

controls (6.3 [2] vs. 3.9 [1.9] ng/mg Cholesterol; $p = 0.004$). 24S-HC and 27-HC levels were respectively five and 20-fold higher in the arterial tissue of PAD individuals than in those of the controls ($p = 0.016$ and $p = 0.001$). Plasma C-reactive protein correlated with plasma 24S-HC ($r = 0.51$; $p = 0.010$), 25-HC ($r = 0.75$; $p < 0.001$), 27-HC ($r = 0.48$; $p = 0.015$), and with tissue 24S-HC ($r = 0.40$; $p = 0.041$) and 27-HC ($r = 0.46$; $p = 0.023$). Conclusion: The accumulation in the arterial intima of oxysterols originated enzymatically, and not by the action of free radicals, is associated with the severity of atherosclerotic disease and of the systemic inflammatory activity in individuals with severe PAD.

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HDL size is more accurate than HDL cholesterol to predict carotid subclinical atherosclerosis in individuals classified as low cardiovascular risk

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Background: Misclassification of patients as low cardiovascular risk (LCR) remains a major concern and challenges the efficacy of traditional risk markers. Due to its strong association with cholesterol acceptor capacity, high-density lipoprotein (HDL) size has been appointed as a potential risk marker. Hence, we investigate whether HDL size improves the predictive value of HDL-cholesterol in the identification of carotid atherosclerotic burden in individuals stratified to be at LCR. **Methods:** 284 individuals (40–75 years) classified as LCR by the current US guidelines were selected in a three-step procedure from primary care centers of the cities of Campinas and Americana, SP, Brazil. Apolipoprotein B-containing lipoproteins were precipitated by polyethylene glycol and HDL size was measured by dynamic light scattering (DLS) technique. Participants were classified in tertiles of HDL size (<7.57 ; 7.57 – 8.22 ; >8.22 nm). Carotid intima-media thickness (cIMT) <0.90 mm (80th percentile) was determined by high resolution ultrasonography and multivariate ordinal regression models were used to assess the association between cIMT across HDL size and levels of lipid parameters. **Results:** HDL-cholesterol was not associated with cIMT. In contrast, HDL size >8.22 nm was independently associated with low cIMT in either unadjusted and adjusted models for age, gender and Homeostasis Model Assessment 2 index for insulin sensitivity, ethnicity and body mass index (odds ratio 0.23; 95% confidence interval 0.07–0.74, $p = 0.013$). **Conclusion:** The mean HDL size estimated with DLS constitutes a better predictor for subclinical carotid atherosclerosis than the conventional measurements of plasma HDL-cholesterol in individuals classified as LCR.

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Green synthesis of gold nanoparticles with aminolevulinic acid of: A novel theranostic agent for atherosclerosis

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Introduction: In this study, ALA gold nanoparticles (ALA:AuNPs) functionalized with polyethylene glycol (PEG) were synthesized and administered to rabbits to evaluate its use in clinical practice as theranostic agent for atherosclerosis. This was done by measuring the porphyrin fluorescence extracted for the rabbit's blood and feces. An increase in the blood and feces porphyrin emission after ALA:AuNPs administration suggests that ALA was incorporated by the gold nanoparticles, its structure was preserved, and a rapid conversion into endogenous porphyrins occurred, overloading the synthetic pathway that lead to the PPIX accumulation. **Results:** The results show that the functionalized gold nanoparticles reached atheromatous plaques and its ALA was converted to PPIX. The selective accumulation of PPIX in plaques provides a contrast between control animals and those with atherosclerosis. **Conclusions:** An increase in the blood and feces porphyrin emission after ALA:AuNPs administration suggests that ALA was incorporated by the gold nanoparticles, its structure was preserved, and a rapid conversion into endogenous porphyrins occurred, overloading the synthetic pathway that lead to the PPIX accumulation. The high accumulation of PPIX in tissues is thought to be the result of uncontrolled cell proliferation that accompanied the growth of atheromatous plaques. This finding indicated that ALA:AuNPs can aid in the early diagnosis and therapy of atherosclerosis with high sensitivity.

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High-density lipoprotein (HDL) phospholipid content and cholesterol efflux capacity are reduced in patients with low HDL-cholesterol and subclinical atherosclerosis

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Introduction: Low HDL-cholesterol (hypoalphalipoproteinemia) is considered an independent risk factor for atherosclerosis. This inverse relationship has been attributed to different protective properties, such as cholesterol efflux, inhibition of platelet aggregation, and their antioxidant and anti-inflammatory activities. Thus, we explored the association between functions of HDL in patients free of cardiovascular disease and hypoalphalipoproteinemia or atherosclerotic burden. **Methods:** Study participants were classified according to their plasma HDL-cholesterol levels: below the 10th percentile, a group with low HDL-C (LH; ≤ 32 mg/dL; $n = 33$), between percentiles 40 and 60, intermediate group (IH; 40 – 67 mg/d; $n = 33$) or above the 90th percentile, a group with high levels of HDL-C (HH; ≥ 78 mg/d; $n = 35$). The chemical composition of HDL, particle size, cholesterol efflux capacity, antioxidant activity, susceptibility to oxidation, anti-inflammatory activity and ability to inhibit platelet aggregation were measured in 101 patients. Intima-media thickness of the carotid arteries (CIMT) was determined by high-resolution ultrasonography. **Results:** The LH group was associated with increased CIMT (0.72 ± 0.3 vs. 0.61 ± 0.20 in IH and 0.65 ± 0.15 in HH; $p \leq 0.001$), increased HDL-triglyceride ($4 \pm 2\%$ vs. $4 \pm 2\%$ in IH and $3 \pm 1\%$ in HH, $p \leq 0.001$), reduced HDL-phospholipid ($12 \pm 4\%$ vs $14 \pm 5\%$ in IH and $13 \pm 3\%$ HH, $p = 0.035$), reduced size of HDL particle (7.33 ± 0.33 nm vs. 7.72 ± 0.45 nm in IH, and 8.49 ± 0.42 nm in HH, $p \leq 0.001$), and reduced cholesterol efflux capacity ($9 \pm 3\%$ vs. $12 \pm 3\%$ in IH and $11 \pm 4\%$ in HH, $p \leq 0.001$). CIMT >1 mm was associated with reduced HDL size (7.55 ± 0.49 nm vs. 7.89 ± 0.64 nm, $p \leq 0.001$), antioxidant activity (37 (23)% vs 49 (42)%, $p = 0.018$), and reduced cholesterol efflux