JACC: Spanish scientists provide the first demonstration that triglycerides are a primary risk factor in atherosclerosis

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A study published in JACC shows that excess circulating triglyceride concentrations are associated with subclinical atherosclerosis and vascular inflammation in individuals with low-to-moderate cardiovascular risk according to standard scores

Triglycerides can be as important an indicator of cardiovascular risk as high cholesterol. A study conducted by researchers at the *Centro Nacional de Investigaciones Cardiovasculares* (CNIC) shows for the first time that hypertriglyceridemia (excess circulating triglycerides) is associated with subclinical atherosclerosis (an accumulation of fats, cholesterol, and other substances within and on the surface of arteries, leading to restricted blood flow) and vascular inflammation in individuals with low-to-moderate cardiovascular risk, even if they have normal circulating concentrations of LDL-C, known as 'bad' cholesterol. The results are published in *The Journal of American College of Cardiology* (JACC).

Until now, triglycerides have been considered a secondary factor in the origin of atherosclerosis, far less important than cholesterol, especially cholesterol bound to low-density lipoproteins (LDL). Indeed, "if LDL-C concentrations are normal, current cardiovascular prevention guidelines do not recommend treatment for high circulating triglyceride concentrations unless the patient has a high cardiovascular risk," said study first author Dr. Sergio Raposeiras-Roubin.

The new study provides the first demonstration that "in individuals with a low-to-moderate cardiovascular risk according to standard scores (the majority of the population), high circulating levels of triglycerides are associated with a greater risk of developing atherosclerosis, even among people with normal LDL-C."

The study indicates that clinical practice guidelines should be modified to emphasize the need to control not only LDL-cholesterol but also triglyceride levels

Describing the research, Raposeiras-Roubin explained that the team “analyzed the association between triglyceride levels and the presence of silent atherosclerotic plaques in different vascular territories in participants in the PESA study. The results revealed a very strong association. These silent plaques have not yet produced any cardiovascular events, making them in principle amenable to interventions to prevent disease progression.”

The new study forms part of the PESA CNIC-SANTANDER study (Progression and Early detection of Subclinical Atherosclerosis), a major long-term project run by the CNIC in partnership with Santander Bank. The PESA CNIC-SANTANDER study examines the development of atherosclerotic plaques in three arterial territories—the carotids, the abdominal aorta, and the iliofemoral arteries—in an asymptomatic population of Santander Bank employees between the ages of 40 and 54 years. The study, led by CNIC General Director Dr. Valentín Fuster, has demonstrated the high prevalence of subclinical atherosclerosis in the general population, establishing the importance of detecting the disease early in its silent phase.

Moreover, **the new JACC article shows that triglyceride levels are associated not only with the presence of atherosclerosis**, but also with vascular inflammation.

CNIC Clinical Research Director Dr. Borja Ibáñez explained that this result indicates a strong association between elevated circulating triglyceride levels and the early stages of atherosclerosis, a finding “with important implications for the design of preventive strategies.”

The research team found that the risk of atherosclerosis increased markedly when blood triglyceride concentrations exceeded 150 mg/dL. It therefore “**seems reasonable to advise people about appropriate dietary and other lifestyle measures that can help to keep the triglyceride concentration below this threshold**,” added Dr. Ibáñez.

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The results indicate that clinical practice guidelines should be modified to emphasize the need to control not only LDL-cholesterol but also triglyceride levels. “The measurement of blood triglycerides is routine, and fortunately there are abundant effective medicines available to ensure appropriate levels,” concluded Dr. Fuster.

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- *Raposeiras-Roubin S, Rosselló X, Oliva B, Fernández-Friera L, Mendiguren JM, Andrés V, Bueno H, Sanz J, Martínez de Vega V, Abu-Assi E, Iñiguez A, Fernández-Ortiz A, Ibáñez B, Fuster V. (2021). Triglycerides and Residual Atherosclerotic Risk. J Am Coll Cardiol, 77(24), 3031-3041. doi: 10.1016/j.jacc.2021.04.059*

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