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EDITORIAL

Atherogenic risk assessment - Can we improve it?

Valoración del riesgo aterogénico. ¿Lo podemos mejorar?

José Puzo Foncillas[a,b]

[a] *Unidad de Lípidos, Servicio de Análisis y Bioquímica Clínica, Hospital Universitario San Jorge de Huesca, Spain*
[b] *Instituto de Investigación Sanitaria Aragón (IIS Aragón), Departamento Medicina, Universidad de Zaragoza, Spain*

Close examination of the real risk of suffering cardiovascular disease in the future is of great help for preventive medicine. The research and advances carried out in this field are of extraordinary importance, because through risk assessment, appropriate and proportionate therapeutic measures can be provided for the patient.

Since the publication of the so-called Castelli index, numerous lipid ratios or ätherogenic indiceshave been introduced to try to increase the predictive capacity of lipid and apolipoprotein measurements: TC/HDL-C, LDL-C/HDL-C, NO-C -HDL (TC minus C-HDL), C-non-HDL/C-HDL, Apo A-I/ Apo B-100. All of them, in various studies, seem to be good predictors of cardiovascular disease (CVD). The plasma atherogenic index (PAI), calculated according to the formula, log(TG/HDL-C)3, reflects the relationship between protective and pro-atherogenic lipoproteins and stands out as a strong predictor of arteriosclerosis and coronary heart disease.[1]

The genetic variation of this and other atherogenic indices has recently been classified.[2]

Fabregat-Andrés et al carried out an interesting study that evaluates a simple atherogenic index: CRP*100/HDL and its association with carotid endothelial anomalies related to atherosclerosis.[3]

E-mail address: jpuzo@unizar.es

Atherosclerosis is the common pathological basis of acute coronary syndrome (ACS). It is associated, among other pathogenic mechanisms, with endothelial dysfunction, inflammation, dyslipidaemia, foam cell formation and platelet activation. Chronic inflammation plays a fundamental role in mediating arteriosclerosis, from initiation and progression to plaque rupture. This chronic low-grade systemic inflammation is the basis of the pathogenesis of most age-related diseases, including hypertension and atherosclerosis.

Furthermore, disorders of lipid metabolism, mainly with atherogenic forms of low-density lipoproteins (LDL) that are oxidised and methylated, are closely linked to atherosclerosis.

In the context of atherogenesis, oxidised LDL interact with C-reactive protein (CRP) to form oxLDL-CRP complexes, which maintain vascular inflammation and trigger autoimmune reactions.[4]

Some indices of systemic inflammation, such as neutrophils/lymphocytes, neutrophils/HDL-C, monocytes/HDL-C (MHR), among others, are related to ACS. Recently, the MHR has been established as an independent predictor of atherosclerosis and in-stent restenosis.[5]

Recent studies also suggest that factors related to lipid metabolism, such as ANGPTL3 and FABP4, which are involved in inflammation, play an important role in the development of atherosclerosis.[6]

A significant number (18%) of people over 65 years of age without disease have signs of a systemic inflammatory response. However, the increase in the levels of CRP and pro-inflammatory cytokines (TNF-, IL-6, IL-8) in these cases slightly exceeds the upper value of the reference range.[4] In these situations, the action of HDL is very important, helping to eliminate cholesterol from cells present in the endothelium, thus inhibiting the formation of foam cells. The expression of endothelial cellular mediators of inflammation is inversely proportional to HDL levels.[7] A recent study carried out in patients with chronic kidney failure found that the HDL/CRP ratio is positively associated with the glomerular filtration rate and negatively predicts the progression of the disease.[8]

In the Fabregat-Andrés study, the inflammatory state is evaluated with a widely used and known parameter, CRP, which they call non-ultrasensitive. These widely used terms, ''ultrasensitive'' or ''not ultrasensitive'' do not adequately define the technique used in the determination. The determination method must be defined by its metrological sensitivity, precision and detection limit. The initial classic immunological methods for determining CRP in the laboratory had a detection limit between 3 and 8 mg/L. Currently, any immunoturbidimetric or nephelometric method (regardless of its name, ultrasensitive or not), reaches detection limits or functional analytical sensitivities of .1–.2 mg/L. The analytical sensitivity of the method is not mentioned in this study, but the mean CRP values in the studied population were .63 ± .62 mg/L. This indicates that the detection limit is sufficient and adequate. However, these values, in the two groups compared, are clearly lower than those of the patients in the Jupiter study (>2 mg/L), indicating that the study group has a lower inflammatory state. This could be due to the significant number of patients taking drugs.

The proposed ratio with an area under the curve (AUC) of .67, a sensitivity of 73% and a positive predictive value of 68% with respect to carotid arteriosclerosis could be useful to perform more intensive therapy in some patients. An AUC of .678 indicates that the new index has some ability to distinguish between individuals with and without carotid atheromatosis. A sensitivity of 73% suggests that the new index can correctly identify the majority of individuals with carotid atheromatosis. A specificity of 54% suggests that the new index may incorrectly identify some individuals without carotid atheromatosis as positive. Overall, these values indicate that the new index has moderate diagnostic performance for the detection of carotid atheromatosis, but it is important to keep in mind that these values may vary depending on the population and clinical context in which the index is used.

It is necessary to continue evaluating this index in patients with ischemic heart disease, ideally in prospective studies, to determine whether it is appropriate to include this index in the usual practice of risk assessment for our patients.

In summary, this new atherogenic index could be a useful tool in clinical practice to stratify cardiovascular risk, identify risk factors and improve the diagnosis and prognosis of cardiovascular diseases.

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