*Modern American Journal of Medical and Health Sciences*
**ISSN (E):** 3067-803X
Volume 01, Issue 03, June, 2025
**Website:** usajournals.org


# INTIMA-MEDIA THICKNESS OF COMMON AND SUPERFICIAL FEMORAL ARTERIES AS A MARKER OF CORONARY ATHEROSCLEROSIS IN PATIENTS WITH ISCHEMIC HEART DISEASE

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**Abstract**
This study investigated the relationship between intima-media thickness (IMT) of the common and superficial femoral arteries and the severity of coronary atherosclerosis in patients with ischemic heart disease (IHD). A total of 80 patients aged 40–70 years participated in the study. IMT was assessed by ultrasonography, while the degree of coronary artery stenosis was evaluated via invasive angiography. Results demonstrated a statistically significant association between the mean IMT (IMTmean) of the common femoral artery and the severity of coronary stenosis, confirming the diagnostic value of femoral artery IMT. An IMTmean ≥0.83 mm predicted ≥50% coronary stenosis with a sensitivity of 72.1% and specificity of 61.1%.

**Keywords:** Ischemic heart disease, intima-media thickness, femoral arteries, coronary atherosclerosis, ultrasound diagnostics, SYNTAX score, ROC analysis.

## Introduction

In recent years, intima-media thickness has emerged as a widely studied marker for the early assessment of cardiovascular diseases. However, according to the 2019 ESC and 2013 AHA clinical guidelines, carotid IMT is no longer recommended for cardiovascular risk assessment due to the lack of methodological standardization and inconsistent clinical trial outcomes. Morphological differences between carotid IMT and atherosclerotic plaques,

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limited reproducibility, and declining interest in the method have contributed to this shift.

Conversely, femoral artery IMT is gaining relevance due to its strong correlation with cardiovascular risk factors and coronary atherosclerosis, as well as its superior reliability in repeated measurements. According to D. Kocyigit et al., a femoral IMT >0.85 mm predicts cardiovascular events with 70% sensitivity and 67.8% specificity.

## Objective

To determine the correlation between mean IMT values of the common and superficial femoral arteries and the severity of coronary atherosclerosis, and to assess the diagnostic value of femoral artery IMT in identifying ≥50% coronary artery stenosis.

## Materials and Methods

Study Participants

The study included 80 patients aged 40–70 years with a confirmed diagnosis of stable IHD based on the following criteria:

- Myocardial infarction (confirmed via laboratory markers);
- Positive exercise stress test;
- Perfusion defects on myocardial scintigraphy.

Exclusion criteria: Liver failure, GFR <30 ml/min/1.73 m², malignancies, psychiatric illness, substance abuse, and chronic inflammatory diseases.

Ethics: Written informed consent was obtained from all participants.

Biochemical Analysis

Fasting blood samples were analyzed for total cholesterol, LDL, HDL, triglycerides, glycated hemoglobin, creatinine, and high-sensitivity C-reactive protein (hs-CRP).

Ultrasound Examination

B-mode, color Doppler, and power Doppler imaging of the femoral, carotid, and other arteries were performed using a Samsung Medison EKO7 ultrasound

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system. IMT was measured in plaque-free regions along the posterior arterial wall over a 1 cm segment.

Coronary Angiography

Coronary angiography was conducted using the Innova 3100 system. Coronary atherosclerosis severity was scored using the SYNTAX system.

Statistical Analysis

Statistical analysis was performed using IBM SPSS Statistics 18. Diagnostic performance was assessed using ROC analysis (AUC and 95% confidence intervals).

## Results

Among the 80 patients:

- 51.2% had a history of myocardial infarction;
- 47.5% had undergone coronary revascularization;
- Over 80% were on statins and antiplatelet therapy;
- Only 18.7% achieved LDL <1.5 mmol/L.

Correlation of IMT with Coronary Atherosclerosis:

- Mean IMT of the common femoral artery showed a significant positive correlation with SYNTAX score ($p<0.05$);
- Superficial femoral artery IMT was also correlated, while no significant association was found with carotid IMT;
- ROC analysis showed that a common femoral IMT ≥0.83 mm predicted ≥50% coronary stenosis with 72.1% sensitivity and 61.1% specificity (AUC reported).

## Discussion

Non-invasive assessment of carotid arteries has been a traditional approach for evaluating subclinical and systemic atherosclerosis. However, recent studies suggest that atherosclerosis in lower extremity arteries—particularly femoral arteries—may have a stronger correlation with coronary artery status and serve as a more reliable prognostic marker.

Our findings demonstrate a clear association between common femoral artery IMTmean and coronary atherosclerosis severity, consistent with the results of M.

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Kirchmajer et al., who reported a direct relationship between femoral IMTmean and coronary lesions scored by the Gensini system in IHD patients.

We also observed a correlation between superficial femoral IMTmean and coronary stenosis, while carotid IMT showed no significant association. Literature reports inconsistent findings regarding carotid IMT. For example, a meta-analysis of 22 clinical studies found that a carotid IMT ≥1 mm predicted IHD with 66% sensitivity and 79% specificity, whereas S. Saedi et al. reported no significant association between carotid IMT and SYNTAX score.

Moreover, our study showed that the diagnostic value of femoral artery IMTmean in detecting ≥50% coronary stenosis was superior to that of carotid and superficial femoral arteries. Previously, N. Okumura et al. confirmed the predictive power of femoral IMTmean for lower extremity atherosclerosis but reported limited diagnostic value for carotid IMTmean in this context.

Several explanations have been proposed for the superior diagnostic and prognostic value of femoral IMT. Some studies suggest that femoral IMT is more responsive to overall cardiovascular risk factors, particularly LDL cholesterol levels. Additionally, femoral IMT may be more influenced by modifiable environmental factors and less affected by age compared to carotid IMT.

Chronic inflammation may also play a role. Literature reports increased carotid IMT in various chronic inflammatory conditions. The PESA study used 18F-FDG PET/MRI to assess vascular inflammation, finding a higher prevalence in femoral arteries (24.4%) compared to carotids (15.8%). Atherosclerotic plaques were more frequent in the iliofemoral segment than in carotids, indicating that IMT increases in the lower limbs may more likely reflect atherosclerosis than smooth muscle hypertrophy.

## Conclusion

In patients with ischemic heart disease, the mean IMT of the common and superficial femoral arteries is associated with the severity of coronary atherosclerosis. A common femoral IMTmean ≥0.83 mm may predict ≥50% coronary artery stenosis and demonstrates higher diagnostic value compared to carotid IMT.

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**References:**

[1] S Mach F, Baigent C, Catapano AL, et al. 2019 ESC/EAS Guidelines for the management of dyslipidaemias: lipid modification to reduce cardiovascular risk. Eur Heart J 2020;41(1):111-88.

[2] Goff DC, Lloyd-Jones DM, Bennett G, et al. 2013 ACC/AHA guideline on the assessment of cardiovascular risk: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Circulation 2014;129:49-73.

[3] Näslund U, Lundgren A, Vanoli D, Norberg M. Is intima-media thickness a predictor for cardiovascular risk? Lancet 2019;394(10196):381.

[4] Saba L, Jamthikar A, Gupta D, et al. Global perspective on carotid intima-media thickness and plaque: should the current measurement guidelines be revisited? Int Angiol 2019; 38(6):451-65.

[5] Lilje C, Cronan JC, Schwartzenburg EJ, et al. Intima-media thickness at different arterial segments in pediatric type 1 diabetes patients and its relationship with advanced glycation end products. Pediatr Diabetes 2018;19(3):450–6.

[6] Prati C, Demougeot C, Guillot X, et al. Vascular involvement in axial spondyloarthropathies. Joint Bone Spine 2019;86(2):159–63.

[7] Layne AJ, Fairman RM, Jackson BM, et al. Analysis of femoral artery intimamedia thickness during the cardiac cycle. J Surg Res 2012;177(2):382-6.

[8] Jeremi s Z, Mak K, Bogdan A, et al. Femoral intima-media thickness, risk factors, and markers of inflammation in cardiovascular disease. J Interdiscipl Med 2018;3(3):141-51.

[9] Soneye MA, Adekanmi AJ, Obajimi MO, Aje A. Intima-media thickness of femoral arteries and carotids among an adult hypertensive Nigerian population: A casecontrol study to assess their use as surrogate markers of atherosclerosis. Ann Afr Med 2019;18(3):158-66.