President's Page

Stable Coronary Artery Disease

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For the clinical or interventional cardiologist, stable coronary artery disease (SCD) represents a substantial part of everyday practice, given that its prevalence in middle and advanced ages is quite high, as much as 14%, while its annual incidence ranges from around 1% in middle-aged individuals up to 4% in the elderly. Although the incidence of SCD shows no sign of decreasing, coronary mortality in recent years has shown a tendency to fall, reflecting an improvement in the prognosis of patients with SCD.

The European Society of Cardiology recently published new guidelines for the treatment of patients with SCD.[1] These guidelines recommend that in every case where SCD is suspected an investigation should be started to determine the patient's pre-test probability (PTP) of SCD. This initial step should be followed by an non-invasive – preferably imaging – diagnostic verification of the disease, after which appropriate medication should be started at an optimum dosage. The risk stratification begins with the history and the initial clinical, laboratory, and imaging findings, and aims to identify the high-risk patients who will benefit from an invasive reperfusion strategy.

The guidelines place special emphasis on the determination of PTP. In fact, the "new PTP total" is based on databases from 2011.[2-3] Traditionally, PTP used to be based on the data of Diamond and Forrester from 1979,[4] but compared with 1979 the prevalence of stenoses in patients with angina in 2013 was clearly lower. However, even the new PTP is calculated based on the characteristics of the angina (typical angina versus atypical angina versus non-anginal pain), and the patient's age and sex. Thus, in a patient with suspicion of coronary artery disease, if the PTP is low (<15%), "look for other causes and think about the presence of functional coronary artery disease". If the PTP is high (>85%), the clinical diagnosis of SCD is automatic. Further diagnostic examinations are not expected to improve the accuracy and are recommended only for risk stratification. In patients with intermediate PTP, between 15% and 85%, the diagnosis of SCD should be based on a non-invasive stress test. In patients with severe symptoms, which do not respond to medication, or "clinical findings that show a high-risk coronary anatomy", we should proceed directly to coronary angiography with the possibility of invasive treatment.

The guidelines assign an important role to "modern imaging techniques", such as cardiac and carotid artery ultrasound, imaging stress tests, cardiac magnetic resonance (CMR), and cardiac computed tomography angiography (CCTA). Thus, they recommend that an ultrasound examination of the heart and carotids should be performed in all individuals who are under investigation for chest pain, with the aim of ruling out alternative causes, detecting regions with motion disturbances, determining the left ventricular ejection fraction, as well as estimating the carotid artery intima–media thickness and any presence of carotid plaques, which confirm the presence of atherosclerotic disease and increase the PTP of subsequent diagnostic techniques. Although the guidelines recommend imaging stress tests (stress echo, SPECT) unreservedly for the diagnosis of SCD, they retain the traditional electrocardiographic stress test as a diagnostic tool in patients with a PTP between 15-65% – because it is easy to perform, widely available, and inexpensive – despite its low sensitivity, which does not exceed 50%. With regard to the new imaging techniques (CMR, CCTA, PET), the authors

tried to strike a balance between the conservatism of the USA guidelines of 2012[5] and the progressiveness of the NICE guidelines of 2010.[6,72] Given that the data for CCTA are not yet strongly documented, it only received a class II indication, with level of evidence A, and the guidelines point out that we should be thinking about performing CCTA to rule out SCD, as an alternative to imaging stress tests, only in patients who are in the lower part of the intermediate PTP range (15-65%) and in whom a good quality image can be expected. We may also use it for patients in the same PTP band if stress tests are non-diagnostic or are contraindicated, with a view to avoiding invasive coronary angiography. We also have three class III indications: we should not perform CCTA for the diagnosis of SCD in asymptomatic individuals with no previous clinical suspicion of coronary artery disease; we should not perform CCTA in patients who have undergone reperfusion interventions; and we should not perform CCTA in patients who show high levels of calcification (Agatston score >400). In addition, many patients come to the cardiac catheterisation laboratory without having undergone stress testing and with no evidence as to the existence or not of ischaemia. We now have laboratory tools to quantify coronary blood flow, such as fractional flow reserve (FFR), and to determine the presence of ischaemia. The use of FFR to reveal haemodynamically significant stenoses has received a class I indication with level of evidence A. Intravascular ultrasound or optical coherence tomography may be used (class II, level of evidence B) with a view to evaluating the characteristics of lesions, and mainly to assist in the correct deployment and placement of stents.

The goals in the treatment of patients with SCD are the elimination of symptoms and the improvement of prognosis. These goals may be achieved as follows: 1) by modifying health and dietary habits (stopping smoking, observing a Mediterranean type diet, doing daily aerobic exercise of moderate intensity, maintaining ideal body weight); 2) by controlling risk factors so that levels of low-density lipoprotein cholesterol are maintained below 70 mg/dL, blood pressure below 140/90 mmHg, and glycosylated haemoglobin below 6.5%, through the administration of statins, antihypertensive and antidiabetic medication, respectively; 3) by reducing angina, through the administration of short- or long-acting nitrates, beta-blockers, calcium channel blockers, as first-line antianginal medication, while there are also second-line choices with the addition of three new drugs, namely ivabradine, ranolazine, and nicorandil (all class IIa); and 5) by avoiding destabilisation of atheromatous plaque and the occurrence of acute thrombotic episodes, through the lifelong administration of low-dose aspirin, with the addition of clopidogrel after either an acute coronary episode or a percutaneous coronary intervention. In the case where there is also heart failure, hypertension, or diabetes mellitus, the administration of inhibitors of the renin–angiotensin–aldosterone axis should be considered mandatory (class Ia).

In patients who have symptoms that are refractory to medication and/or clinical or laboratory criteria showing high risk, an invasive coronary angiographic examination should be performed. If the coronary angiogram shows anatomically severe or extensive disease, the patient should undergo reperfusion. Regarding the latter, the guidelines venture into deep water where there is heated disagreement between cardiac surgeons and interventionists. There are now clear and specific guidelines, which depend to a large extent on the SYNTAX score. Thus, in patients with haemodynamically significant stenosis of the main coronary stem, if only one vessel is involved, percutaneous coronary intervention should be used for ostial and main vessel lesions. However, for distal bifurcation lesions the case should be discussed by a group of invasive cardiologists and cardiac surgeons as regards the best invasive strategy. In multivessel coronary artery disease, the SYNTAX score should be consulted. If the score is ≤32, discussion between cardiologists and cardiac surgeons is needed; however, if it is ≥33, coronary artery bypass grafting should be selected.

The guidelines recommend the use of drug-eluting stents for all types of lesions, provided of course that there is no contraindication to the prolonged administration of dual antiplatelet medication. The new antiplatelet drugs (prasugrel, ticagrelor) are recommended only in cases of increased thrombotic risk, such as main-stem disease, diabetes, or in patients with a history of stent thrombosis under clopidogrel. Based on available data, the duration of dual antiplatelet medication after placement of a drug-eluting stent should be at least 6-12 months.

The European guidelines are a useful consulting tool for the management of patients with SCD, corresponding to modern reality, attempting a balance between cost and benefit, while always giving priority to the correct management of the individual patient.

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