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EXPERT OPINION

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Highlights of American Heart Association Scientific Sessions 2020: a virtual experience

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The year 2020 has been unique and defiant due to pandemic of COVID-19. One of the new over-used terms this year is finding the 'new normal'. Indeed, COVID-19 has transformed the scientific congress experience significantly. Social distancing and travel restrictions have enforced congress coordinators to make a tough decision between cancelling the events or re-formatting for online presentations. The American Heart Association (AHA) presented Scientific Sessions 2020 (13–17 November) as a 100% virtual experience, reached more people than ever, in real-time and asynchronously, with live chats that inspire scientific dialogues, providing an engaging online involvement. A wide variety of subjects were presented, ranging from new heart failure (HF) treatments to cardiovascular involvement in COVID-19 and a special focus in structural racism.

The AHA Scientific Sessions showcased awaited several clinical trial results. Some of the exciting science included fresh takes on primary cardiovascular disease (CVD) prevention. In a new first-of-its-kind international outcomes trial, *TIPS-3*, involving more than 5000 patients with an intermediate CVD risk but no known CVD, treatment with a polypill formulation (simvastatin, atenolol, ramipiril, and hydrochlorothiazide), plus aspirin led to a lower incidence of cardiovascular events. In *VITAL-Rhythm* trial, involving more than 20 000 patients, treatment with vitamin D3, Omega-3 fatty acids, or a combination had no effect on the incidence of atrial fibrillation (AF), the most common cardiac arrhythmia and a major cause of morbidity and mortality,[1] over a median treatment duration of 5.3 years. Likewise, in the AF field, *SEARCH-AF* study demonstrated that enhanced cardiac rhythm monitoring detected a higher incidence of post-operative AF after cardiac surgery, as compared to the usual care, in those who had no history of AF but had a high risk of stroke. Also, the *VITAL-AF* trial showed that point-of-care screening did not result in more new AF diagnoses in primary care, whereas *mSToPS* study found that continuous monitoring with a wearable electrocardiogram patch did lead to more AF detected and even better outcomes, emphasizing the importance of the use of mobile health technology in CVD prevention/management.[2]

This year's sessions added to our armamentarium in the management of patients with HF and reduced ejection fraction. The *GALACTIC-HF* trial enrolled >8000 patients with left ventricular ejection fraction < 35% and pro-brain natriuretic peptide >400pg/mL to received Omecamtiv Mercabil vs. placebo. Omecamtiv Mecarbil treatment was associated with a modest decrease in the primary outcome, the first HF event or death from CVD causes, whichever occurred first. Furthermore, according to results of the *AFFIRM-AHF* trial involving ∼1000 patients, treatment of iron-deficient patients, who were recently hospitalized for acute HF, with periodic intravenous administration of ferric carboxymaltose modestly reduced HF readmissions over the course of 52 weeks without an effect on mortality.

Relevant clinical trial provided insights into valve and coronary artery disease treatment. The *ALPHEUS* study, which examined whether ticagrelor was superior to clopidogrel in reducing myocardial infarction (MI) type 4 in patients undergoing elective high-risk percutaneous coronary intervention (PCI), reported that ticagrelor was not superior to clopidogrel in reducing periprocedural myonecrosis. MI with non-obstructive lesions in the coronary arteries (MINOCA) is frequently observed in women[3] and the *HARP-MINOCA* study showed the usefulness of optical coherence tomography and cardiovascular magnetic resonance imaging in assessing the mechanisms underlying MINOCA, having the potential to guide medical treatment for secondary prevention. Among patients with a transient ischaemic attack or minor ischaemic strokes, those with ipsilateral atherosclerotic stenosis of cervicocranial vasculature have the highest risk of recurrent vascular events.[4] According to the double-blind *THALES* trial, in this patient's subgroup, ticagrelor added to aspirin reduced the risk of stroke or death independent of the presence of ipsilateral atherosclerotic stenosis without increasing the risk of severe bleeding.

Investigators in four trials revealed compelling clinical science contributing to the story of lipid lowering therapy on CVD prevention. The omega-3 polyunsaturated fatty acids eicosapentaenoic (EPA) and docosahexaenoic (DHA) acids, found in fish oils, have been explored as means of preventing CVD.[5] However, according to *STRENGTH* Trial, Epanova, an omega-3 carboxylic acid primarily composed of EPA and DHA, did not reduce cardiovascular events in statin-treated patients at high CVD risk. Also, in *OMEMI* trial, omega-3 fatty acid showed no benefits in elderly patients after MI. Side effects are a major reason for statin discontinuation and the *SAMSON* study revealed that their side effects are real and predominantly due to the act of taking tablets, but not the content. In an interesting study, *evinacumab*, an investigational fully humanized monoclonal antibody directed against angiopoietin-like 3 protein, reduced low-density lipoprotein

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cholesterol (LDL-C) by ∼50% in patients with refractory hypercholesterolaemia. This is relevant because treatment goals for LDL-C are often difficult to achieve in these patients.[6]

The latest clinical trial results in managing thrombosis in stents were presented. According to the *PIONEER III* study, a new biodegradable drug-eluting stent (DES), designed to promote endothelial healing, was safe and non-inferior to the standard durable polymer DES in target lesion failure. *One-Month DAPT* trial demonstrated that one month of Dual Antiplatelet Therapy (DAPT) plus aspirin after DES implantation was not inferior to the recommended 6–12 months of DAPT for a composite of cardiac outcomes and bleeding. One month therapy seemed preferential for stable PCI, whereas 6–12 months DAPT appeared preferential for patients with acute coronary syndromes (*P* for interaction = 0.013). Finally, the *RIVER* trial, an open-label study, showed that rivaroxaban is non-inferior to warfarin, which is currently the standard of care anticoagulant,[1] for prevention of thromboembolic events among patients with AF and a bioprosthetic mitral valve.

New therapy approaches in patients with chronic kidney disease (CKD) were addressed. The *FIDELIO-DKD* trial showed that finerenone, a non-steroidal selective mineralocorticoid receptor antagonist, improved kidney and cardiovascular outcomes in patients with CKD and type 2 diabetes mellitus who were on optimized renin–angiotensin system blockade. The role of sodium-glucose cotransporter (SGLT) receptors on cardiac physiology remains an attractive avenue of research.[7] Prof. Deepak Bhatt presented the *SOLOIST-WHF* and *SCORED* trial, both of which tested the dual SGLT1/SGLT2 inhibitor sotagliflozin. Sotagliflozin therapy, initiated before or shortly after discharge of patients with diabetes and recent worsening of HF, reduced cardiovascular death, hospitalizations and urgent visits for HF. The *RHAPSODY* trial showed that an interleukin 1-α and 1-β inhibitor rilonacept ($N = 30$) was superior to placebo ($N = 31$) in reducing recurrent pericarditis (6.7% rilonacept group vs. 74.2% placebo; $P < 0.0001$).

Moreover, due the complex interaction with cardiovascular function,[8] COVID-19 was also a major focus of this year's meeting. AHA COVID-19 Disease Registry reported poor clinical outcomes, including death, in black and Hispanic patients as well as young obese patients with COVID-19. A theme of this year meeting was also the call to action against structural and institutionalized racism as a fundamental driver of health disparities. From the inaugural speech to the final sessions, AHA made it a point to bring these discussions to the forefront to impact change, declaring its unequivocal support of antiracist principles.[9]

During the 2020 AHA Scientific Sessions, the results of several major studies in all fields of cardiology were presented. The virtual experience of an online conference was unique, becoming a record-breaking event. Next year, the meeting (13–15 November, Boston) will be presented in a hybrid format offering either in-person or virtual attendance.

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Biography: Rui Adão is a Biologist with a PhD degree in Cardiovascular Sciences obtained in 2019 at the Faculty of Medicine of the University of Porto (Portugal), where he currently works as a postdoctoral research scientist at the Cardiovascular Research and Development Center-UnIC. Rui Adão has a strong expertise in animal models of pulmonary arterial hypertension (e.g. monocrotaline, hypoxia-Sugen5416) and in *in vivo* and *in vitro* evaluation of cardiac function. Rui Adão has also maintained relevant collaborations with institutions of excellence in cardiovascular research and therapeutic innovation, including INSERM (France), Medical University of Graz (Austria), Christchurch School of Medicine (New Zealand), and Antwerp University (Belgium). As an early career researcher, he has won numerous prestigious scholarships and awards such as a Janssen Innovation Award (2018) and European Respiratory Society Short-Term Fellowship Grant (2017). His current research focuses on elucidating the role and therapeutic potential of novel small molecules (e.g. small peptides and microRNAs) in the setting of pulmonary arterial hypertension and associated heart failure. He is also a core member of the Scientists of Tomorrow Nucleus of the European Society of Cardiology.

Biography: Dr. Ali J. Marian received his training in clinical cardiology and human molecular genetics at Baylor College of Medicine. He is currently Professor of Cardiovascular Genetics and Medicine and Director of Center for Cardiovascular Genetic Research at The Brown Foundation Institute of Molecular Medicine at UTHSC—Houston. Dr Ali J. Marian has co-authored over 100 articles in peer-reviewed journals and he is internationally recognized for his research achievements and expertise in molecular genetics and genomics of cardiomyopathies. He is also currently an Associate Editor for *Cardiovascular Research*, Section Editor on Genetics for *Current Opinion in Cardiology*, and Section Editor on Genetics and genomics for *Current Atherosclerosis Reports*. He is a former Deputy Editor for *Circulation Research*, former Associate Editor for *Circulation*, and former Associate Editor for *European Journal of Clinical Investigation*. Dr Ali J. Marian's research is supported by grants from NHLBI-NIH, Leducq Foundation Trans-Atlantic Network of Excellence and local foundations.