Main results of the European Society of Cardiology Congress 2023

From August 25 to 28, 2023, the regular Congress of the European Society of Cardiology was held in a hybrid format (onsite and online) in Amsterdam (the Netherlands). The event was attended by about 31,000 specialists from 150 countries.

Congress participants reviewed 5 new clinical guideline texts:

- on the treatment of endocarditis;
- on the treatment of cardiovascular diseases in diabetic patients;
- on the treatment of cardiomyopathies;
- on the treatment of acute coronary syndromes;
- the targeted update of the European Society of Cardiology 2021 guidelines on the diagnosis and treatment of acute and chronic heart failure.

The full texts of these documents are available at www.escardio.org/Clinical Practice Guidelines.

The most interesting events of the Congress are traditionally recognized as HOT LINE scientific sessions, where the results of the most important clinical trials are presented for the first time. This time the participants of the event had an opportunity to get acquainted with 29 specially selected randomized trials in 9 sessions during 4 days. Their most important results are summarized below.

STEP-HFpEF. In patients with heart failure with preserved ejection fraction and obesity, treatment with semaglutide at a dose of 2.4 mg subcutaneously once weekly for 52 weeks was associated with a significant improvement in quality of life (by 7.8 points on the Kansas City Cardiomyopathy Questionnaire), reduction in body weight (by 10.7%), increase in 6-minute walk distance (by 20.3 m), and reduction in C-reactive protein levels, compared with placebo.

NOAH-AFNET 6. Elderly patients with episodes (at least 6 minutes) of frequent (≥170 beats per minute) atrial pacing detected by implantable devices and at least one risk factor for stroke were assigned to standard treatment with edoxaban or placebo. The trial was stopped early due to safety concerns after a mean follow-up of 21 months. The incidence of stroke was approximately 1% per patient-year in both groups. There was no significant reduction in the incidence of cardiovascular death, stroke or systemic embolism with edoxaban compared to placebo, but a significant increase in the incidence of death from any cause or major bleeding (p=0.03).

COP-AF. Patients undergoing major non-cardiac thoracic surgery (lung lobe resection and others) received colchicine 0.5 mg or placebo 4 hours prior to surgery and twice daily for 10 days. Clinically significant perioperative atrial fibrillation was observed in 6.4% and 7.5% (p=0.22), and myocardial damage in 18.3% and 20.3% (p=0.16) of patients receiving colchicine and placebo, respectively. Sepsis or infection was reported in 6.4% of patients in the colchicine group and 5.2% in the placebo group. Colchicine administration was significantly more associated with the development of non-infectious diarrhea (8.3% of cases vs. 2.4% with placebo).

QUEST. The combination herbal medicine qiliqiangxin capsules or placebo were added to standard therapy for chronic heart failure with reduced left ventricular ejection fraction (≤40%). During a medi-

an follow-up of 18.3 months, the primary endpoint (rehospitalization for heart failure decompensation or cardiovascular death) was observed in 25.02% of patients in the qiliqiangxin group versus 30.03% in the placebo group (p<0.001). There were no significant differences between groups in all-cause mortality and adverse events, including gastrointestinal symptoms, worsening renal function, and elevated liver enzymes.

BUDAPEST-CRT Upgrade. The study included patients with an implantable cardioverter defibrillator and intermittent or continuous right ventricular pacing with a stimulated QRS complex duration of at least 150 m/s. The addition of a left ventricular stimulation lead implanted in the lateral branch of the coronary sinus resulted in a reduced risk of the primary endpoint of hospitalization for heart failure, all-cause death or no reverse myocardial remodeling (32.4% vs. 78.9%; p<0.001). The hospitalization rate for heart failure or all-cause mortality was 10.2% vs. 34.7% (p<0.001) compared to the control group during 12 months of follow-up.

HEART-FID. Intravenous iron carboxymaltose or placebo was added to the treatment regimen for chronic heart failure with reduced (≤40%) left ventricular ejection fraction in iron-deficient patients. At 12 months, there were no significant differences in the all-cause mortality(8.6% vs. 10.3% of cases) and hospitalization for heart failure (13.3% vs. 14.8%) in the iron carboxymaltose and placebo groups, respectively, although the 6-minute walk distance increased by 8 m in the carboxymaltose group and by 4 m in the placebo group at 6 months (p=0.02). The incidence of serious adverse events during treatment was not significantly different between groups.

FIRE. Patients aged ≥75 years with myocardial infarction and multivessel coronary stenoses underwent percutaneous coronary intervention (PCI) with stenting of all arteries with hemodynamically significant narrowing or only of the infarct-related artery. The combined primary endpoint of death, myocardial infarction, stroke, or any revascularization procedure at one year was less frequent in the complete revascularization group (15.7% vs. 21.0% in the culprit artery stenting group), and the safety of the procedure (composite of stroke, bleeding, or contrast-related acute kidney injury) was comparable (p=0.37).

ECLS-SHOCK. Patients with myocardial infarction complicated by cardiogenic shock who were scheduled for early revascularization were treated with venoarterial extracorporeal membrane oxygenation plus conventional medical therapy or conventional medical therapy alone (control group). The primary efficacy endpoint, death from any cause at 30 days, was observed in 47.8% versus 49.0% of patients in the full extracorporeal support and control groups, respectively (p=0.81). In the first group, moderate or major bleeding was 2.44 times more frequent and peripheral vascular complications requiring intervention were 2.86 times more frequent.

STOPDAPT-3. Patients with acute coronary syndromes and a high risk of bleeding after PCI were randomized to antiplatelet monotherapy with prasugrel or a combination of aspirin (for 1 month) with prasugrel. The 30-day cumulative incidence of cardiovascular death, myocardial infarction, definite stent thrombosis, or ischemic stroke (4.12% vs. 3.6–9%) and the risk of Academic Research Consortium type 3 or 5 bleeding (4.71% vs. 4.47%) were not significantly different between the monotherapy and dual therapy groups. Antiplatelet monotherapy increased the risk of subacute definite or probable stent thrombosis by 3.4-fold and the risk of unplanned coronary revascularization by 83%.

ILUMIEN IV. Percutaneous coronary intervention in patients with complex coronary artery lesions was performed under control of optical coherence tomography or conventional angiography. There was a significant difference in the minimum stent area (5.72±2.04 mm^2 vs. 5.36±1.87 mm^2; p<0.001) with a similar cumulative incidence of adverse outcomes — death from cardiac causes, myocardial infarction or revascularization due to ischemia in the target artery area at 2 years (7.4% and 8.2% of cases; p=0.45) in the optical coherence tomography and angiography groups, respectively. The stent thrombosis at 2 years occurred in 0.5% vs. 1.4% of cases (p=0.02).

OCTOBER. Patients with clinical indications for percutaneous coronary intervention and complex bifurcation lesions underwent revascularization with optical coherence tomography or conventional angiography. At a mean follow-up of 2 years, the composite of the primary endpoint — cardiac death, myocardial infarction, or target artery revascularization for ischemia — occurred in 10.1% of patients in the optical coherence tomography group and 14.1% in the angiography group (p=0.035). Procedural complications were similar in both groups.

OCTIVUS. Patients with significant coronary artery lesions underwent percutaneous coronary intervention under optical coherence tomography or intravascular ultrasound guidance. After one year of follow-up, the event rate of the primary endpoint, death from cardiac causes, myocardial infarction or revascularization due to ischemia in the target artery area, was 2.5% in the optical coherence tomography group and 3.1% in the intravascular ultrasound group (p<0.001 for no less efficacy). The risk of contrast-induced nephropathy was similar in the two groups (p=0.85).

ATTRibute-CM. Elderly patients with transthyretin amyloid cardiomyopathy were prescribed akoramidis 800 mg twice daily or placebo twice daily for 30 months, with open-label tafamidis allowed after 12 months at the discretion of the physician. The akoramidis group demonstrated a statistically significant superiority in the risk of the primary combined endpoint.with a hazard ratio of 1.772 (p<0.0001). Hierarchical analysis prioritized the endpoints in the following order: all-cause mortality, the incidence of cardiovascular-related hospitalizations, the change from baseline in the N-terminal precursor of brain natriuretic peptide, the change from baseline in 6-minute walk distance. In addition, acoramidis was associated with a 50% reduction in the relative risk of cardiovascular hospitalization (p<0.0001).

ARREST. Patients with spontaneous circulatory recovery after out-of-hospital cardiac arrest without ST-segment elevation were transported by London ambulance services to one of 7 cardiac arrest centers or to the geographically closest emergency department. The primary endpoint, 30-day all-cause mortality, was 63% in the cardiac arrest center group and 63% in the standard of care group (unadjusted hazard ratio 1.00; p=0.96).

ADVENT. Patients with paroxysmal atrial fibrillation refractory to antiarrhythmic drugs underwent pulsed field catheter ablation or conventional radiofrequency or cryoballoon (thermal) catheter ablation to isolate the pulmonary vein orifices. At 1 year of follow-up, the primary efficacy endpoint of freedom from primary procedure failure, documented atrial tachyarrhythmia after a 3-month blinded period, antiarrhythmic drug use, cardioversion, or repeat ablation was reported in 73.3% versus 71.3% of cases in the pulsed field and thermal ablation groups, respectively. The incidence of serious adverse events was similar in both groups.

MULTISTARS AMI. Hemodynamically stable patients with ST-segment elevation myocardial infarction and multivessel coronary heart disease underwent either immediate multivessel PCI (emergency group) or first intervention on the "culprit" artery followed by staged multivessel intervention on the "non-culprit" arteries within 19–45 days after the index procedure (staged group). During one year of follow-up, the composite of primary endpoint events — all-cause mortality, non-fatal myocardial infarction, stroke, unplanned ischemia-driven revascularization, or hospitalization for heart failure — was 8.5% in the immediate treatment group versus 16.3% in the staged treatment group (p<0.001 for no less effective and p<0.001 for superior).

CASTLE HTx. Patients with symptomatic atrial fibrillation and end-stage heart failure (ejection fraction ⩽35%) received catheter ablation to restore sinus rhythm and drug therapy or drug therapy alone. At a median follow-up of 18 months, the primary endpoint of death from any cause, left ventricular assist device implantation or urgent heart transplantation was observed in 8% of the ablation group and 30% of the drug therapy alone group (p<0.001).

FRAIL-AF. Patients with non-valvular atrial fibrillation and frailty aged ⩾75 years with a glomerular filtration rate ⩾30 ml/min/1.73m^2 were switched to direct oral anticoagulants or continued on vitamin K antagonists. After 12 months of follow-up, major and clinically significant bleeding (primary endpoint) occurred in 15.3% vs. 9.4% of cases (p=0.00112), and the incidence of thromboembolic complications was 2.4% vs. 2.0% in the direct oral anticoagulant and vitamin K antagonist groups, respectively.

OPT-BIRISK. Patients undergoing PCI for acute coronary syndromes at high bleeding risk and high ischemic risk received dual antiplatelet therapy (clopidogrel plus aspirin) for 9–12 months, then 9 months of clopidogrel plus aspirin or clopidogrel plus placebo, followed by 3 months of aspirin alone. The risk of type 2, 3, or 5 bleeding according to the Bleeding Academic Research Consortium classification was lower in the group without aspirin (2.5% vs. 3.3%; p=0.03) after 9 months of the different therapies. The cumulative risk of all-cause death, myocardial infarction, stroke or clinically driven revascularization was also lower in the aspirin-free group (2.6% vs. 3.5%; p=0.02).

ARAMIS. The subcutaneous administration of the interleukin-1 receptor antagonist anakinra 100 mg

once daily was compared with placebo in hospitalized patients with symptomatic acute myocarditis and elevated cardiac troponin levels receiving standard therapy. The primary efficacy endpoint, the number of days free of myocarditis complications after hospital discharge, averaged 30 days in the anakinra group and 31 days in the placebo group. The safety endpoint, the number of serious adverse events within 28 days of discharge, was observed in 12.1% of patients receiving anakinra and 10.2% of patients receiving placebo, with no significant differences between groups.

DANPACE II. Patients with sick sinus syndrome were initially implanted with pacemakers programmed to a baseline rate of 60 beats per minute with rate-adaptive pacing (DDDR-60) or a baseline rate of 40 beats per minute without rate-adaptive pacing (DDD-40). After 2 years of remote monitoring, there were no differences between the groups in the number of atrial fibrillation episodes lasting longer than 6 minutes (46% of cases each), longer than 6 hours or longer than 24 hours. There were no significant differences in frequency of progression to persistent or permanent atrial fibrillation, cardioversion for atrial fibrillation, and all-cause mortality. In addition, quality of life and 6-minute walk test results at 12 months were similar in both groups.

RED–CVD. Patients with chronic obstructive pulmonary disease and/or diabetes mellitus in primary care were compared in a diagnostic intervention consisting of three steps:

- assessment of symptoms using a questionnaire;
- physical examination, determination of N-terminal brain natriuretic peptide precursor levels, as well as an electrocardiogram recording;
- at the discretion of the primary care physician, referral to a cardiologist if abnormalities were detected, as well as usual care.

Patients progressed to the next stage if they scored above a certain threshold. At one year, new diagnoses of cardiovascular disease (8.0% vs. 3.0%), heart failure (4.5% vs. 1.5%), atrial fibrillation (2.1% vs. 0.8%), and coronary heart disease (2.6% vs. 1.4%) were higher in the intervention group than in the usual care group.

NITRATE-CIN. In patients with acute coronary syndrome without ST-segment elevation referred for invasive coronary angiography and at risk for contrast-induced nephropathy, the efficacy of once-daily potassium nitrate (12 mmol) was compared with placebo (potassium chloride) in a capsule form for 5 days. There was a significant reduction in the risk of contrast-induced nephropathy (elevation of creatinine levels ≥26.5 μmol/L within 48 hours or ≥1.5 times within a week) of 9.1% vs. 30.5%, (p<0.0001), procedural myocardial infarction (2.7% vs. 12.5%; p=0.003) and major cardiovascular complications within one year (9.1% vs. 18.1% of cases; p=0.001) in the inorganic nitrate group, compared with placebo.

DICTATE-AHF. Patients with type 2 diabetes mellitus and a calculated glomerular filtration rate of at least 25 ml/min/1.73 m^2 hospitalized for acute decompensated heart failure with hypervolemia and receiving intravenous loop diuretics were randomized to receive dapagliflozin 10 mg/day or standard therapy for the first 24 hours. After 5 days or up to the day of discharge, there was no advantage of dapagliflozin in affecting the ratio of weight change in kg/dose of loop diuretic in mg. However, dapagliflozin significantly increased 24-hour natriuresis (p=0.025) and 24-hour diuresis (p=0.005), and shortened the time to completion of intravenous diuretic therapy (p=0.006) and time to hospital discharge (p=0.007).

PUSH-AHF. Treatment of acute heart failure with natriuresis testing at 2, 6, 12, 18, 24 and 36 hours after initiation of intravenous loop diuretics with possible dose adjustment was compared with standard therapy. During the first 24 hours, natriuresis was significantly higher in the natriuresis control group (p=0.0061), but the risk of all-cause mortality or hospitalization for heart failure at 180 days was the same as in the conventional treatment group (31% in both groups; p=0.70).

RIGHT. Patients undergoing primary PCI with bivalirudin for ST-segment elevation myocardial infarction received anticoagulant therapy within 4 hours of the procedure:

1) unfractionated heparin at 10 units/kg/hour intravenously with dose adjustment to maintain an activated clotting time of 150–220 s enoxaparin at a dose of 40 mg once daily subcutaneously OR

3) bivalirudin 0.2 mg/kg/hour intravenously or placebo (ie, no anticoagulant therapy) for ≥48 hours.

At 30 days, there was no difference in the cumulative incidence of the primary efficacy endpoint (all-cause mortality, non-fatal myocardial infarction, non-fatal stroke, definite stent thrombosis, or urgent revascularization of any vessel at 30 days) between the anticoagulation and placebo groups (p=0.988).

However, there was a significant relationship between the primary efficacy endpoint and the type of anticoagulant used. Enoxaparin reduced the risk of adverse outcomes by 54 % compared to placebo, while unfractionated heparin increased the risk by 3.71-fold and bivalirudin by 1.24-fold. The incidence of the primary safety endpoint (major bleeding) was not different between the two groups (p=0.511) and there was no significant interaction between the three anticoagulants (p for interaction=0.679).

ONCO DVT. Cancer patients with isolated distal deep vein thrombosis were treated with edoxaban for 12 or 3 months. At one year, the primary endpoint of symptomatic recurrent venous thromboembolism or VTE-related death was reported in 1.0 % vs. 7.2 % of cases (p<0.001) and major bleeding according to International Society on Thrombosis and Hemostasis criteria was in 9.5 % vs. 7.2 % of cases in the 12-month and 3-month therapy groups, respectively.

A meta-analysis of the **DARE-19**, **RECOVERY** and **ACTIV-4A** studies. Participants in the three trials who were hospitalized for COVID-19 received either sodium-glucose cotransporter type 2 inhibitors (n=3025) or conventional treatment/placebo alone (n=3071) after randomization. The primary endpoint of all-cause mortality within 28 days occurred in 11.7 % and 12.4 % of patients in the sodium-glucose cotransporter type 2 inhibitor and conventional treatment/placebo groups, respectively. There were also no significant differences in the risk of progression to acute kidney injury, need for dialysis, conversion to invasive mechanical ventilation, or extracorporeal membrane oxygenation within 28 days. These results do not support the use of type 2 sodium-glucose cotransporter inhibitors as standard therapy in this clinical setting, but routine withdrawal of these drugs prescribed for other indications (heart failure, chronic kidney disease or type 2 diabetes mellitus) during COVID-19 does not seem justified.

The next Congress of the European Society of Cardiology is planned to be held in the United Kingdom (onsite and online) in London from August 30 to September 2, 2024.

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