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REFERENCES

1. Pöss J, Köster J, Fuernau G, et al. Risk stratification for patients in cardiogenic shock after acute myocardial infarction. *J Am Coll Cardiol.* 2017;69:1913–1920.
2. Ouweneel DM, Eriksen E, Sjauw KD, et al. Percutaneous mechanical circulatory support versus intra-aortic balloon pump in cardiogenic shock after acute myocardial infarction. *J Am Coll Cardiol.* 2017;69:278–287.
3. Kirkegaard H, Søreide E, Haas I. de. et al. Targeted temperature management for 48 vs 24 hours and neurologic outcome after out-of-hospital cardiac arrest: a randomized clinical trial. *JAMA.* 2017;318:341–350.
4. Mehta RH, Leimberger JD, van Diepen S, et al. Levosimendan in patients with left ventricular dysfunction undergoing cardiac surgery. *N Engl J Med.* 2017;376:2032–2042.
5. Landoni G, Lomivorotov VV, Alvaro G, et al. Levosimendan for hemodynamic support after cardiac surgery. *N Engl J Med.* 2017;376:2021–2031.
6. Hofmann R, James SK, Jernberg T, et al. Oxygen therapy in suspected acute myocardial infarction. *N Engl J Med.* 2017;377:1240–1249.

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Selection of the Best of 2017 in Ischemic Heart Disease

Selección de lo mejor del año 2017 en cardiopatía isquémica

To the Editor,

Here, we summarize 6 salient articles published in 2017 covering various aspects related to ischemic heart disease.

In the area of secondary cardiovascular prevention, there are 3 articles in particular that could prompt significant changes in strategies aimed at reducing long-time risk in patients with ischemic heart disease. First, the FOURIER trial[1] compared the efficacy and safety of evolocumab (a PCSK9 inhibitor) with that of placebo in 27 564 statin-treated patients with atherosclerotic cardiovascular disease and low-density lipoprotein-cholesterol (LDL-C) $\geq$ 70 mg/dL. During follow-up (median, 2.2 years), the group treated with evolocumab experienced a marked drop in LDL-C (median reduction, 30 mg/dL) and a significant decrease in cardiovascular events (9.8% in the evolocumab group vs 11.3% in the placebo group), without differences in severe adverse effects.

The second article analyzed the antithrombotic regimens of patients with chronic ischemic heart disease. The researchers in the COMPASS trial[2] randomized 27 395 patients to rivaroxaban (2.5 mg/12 h) plus aspirin (100 mg/d), rivaroxaban (5 mg/12 h), or aspirin (100 mg/d). The study was prematurely stopped (mean follow-up, 23 months) due to the superiority of rivaroxaban plus aspirin in the reduction of the primary outcome (composite of cardiovascular death, stroke, and myocardial infarction) vs aspirin alone (4.1% vs 5.4%; $P < .001$). Although the combination strategy was accompanied by higher incidence of major bleeding (3.1% vs 1.9%; $P < .001$), there were no significant differences in intracranial or fatal bleeding.

In addition to novelties in the control of risk factors and optimization of antithrombotic therapy, the CANTOS clinical trial[3] has put the focus back on inflammation as a key element in the genesis of residual risk in stable ischemic heart disease. The study evaluated the efficacy and safety of canakinumab (monoclonal antibody inhibitor of interleukin-1) vs placebo in 10 061 patients with previous myocardial infarction and persistent inflammatory activity (elevated C-reactive protein). After a 48-month follow-up, patients treated with subcutaneous canakinumab 150 mg every 3 months had lower incidence of the composite primary end point (cardiovascular death, stroke, and cardiovascular events) than those treated with placebo (3.86 vs 4.50 events per 100 person-years; hazard ratio [HR] = 0.85; 95% confidence interval [95%CI], 0.74-0.98; $P = .021$).

Regarding acute coronary syndromes (ACSs), a noteworthy study examined myocardial infarction screening in patients attending for chest pain. Boeddinghaus et al.[4] compared the 4 validated strategies involving high-sensitivity troponin I (hs-cTnI): limit of detection (hs-cTnI $<$ 2 ng/L), single cutoff point (hs-cTnI $<$ 5 ng/L), 1-hour algorithm (hs-cTnI $<$ 5 ng/L and 1-h change $<$ 2 ng/L), and the 0/1-hour algorithm recommended by the European Society of Cardiology (combination of the limit of detection and the 1-hour algorithm). The authors prospectively included 2828 unselected patients who presented with suspected myocardial infarction. The 4 algorithms showed an adequate diagnostic validity, although the single cutoff point was less sensitive than the other 3 algorithms in early presenters (within 2 hours of symptom onset).

The PROSPERO meta-analysis of non-ST-segment elevation ACS, by Jobs et al.,[5] included 8 clinical trials with 5324 patients randomized to either early or delayed invasive treatment. In the overall analysis, the early invasive strategy failed to improve survival. Nonetheless, this strategy significantly reduced mortality in some prespecified subgroups: those with elevated biomarkers at admission (HR = 0.761; 95%CI, 0.581-0.996), diabetes (HR = 0.67; 95%CI, 0.45-0.99), GRACE score $>$ 140 (HR = 0.70; 95%CI, 0.52-0.95), and age $\geq$ 75 years (HR = 0.65; 95%CI, 0.46-0.93), even if the interactions among these factors failed to show conclusive results in statistical testing.

Regarding ST-segment elevation ACS, in addition to the recent publication of the new European guidelines, whose breadth surpasses the aims of this letter, the COMPARE-ACUTE clinical trial[6] was performed to clarify the benefit of PCI of noninfarct-related coronary arteries in patients with multivessel disease. Accordingly, 885 patients with ST-segment elevation ACS and multivessel disease treated with primary PCI of the infarct-related artery were ran-

domized to either fractional flow reserve-guided complete revascularization or no revascularization of noninfarct-related arteries. The patients assigned to the fractional flow reserve-guided complete revascularization had lower incidence of the primary composite end point of cardiovascular death, myocardial infarction, stroke, or repeat revascularization (8% vs 21%; HR = 0.35; 95%CI, 0.22-0.55; $P < .001$), largely due to the variable new revascularization, defined as urgent revascularizations at any time or elective revascularizations performed within 45 days.

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REFERENCES

1. Sabatine MS, Giugliano RP, Keech AC, et al. Evolocumab and clinical outcomes in patients with cardiovascular disease. *N Engl J Med.* 2017;376:1713–1722.
2. Eikelboom JW, Connolly SJ, Bosch J, et al. Rivaroxaban with or without aspirin in stable cardiovascular disease. *N Engl J Med.* 2017. http://dx.doi.org/10.1056/NEJMoa1709118. Consultado 31 Ago 2017.
3. Ridker PM, Everett BM, Thuren T, et al. Antiinflammatory therapy with canakinumab for atherosclerotic disease. *N Engl J Med.* 2017. http://dx.doi.org/10.1056/NEJMoa1707914. Consultado 31 Ago 2017.
4. Boeddinghaus J, Nestelberger T, Twerenbold R, et al. Direct comparison of 4 very early rule-out strategies for acute myocardial infarction using high-sensitivity cardiac troponin I. *Circulation.* 2017;135:1597–1611.
5. Jobs A, Mehta SR, Montalescot G, et al. Optimal timing of an invasive strategy in patients with non-ST-elevation acute coronary syndrome: a meta-analysis of randomised trials. *Lancet.* 2017;390:737–746.
6. Smits PC, Abdel-Wahab M, Neumann FJ, et al. Fractional flow reserve-guided multivessel angioplasty in myocardial infarction. *N Engl J Med.* 2017;376:1234–1244.

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Selection of the Best of 2017 in Cardiac Imaging and Structural *Interventionism*

Selección de lo mejor del año 2017 en imagen cardiovascular en el intervencionismo estructural

To the Editor,

The number and type of percutaneous catheterization techniques used for structural heart disease have exponentially increased in recent years. Diverse imaging techniques play fundamental roles before, during, and after these procedures.10.1016/j.recesp.2017.10.003

For transcatheter aortic valve implantation (TAVI), 2017 began with the publication of the 5-year echocardiographic follow-up of the PARTNER-I study,[1] which confirmed the mid-to-long-term durability and stability of hemodynamic parameters after this procedure. Computed tomography (CT) continues to show superior reproducibility and ability to determine prosthesis size and the degree of its oversizing. In addition, during the postimplantation follow-up, CT is essential for detecting subclinical prosthetic thrombosis (areas of hypoattenuation in the prosthetic cusps), with an approximate incidence of 14.3%, which was not associated with increased prosthetic gradients or embolic events.

The field of percutaneous mitral valve interventions is expanding to include new devices aimed at repairing the valve using neochord implantation, rings, and edge-to-edge plication, together with the development of percutaneous mitral prostheses. The role of imaging in indication evaluation and monitoring has been strengthened. Publications from 2017 were oriented at identifying prognostic indicators based on percutaneous repair outcomes. A notable work by Neuss et al.[2] reported worse 2-year vital prognosis for patients with a mean residual gradient > 4.4 mmHg by echocardiography (or 5 mmHg using invasive measurement), with a significant difference in the number of clips implanted per patient (1.3 vs 1.5 in the stenotic group). Regarding tricuspid valve interventions, the year began with multiple new repair systems and promising results. Because echocardiographic analysis of the tricuspid valve is poorly established, various groups have published recommendations on imaging analysis of the so-called forgotten valve. Another standout is the work by Hahn,[3] with an excellent interventional cardiology-focused evaluation of the functional anatomy of the tricuspid valve.

Regarding periprosthetic leaks, an expert consensus was published in 2017 that includes recommendations for the quantification and characterization of periprosthetic leaks with multimodality imaging.[4] In addition, the results were presented of a real-life Spanish clinical practice registry that shows the reliability and safety of the procedure.

In the field of left atrial appendage closure, one particularly pertinent article used various imaging techniques to show a significant intraprocedural increase in atrial appendage size after volume loading, with 3-dimensional echocardiography the most accurate technique for gauging the correct size of the device.[5] In addition, prospective data from clinical practice, with more than 1000 patients treated with the Amulet device and 3-month echocardiographic follow-up in more than half of the patients, revealed a high rate of appendage occlusion (98.2%) with low rates of device thrombus (1.5%) in follow-up.

For percutaneous closure of the patent foramen ovale, the main contribution in 2017 has been the presentation of the preliminary results of the GORE-REDUCE study (NCT00738894), which showed the superiority of percutaneous occlusion over medical treatment in secondary prevention for patients younger than 60 years with septal aneurysm and a large defect, with echocardiography used to select ideal candidates. These results will probably be incorporated into the next guidelines.

Regarding congenital heart diseases, recommendations were published in 2017 on the value of 3-dimensional echocardiogra-