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Thesis Title	**ASSESSMENT OF ENDOTHELIAL FUNCTION BY NON INVASIVE INVESTIGATIONS IN CORONARY ARTERY DISEASE**			
Year	**2015**			
Abstract	**Arterial endothelial dysfunction is one of the key early events in atherogenesis, even preceding the structural atherosclerotic changes that might developed in systemic arteries. However, endothelial function can be assessed through flow mediated dilatation of brachial artery using an ultrasound-based method (Doppler) before and after the shear stress test which causes endothelium-dependent dilatation induced by endothelial Nitric Oxide release.** **Thus, flow mediated dilatation of brachial artery; the noninvasive endothelial function testing has provided valuable insights into an early atherogenesis and constitutes a helpful test in the detection of coronary atherosclerosis when compared with that of invasive testing of coronary endothelial function. On the other hand, an impairment of flow mediated dilatation in Brachial artery is related to the presence and / or extent and severity of Coronary Artery Disease. While, arterial stiffness index (SI) is widely used as a very sensitive indicator of endothelial dysfunction , arterial intima media thickness which reflects the structural vascular damage is established as a marker of atherosclerosis and has been associated with both incident and prevalent cardiovascular disease. This study was designed to :(1) Assess the role of flow mediated dilatation of brachial artery as a marker of systemic endothelial function,(2)Correlate between flow mediated dilatation of brachial artery with the presence, extent and severity of Coronary Artery Disease (CAD),(3)Find out the association between stiffness index (functional vascular damage) and intima media thickness (structural vascular damage) with the severity and extent of CAD,** **(4)Evaluate the effect of body mass index, waist to hip ratio and lipid profile on vascular endothelium.** **Sixty nine (69) patients with chest pain of either sex (46males, 23 females), in addition to 31 control subjects (15males, 16 females) with**			

	negative coronary CT angiography findings, all with an age range of (40-65years) were involved in this study. In addition to Demographic data and physical measurements, each subject was submitted to medical history, clinical examination, estimation of lipid profile, shear stress test, high-resolution external vascular Doppler ultrasound for brachial and carotid arteries (FMD%, stiffness index, intima media thickness), in addition to the computed tomography angiography (CT) scanning for the coronaries. The shear stress test involves occlusion of brachial artery in the upper arm for 5 minutes using a pressure cuff inducing reactive hyperemia after the cuff is released. However, this study was carried out in the Radiology Department at Al-Yarmook Teaching Hospital, Baghdad from October 2013 till March 2015. According to the coronary CT angiographic findings, patients were classified into three groups: single coronary lesion (SCL), multiple coronary lesion (MCL) and control groups. The results revealed that the FMD% in patients groups (SCL, MCL) is significantly lower than that of control group(P≤0.001, P≤0.01) respectively and it is inversely correlated with percentage of coronary artery stenosis in SCL group (P≤0.01, r=0.433) and with that of SI of both brachial and carotid arteries in both SCL, MCL groups, while a significant difference in SI is noticed between the MCL group and that of control regarding the carotid artery (P≤0.05). A positive statistical correlation is observed between the SI of brachial and carotid **arteries among the studied groups, whereas a significant positive statistical correlation is found between the SI of carotid, brachial arteries with the percentage of coronary artery stenosis in SCL group (P≤0.05). Arterial IMT are significantly higher in MCL when compared with SCL (P≤0.0s) which is again significantly higher than control (P≤0.001). A positive correlation is observed between the arterial IMT with the percentage of coronary artery stenosis in SCL group(P≤0.05). Left anterior descending artery showed higher frequency of involvement by atheromatous stenosis (47%) when compared with that of Left main artery with a fequency of (13.72%). However, in MCL group, there was a higher frequency among males (88%) in respect to females (12%).** **In conclusion, the data of this study revealed that FMD is a useful, non invasive test for the assessment of vascular endothelial dysfunction. Arterial SI which reflects functional vascular damage is a good indicator of coronary artery disease. In addition, arterial intima media thickness can be used as a screening tool for coronary artery disease as it is sensitive indicator of structural vascular damage.**