

Atherosclerosis in ankylosing spondylitis: clinical implications

Miguel A. González-Gay^{1,2,3}, Javier Rueda-Gotor¹

¹ Division of Rheumatology and Epidemiology, Genetics and Atherosclerosis Research Group on Systemic Inflammatory Diseases, Hospital Universitario Marqués de Valdecilla, IDIVAL, Santander, Spain

² University of Cantabria, Santander, Spain

³ Cardiovascular Pathophysiology and Genomics Research Unit, School of Physiology, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa

In the present issue of *Polish Archives of Internal Medicine (Pol Arch Intern Med)*, Ozdowska et al¹ report an increased prevalence of subclinical coronary atherosclerosis in patients with ankylosing spondylitis (AS). They found that the frequency of coronary atherosclerotic plaques assessed by coronary computed tomography angiography was higher in young patients with AS and without diabetes than in matched controls.¹ Although the number of individuals included in the study was relatively small,¹ their results are in line with previous data from a study using carotid ultrasound (another noninvasive way of assessing atherosclerotic disease), which showed an increased carotid-intima media wall thickness and a higher frequency of carotid plaques in patients with AS compared with controls.^{2,3} It is of great relevance since epidemiological studies have confirmed that AS is associated with augmented risk of cardiovascular disease and mortality.⁴

Ozdowska et al¹ revealed an association of coronary plaques with the presence of dyslipidemia and arterial hypertension in patients with AS. The duration of disease from onset of AS symptoms and the erythrocyte sedimentation rate at disease diagnosis were the best predictors of carotid plaques detected by carotid ultrasound in a series of 64 patients who fulfilled the 1984 modified New York diagnostic criteria for AS.² Also, in a set of 149 consecutive patients without history of cardiovascular disease that fulfilled the Assessment of SpondyloArthritis international Society classification criteria for axial spondyloarthritis (115 of them also fulfilled definitions for AS according to the 1984 modified New York criteria), the subgroup of patients with carotid plaques had a longer disease duration than those without plaques when they were studied by carotid ultrasound.³

Taken together, these findings support the claim that subclinical atherosclerosis is common in patients with AS. They also highlight the role of both traditional cardiovascular risk factors and a proinflammatory state, in the context of a chronic disease, in the development of atherosclerosis in these patients. With respect to this, Ozdowska et al¹ described that AS patients with atherosclerotic plaques had higher levels of total cholesterol, low-density lipoprotein (LDL) cholesterol, and triglycerides than those without plaques, with no differences in high-density lipoprotein (HDL) cholesterol levels. Moreover, the atherogenic index was higher in AS patients with plaques than in those without.¹

Interestingly, the first recommendations proposed by the European League Against Rheumatism (EULAR) task force supported the use of the atherogenic index (total cholesterol/HDL cholesterol) rather than total cholesterol in the stratification of the cardiovascular risk of patients with rheumatoid arthritis (RA), another inflammatory joint disease associated with increased cardiovascular mortality.⁵ Chronic inflammation leads to oxidative changes that alter HDL cholesterol structure and reduce apolipoprotein A-I in patients with active RA.⁶ The levels of paraoxonase 1, an antioxidant enzyme associated with HDL cholesterol, are lower in patients with RA when compared with healthy controls. The presence of inflammation leads to impairment of the normal anti-inflammatory, antioxidative, and cardioprotective function of HDL cholesterol that turns out to be proinflammatory.⁷ Moreover, lipids in patients with inflammatory joint diseases have paradoxical associations with the risk of cardiovascular disease since lower levels of total cholesterol and LDL cholesterol are associated with increased risk of cardiovascular events in these patients.⁸

Correspondence to:

Prof. Miguel A. González-Gay, MD, PhD, Division of Rheumatology, Hospital Universitario Marqués de Valdecilla, IDIVAL, Avenida Cardenal Herrera Oria s/n 39011, Santander, Spain, phone: +34 942 29 25 20, email: miguelaggay@hotmail.com

Received: July 29, 2018.

Accepted: July 30, 2018.

Published online: August 31, 2018.

Conflict of interest: none declared.

Pol Arch Intern Med. 2018;

128 (7-8): 409-410

doi:10.20452/pamw.4324

Copyright by Medycyna Praktyczna,

Kraków 2018

One of the main points of concern for clinicians who treat patients with inflammatory arthritis is to identify individuals at high risk of cardiovascular events. Both the first and the 2015/2016 updated EULAR evidence-based recommendations for cardiovascular risk management in patients with RA and other inflammatory joint diseases, such as psoriatic arthritis and AS, strongly support the use of algorithms to stratify the cardiovascular risk of these patients.^{5,9} Risk charts used to assess cardiovascular risk in the general population, such as the Framingham Risk Score, Reynolds equation, and Systematic COronary Risk Evaluation (SCORE), can be applied to determine the cardiovascular risk of patients with inflammatory rheumatic diseases.⁹ However, these risk function charts often underestimate the actual cardiovascular risk of patients with these conditions. This was first observed in patients with RA in whom 2 noninvasive tools to measure atherosclerosis, carotid ultrasound and multidetector computed tomography used to determine the coronary artery calcium score, improved the identification of individuals with high cardiovascular risk.^{10,11} This fact has also recently been confirmed in patients with AS.^{12,13} Because of that, we and other investigators support the use of noninvasive techniques to identify the presence of subclinical atherosclerotic disease in patients with inflammatory joint diseases.¹⁴ With respect to this, we feel that the evaluation of patients for the presence of carotid atherosclerosis, determined by the common carotid intima-media thickness measurement or by the assessment of plaques and plaque areas, may help clinicians identify patients with inflammatory arthritis at high risk of cardiovascular events.¹⁴ In this regard, the updated 2015/2016 EULAR recommendations for cardiovascular disease risk management in patients with and other forms of inflammatory joint disorders support the screening for asymptomatic atherosclerotic plaques by using carotid ultrasound as part of the cardiovascular disease risk evaluation in patients with inflammatory arthritis.⁹

In conclusion, patients with AS have increased frequency of subclinical atherosclerotic disease and are at higher risk of cardiovascular events. Adequate identification of AS at high risk of cardiovascular events by the use of risk charts along with noninvasive imaging techniques is needed to reduce the high prevalence of cardiovascular events in these patients.

DISCLAIMER The opinions expressed by the author are not necessarily those of the journal editors, Polish Society of Internal Medicine, or publisher.

OPEN ACCESS This is an Open Access article distributed under the terms of the Creative Commons AttributionNonCommercialShareAlike 4.0 International License ([CC BY-NC-SA 4.0](https://creativecommons.org/licenses/by-nc-sa/4.0/)), allowing third parties to copy and redistribute

the material in any medium or format and to remix, transform, and build upon the material, provided the original work is properly cited, distributed under the same license, and used for non-commercial purposes only. For commercial use, please contact the journal office at pamw@mp.pl.

REFERENCES

- Ozdowska P, Wardziak L, Kruk M, et al. Increased prevalence of subclinical coronary atherosclerosis in young patients with ankylosing spondylitis. *Pol Arch Intern Med.* 2018; 128: 455-461. [↗](#)
- Gonzalez-Juanatey C, Vazquez-Rodriguez TR, Miranda-Filloo JA, et al. The high prevalence of subclinical atherosclerosis in patients with ankylosing spondylitis without clinically evident cardiovascular disease. *Medicine (Baltimore).* 2009; 88: 358-365. [↗](#)
- Rueda-Gotor J, Corrales A, Blanco R, et al. Atherosclerotic disease in axial spondyloarthritis: increased frequency of carotid plaques. *Clin Exp Rheumatol.* 2015; 33: 315-320.
- Castañeda S, Nurmohamed MT, González-Gay MA. Cardiovascular disease in inflammatory rheumatic diseases. *Best Pract Res Clin Rheumatol.* 2016; 30: 851-869. [↗](#)
- Peters MJ, Symmons DP, McCarey D, et al. EULAR evidence-based recommendations for cardiovascular risk management in patients with rheumatoid arthritis and other forms of inflammatory arthritis. *Ann Rheum Dis.* 2010; 69: 325-331. [↗](#)
- Charles-Schoeman C, Watanabe J, Lee YY, et al. Abnormal function of high-density lipoprotein is associated with poor disease control and an altered protein cargo in rheumatoid arthritis. *Arthritis Rheum.* 2009; 60: 2870-2879. [↗](#)
- Charles-Schoeman C, Lee YY, Grijalva V, et al. Cholesterol efflux by high density lipoproteins is impaired in patients with active rheumatoid arthritis. *Ann Rheum Dis.* 2012; 71: 1157-1162. [↗](#)
- González-Gay MA, González-Juanatey C. Inflammation and lipid profile in rheumatoid arthritis: bridging an apparent paradox. *Ann Rheum Dis.* 2014; 73: 1281-1283. [↗](#)
- Agca R, Heslinga SC, Rollefstad S, et al. EULAR recommendations for cardiovascular disease risk management in patients with rheumatoid arthritis and other forms of inflammatory joint disorders: 2015/2016 update. *Ann Rheum Dis.* 2017; 76: 17-28. [↗](#)
- Corrales A, Parra JA, González-Juanatey C, et al. Cardiovascular risk stratification in rheumatic diseases: carotid ultrasound is more sensitive than Coronary Artery Calcification Score to detect subclinical atherosclerosis in patients with rheumatoid arthritis. *Ann Rheum Dis.* 2013; 72: 1764-1770. [↗](#)
- Corrales A, González-Juanatey C, Peiró ME, et al. Carotid ultrasound is useful for the cardiovascular risk stratification of patients with rheumatoid arthritis: results of a population-based study. *Ann Rheum Dis.* 2014; 73: 722-727. [↗](#)
- Rueda-Gotor J, Llorca J, Corrales A, et al. Carotid ultrasound in the cardiovascular risk stratification of patients with ankylosing spondylitis: results of a population-based study. *Clin Exp Rheumatol.* 2016; 34: 885-892. [↗](#)
- Rueda-Gotor J, Llorca J, Corrales A, et al. Cardiovascular risk stratification in axial spondyloarthritis: carotid ultrasound is more sensitive than coronary artery calcification score to detect high-cardiovascular risk axial spondyloarthritis patients. *Clin Exp Rheumatol.* 2018; 36: 73-80.
- Kerekes G, Soltész P, Nurmohamed MT, et al. Validated methods for assessment of subclinical atherosclerosis in rheumatology. *Nat Rev Rheumatol.* 2012; 8: 224-234. [↗](#)