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 $20 \pm 12\%$. 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.