subsets was associated with the severity of CAD in patients with SAP.

CRT-500.04

Lower Wall Shear Stress and Clinical Risk Factors are Associated with Endothelial Dysfunction in Patients with Non-Obstructive Coronary Artery Disease

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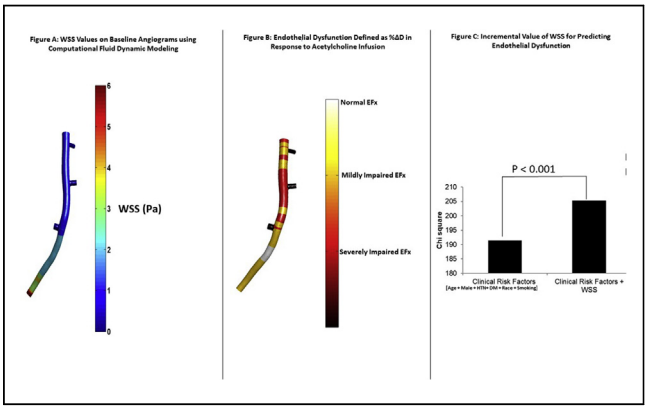
BACKGROUND We hypothesized that wall shear stress (WSS) has incremental value over cardiovascular risk factors for predicting severe endothelial dysfunction (EDFx) in patients with non-obstructive coronary artery disease (CAD).

METHOD WSS was calculated in each 0.5 mm thick coronary segment in 44 patients with CAD by performing 3-D geometric reconstruction of baseline angiograms and computational fluid dynamics (Fig A). Low WSS was defined as <1 Pascal (Pa). Severe EDFx was defined as ≤-10% change in lumen diameter (%ΔD) in response to acetylcholine (ACh) infusion in each segment (Fig B).

RESULTS Mean age was 51.2 ± 12.5 years, 73% were female and mean diameter stenosis was 20 ± 12%. In 4,510 segments analyzed, median WSS was 3.7 [IQR: 2.3 to 5.5] Pa and 1065 (24%) segments had severe EDFx. In univariable analysis, lower WSS (OR: 0.81, $p < 0.001$), older age (OR: 1.023; $p < 0.001$), female sex (OR: 2.39; $p < 0.001$), hypertension (OR: 1.43; $p < 0.001$) and smokers (OR: 1.37; $p < 0.001$) were associated with severe EDFx. In a multivariable logistic regression model, lower WSS (OR: 0.85; $p < 0.001$) was associated with severe EDFx independent of clinical risk factors. Addition of WSS to clinical risk factors resulted in a significant increase in global χ^2 for a model predicting severe EDFx ($p < 0.001$) (Fig C). Similarly, in a multivariable linear regression model, a greater number of segments with low WSS (Beta: -0.13, $p < 0.001$) were independently associated with greater vasoconstriction (%ΔD) in response to ACh.

CONCLUSION Among patients with non-obstructive CAD, lower WSS and greater area of low WSS were independently associated with severe endothelial dysfunction. Low WSS had an incremental value over clinical risk factors for predicting severe endothelial dysfunction.



OTHER

CRT-500.06

Related Variables in the Screening for Prevalence of Prehypertension in Young Adults Students at Technical School

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BACKGROUND Worldwide, several studies have been conducted about the association between hypertension in childhood and adolescence and socio-demographic factors: lifestyle, family history and anthropometry.

OBJECTIVE This study aims to identify the prevalence of prehypertension and related variables in young adults.

METHODS Cohort study. The variables were collected by questionnaire or measures. Univariate analysis was performed using the chi square and it was performed five multiple logistic regression models for the variables with $p < 0.10$ in the univariate analysis. The students were from three courses, either college as vocational school, were evaluated: gender, age, course, skin color, income, education, lifestyle, history of hypertension, weight, waist circumference and prehypertension defined as VII Joint National Committee: systolic 120-139 and diastolic 80-89 mmHg.

RESULTS A total of 394 students were evaluated. There were 309 (78,43%) in the normal group (NG) and 85 (21,57%) in prehypertension group (PH) of students. It was found in NG and PG, respectively: females 254 (82.2%) and 44 (51.8%) ($p < 0.001$); age (three age ranges: until 19 years, 20-25 and 25-30) more frequent in older ($p = 0.001$); ethnicity (self declared) black 16 (5.2%) and 11 (12.9%) ($p < 0.001$); 62 mother's hypertension (20.1%) and 28 (32.9%) ($p = 0.024$); overweight 34 (11.0%) and 17 (20.0%) ($p = 0.045$); obese 3 (1.0%) and 10 (11.8%) ($p < 0.001$); increased abdominal circumference 37 (12.0%) and 19 (22.3%) ($p = 0.024$). At least one offive multiple logistic regression models were associated with absence or presence of prehypertension (OR, 95% CI): females (4,026, 2.373 to 6.828), age (1.081, 1.004 to 1.164), hypertensive mother (1.838, 1.027 to 3.289) and greater waist circumference (1.067, 1.035 to 1.100).

CONCLUSION About a fifth of the students were considered to be in prehypertension group. Factors associated with prehypertension this study: male, older, mother with hypertension and increased waist circumference.

CRT-500.07

The Role of Small Nerve Fibers in the Development of Atrial Fibrillation

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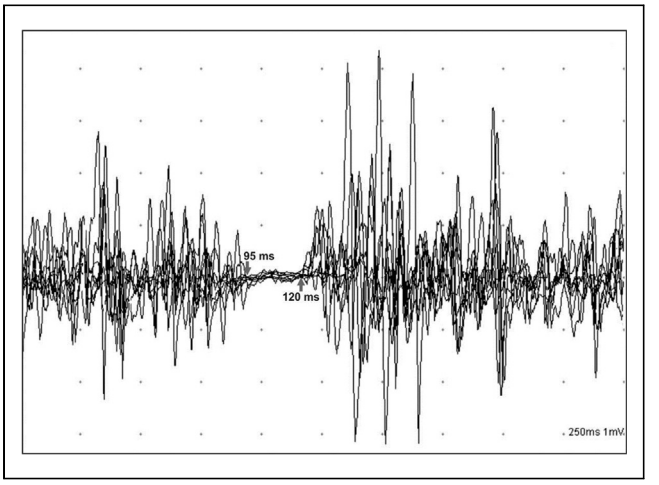
BACKGROUND Atrial fibrillation is (AF) the most common sustained cardiac rhythm disorder. Small nerve fibres carry autonomic modalities, somatic pain and temperature sensations. The aim of our study was to assess the role of small A-delta nerve fibres in the peripheral nerves of patients with AF.

METHODS The function of small nerve fibers was assessed by cutaneous silent period (CSP) elicited by electrical square pulse stimulation using stimulating ring electrodes on the index finger and recording electrodes over thenar musles. The CSP onset, end latencies and suppression of muscle activity - duration over APB were measured. Patients either with polyneuropathy or drugs that contribute to peripheral nerve involvement were excluded.

RESULTS In the study 30 patients with paroxysmal AF and 30 aged-matched healthy subjects were comprised. The mean CSP onset latency in patients with AF was significantly longer compared with the control group (86.67 ± 8.19 vs. 68.05 ± 7.81, CI 83.2-90.1 vs. 65.9-70.0), meanwhile CSP duration was markedly shorter in AF patients (45.10 ± 10.96 vs. 60.95 ± 10.14, CI 40.7-49.6 vs. 58.3-63.4). Nerve conduction study of the large motor and sensory fibers did not reveal any difference between patients and healthy subjects.

Fig. 1 Cutaneous silent period in patient with AF

CONCLUSION In our study, the main attention was focused on the extrinsic cardiac nervous system using a CSP measurement. The delay of CSP onset latency reflects the impairment of afferent volley of A-delta afferents, efferent motor axons and synaptic delay, while shortened CSP duration is related to the amount of activated axons and indicates the axonal lesion. Abnormality of CSP in AF patients supports the occurrence of small nerve fiber neuropathy. Our study of small nerve fibres may implay a new aspect in the etiology of AF.



CRT-500.09

Reliability of The Cardiac Output Measurements During Catheterization: Comparison of Various Commonly Used Formulae Calculating Assumed O_2 Consumption

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BACKGROUND Cardiac output (CO) measurement guides management of various medical conditions, including adult congenital heart diseases (ACHD) and pulmonary hypertension. It is mandatory to calculate patients' oxygen consumption (VO_2), to measure CO. Ideally VO_2 consumption should be measured by using a metabolic apparatus;

SCIENCE