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Resilience and Renewal: Charting the Future of Cardiovascular Care in a Changing World

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In this month's edition of the *European Heart Journal: Acute Cardiovascular Care*, we engage with some of the most critical issues facing contemporary acute cardiovascular medicine, including cardiogenic shock, out-of-hospital cardiac arrest, and the pressing need for sustainable practices in our healthcare systems. As we navigate these complex challenges, the insights shared by esteemed authors in this issue illuminate pathways towards improved patient outcomes and enhanced healthcare delivery.

At the forefront of this edition, Mahmoud Ismayl et al. (reference), present a nationwide study analyzing outcomes of 16,072 patients with aortic stenosis (AS) complicated by cardiogenic shock (CS) who underwent either transcatheter aortic valve replacement (TAVR) or surgical aortic valve replacement (SAVR) from 2016 to 2021. The findings reveal a notable increase in the use of TAVR, which rose from 29.5% to 46.5% during this period. Importantly, TAVR was associated with significantly lower odds of stroke ((adjusted mean(a)OR 0.59)), acute kidney injury (AKI) (aOR 0.79), and major bleeding (aOR 0.54). Although there was an increase in vascular complications (aOR 1.55), in-hospital mortality and 90-day readmissions were comparable between the two interventions. Furthermore, TAVR resulted in shorter hospital stays and reduced total costs, reinforcing its position as a viable treatment option for high-risk patients with AS complicated by CS. Ismayl's study not only highlights the increasing adoption of TAVR but also underscores the need for randomized controlled studies, which could ultimately help to refine our understanding of optimal management strategies for these patients.

Christian Jung contributes significantly to the discourse on acute myocardial infarction (AMI) and cardiogenic shock through his Bayesian reanalysis of the CULPRIT-SHOCK trial (reference). This analysis meticulously investigates the optimal revascularization strategy for patients with AMI, CS, and multivessel disease. By employing three types of priors—non-informative, skeptical, and enthusiastic—Jung's findings yield a median relative risk of 0.82, indicating a 95% probability of benefit for the culprit-lesion-only percutaneous coronary intervention (PCI) approach compared to immediate multivessel PCI. Notably, subgroup analyses reveal stronger effects among males, non-diabetic patients, and those with non-anterior STEMI. While secondary outcomes suggest potential benefits in reducing mortality and renal replacement therapy needs, the study also highlights increased risks for recurrent myocardial infarction and urgent revascularization. This nuanced understanding underscores the necessity for personalised risk-benefit assessments in clinical practice, illustrating the value of Bayesian methods in interpreting complex trial data to enhance decision-making in high-risk populations. (1)

The outcomes for survivors of out-of-hospital cardiac arrest (OHCA) are thoroughly explored by Christopher Fordyce et al (reference), who utilizes data from the British Columbia Cardiac Arrest Registry (2009-2016). Among 1,325 survivors, the study demonstrates that those with a reversible ischemic cause exhibit the highest three-year event-free survival rate of 91%, compared to only 62% for those with reversible non-ischemic causes. Multivariable analyses reveal a significantly lower risk of adverse outcomes for reversible ischemic causes (HR 0.52) and a higher risk for non-ischemic causes (HR 1.53). These findings emphasize the potential importance of identifying reversible causes in OHCA patients, suggesting that withholding implantable cardioverter-defibrillator (ICD) implantation in reversible ischemic cases is safe. Conversely, heightened attention is warranted for patients with non-ischemic causes.

Fordyce's research not only sheds light on the long-term outcomes of OHCA survivors but also calls for a more refined approach to their management.

In a comprehensive analysis of the epidemiology of cardiogenic shock (CS) within a cardiac intensive care unit (CICU) setting, David Berg et al (reference) utilizes the Shock Academic Research Consortium (SHARC) definitions to classify distinct patient populations. The study includes data from 8,974 patients meeting CS criteria from 2017 to 2023 and the authors report that 65% had isolated CS and 17% had mixed shock. Among the 5,869 patients diagnosed with CS, 27% had acute myocardial infarction-related CS (AMI-CS), 59% had heart failure-related CS (HF-CS), and 14% had secondary CS. The in-hospital mortality rates varied significantly, with mixed CS exhibiting the highest mortality at 48%, followed by AMI-CS at 41%. Berg's study highlights the utility of SHARC definitions in identifying distinct CS subpopulations with varying clinical outcomes, ultimately informing clinical practice and future research directions.

The risk of sudden cardiac death (SCD) following early-onset myocardial infarction (MI) is explored by Serena Bricoli (reference) who leverages a large cohort of 2,000 patients under the age of 45 and followed for a median of 19.9 years. Among these patients, 195 experienced SCD, with higher occurrences in males who were hypertensive, diabetic, and had a history of thromboembolic events. Key independent predictors identified through multivariable analysis include diabetes, hypertension, previous thromboembolic events, a high Syntax score, and a lower left ventricular ejection fraction (LVEF) post-MI. Notably, SCD often emerged as the first clinical event after MI, highlighting the significant risk it poses to this population, potentially linked to progressive coronary atherosclerosis. Bricoli's findings underscore the need for proactive monitoring and targeted interventions for individuals at risk.

Amidst these critical advancements in cardiovascular care, we must also address the looming threat of climate change, which poses unprecedented challenges to health systems worldwide. In their pivotal work, "Crisis at the Heart: Unraveling the Unseen Threat – Climate Change's Provocative Impact on Acute Cardiac and Critical Care," Munzel et al. (reference) highlight how the accelerating climate emergency exacerbates cardiovascular risks, intensifying acute cardiac events and straining critical care resources. The authors call for urgent global adaptation and preparedness within healthcare systems to mitigate the adverse effects of climate change on cardiovascular health. This urgent message serves as a clarion call for healthcare professionals to integrate sustainability into their practice.

We also invite our readers to explore this month's statistical spotlight, which delves into best practices and clinical guidance in extension studies for revascularization in left main coronary artery disease. Understanding the intricacies of statistical analysis not only enhances the quality of clinical research but also informs evidence-based practice, ultimately driving improvements in patient care.

Together, let us advance our understanding and practice in cardiovascular care, paving the way for better outcomes in an increasingly complex world.

Enjoy!

Pascal Vranckx, David Morrow, Sean van Diepen, Frederik Verbrugge editors.

References

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