Coronary artery flow velocity alteration by transthoracic echo in a group of young adult males

Authors:
O Sukhanova¹, A Zagatina¹, N Zhuravskaya¹, AV Ivanov¹, D Shmatov¹, ¹Saint Petersburg State University - Saint Petersburg - Russian Federation,

Topic(s):
Imaging: Prevention and Rehabilitation

Citation:

Background. Atherosclerosis is a chronic and progressive disease that causes high mortality primarily in persons over the age of forty. However, a lot of atherosclerosis cases are only discovered after a fatal cardiovascular event. Several techniques can be used to identify atherosclerosis when it is still in its subclinical stages and at ages before the symptoms of atherosclerosis became marked. The SCORE chart and other scores were developed for this purpose. However, the SCORE chart doesn’t cover the people under 40 years old. A significant portion of patients with a high risk of cardiovascular disease have major cardiac events before reaching 40 years of age. The aim of the study was to define subclinical coronary flow alteration in apparently healthy men between the ages of 30-39.

Methods. This is part of a study intended to facilitate risk estimation in apparently healthy persons between 30 and 39 years old with no documented cardiovascular disease. Seventy-two consecutive men (34±3 years old) who were assumed healthy, were recruited into the study. A standard cardiology exam; analysis of blood lipids; basic transthoracic echocardiography examination with additional scans of the left main, left anterior descending, and circumflex arteries; and carotid ultrasound were performed.

Results. Among the study population there were eight obese patients (12.5%), twenty-two (22%) smokers, forty-eight (66%) had dyslipidaemias, and six (8%) had a first-degree relative with known premature coronary or vascular events. All of them had a normal ejection fraction (65±4%) and heart chamber sizes. The mean global longitudinal strain (GLS) was -19.3±2%, myocardial mass index was 77±12 g/m², and intima-media thickness (IMT) was 0.74±0.19 mm.

Intima-media thickening at standard site was found in twelve patients (17%, 95% CI 9-26%), atherosclerosis with pronounced plaques in carotid arteries was diagnosed in twenty-one man (29%, 95% CI 19-40%). The group with atherosclerotic plaques had a higher maximal velocity in coronary arteries (44±16 vs. 33±11 cm/s, p<0.002) compared to other patients. Ejection fraction (65±5 vs. 65±4 %, p=0.93), myocardial mass index (81±13 vs. 75±12, g/m² p=0.053), and GLS (-19±3 vs. -19±2 %, p=0.55) were similar. There was a significant correlation between IMT and maximal velocity in coronary arteries (r=-0.44, p<0.0005). Three patients of atherosclerotic group (14%, 95% CI 3-32%) had coronary flow velocity more than 68 cm/s corresponding significant coronary artery lesions.

Conclusion: There is a high prevalence of subclinical atherosclerosis among men between the ages of 30 and 39 in a population with a high risk of cardiovascular disease by SCORE chart. Coronary flow velocity assessment could be helpful for detection of coronary lesions in young adult patients with carotid plaques.