



Best Paper of the Year 2023

Craig Stolen¹ · Enrique Lara-Pezzi^{2,3}

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As every year [1, 2], we highlight the best papers of the last year in JCTR. In 2023, there were several relevant and exciting manuscripts published in our Journal. Among these, the associate editors felt the following papers stood out based on their novelty, scientific rigor, and translational impact. We believe that they showcase the quality and diversity of the papers published in JCTR.

Best Paper of the Year

Urinary marker profiles in heart failure with reduced versus preserved ejection fraction, by Koen W. Streng and colleagues [3]

In the past decade, advancements in biomarker research have significantly enhanced our understanding of heart failure with preserved and reduced ejection fraction (HFpEF and HFrEF), paving the way to the development of more targeted treatment strategies for these patients [4]. While markers of renal dysfunction are common in both HFrEF and HFpEF, the underlying etiologies of impairment may differ.

The “Urinary Marker Profiles in Heart Failure with Reduced Versus Preserved Ejection Fraction” paper [3], voted best of 2023 by JCTR editors, explores these potential differences by looking at renal biomarkers in 2070 HFpEF and HFrEF patients from the BIOSTAT-CHF study, analyzing 10 established and emerging urinary markers reflecting different nephron segments. This comprehensive

methodology facilitated a nuanced exploration of renal pathophysiology revealing discernible differences. Although most patients experienced renal dysfunction attributable to a prerenal cause, a significantly higher incidence of intrinsic renal dysfunction was observed in the HFpEF patients. This led the authors to propose that there is a greater influence of endothelial dysfunction and inflammation on the development of renal issues for this group. Moreover, HFpEF patients exhibited more changes in urinary markers, across almost all nephron segments, compared to HFrEF patients. Notably, elevated levels of proximal tubular damage markers, urinary KIM-1 and urinary NGAL, were found in HFpEF patients, with the most pronounced differences observed in those with normal renal function (eGFR > 60 ml/min/1.73 m²). Intriguingly, this suggests higher prevalence of renal dysfunction in HFpEF patients even when glomerular function remains preserved. The identification of distinct biomarker signatures throughout the entire renal continuum, with particular in differences found in HFpEF patients, could facilitate more accurate and earlier diagnosis of these conditions, as well as open avenues for preventative measures and tailored therapeutic strategies.

Highly Commended Papers in JCTR in 2023

Enhanced levels of adiposity, stretch and fibrosis markers in patients with coexistent heart failure and atrial fibrillation, by Xiaoran Fu and colleagues [5]

This study sought to determine whether compounds derived from blood, epicardial fat, and subdermal fat could serve as biomarkers for heart failure (HF), atrial fibrillation (AF), and a combination of both. The changes in the levels of biomarkers related to myocardial remodelling and fibrosis in patients with coexistent HF and AF not only suggest an association with the progression of cardiovascular disease (from adiposity to fibrosis), but may hold translational value for prognoses as well as directing clinical care.

✉ Craig Stolen
craig.stolen@bsci.com

¹ Cardiac Rhythm Management, Boston Scientific Corporation, Saint Paul, MN 55112, USA

² Centro Nacional de Investigaciones Cardiovasculares (CNIC), Madrid, Spain

³ Centro de Investigación Biomédica en Red Cardiovascular (CIBERCV), Madrid, Spain

A Novel Quantitative Electrocardiography Strategy Reveals the Electroinhibitory Effect of Tamoxifen on the Mouse Heart by Ming Xie and colleagues [6]

Tamoxifen is widely used to treat and prevent breast cancer. Moreover, in preclinical research, it is used extensively to induce conditional gene targeting and reporting, with little consideration to the potential side effects, albeit cardiac fibrosis and hypertrophy have been associated with certain tamoxifen-inducible cardiac Cre drivers. Using a highly sensitive ECG method and an innovative mathematical reconstruction strategy, the authors found that tamoxifen suppressed atrial depolarization and early ventricular depolarization, resulting in a decreased heart rate and increased frequency of atrioventricular block, which may be proarrhythmic. Interestingly, altered electrical activity was found to be dose-dependent. This paper highlights the importance of monitoring cardiac function in cancer patients undergoing tamoxifen treatment and the need for a rigorous approach to the design and interpretation of acute cardiac function or survival in murine studies.

The Fragmented QRS Complex in Lead V1: Time for an Update of the Athlete's ECG? by Marco Vecchiato and colleagues [7]

This study addresses a current issue in the field of sports cardiology, namely the challenge of distinguishing electrocardiographic (ECG) patterns associated with physiological heart remodelling in athletes from pathological findings. The presence and significance of a fragmented QRS complex (fQRS) have been subject to debate in patients as well as in athletes. Recent evidence described the presence of fQRS in the lead V1 (fQRSV1) as a frequent ECG pattern in apparently healthy young adult athletes and associated with training-induced right ventricle remodelling. Nevertheless, there are limited data on the pediatric population and the association with arrhythmic risk. The study evaluated the presence of fQRSV1 among children and adolescent athletes and examined its correlation with training-induced functional and structural heart adaptations and exercise-induced arrhythmias. They found that the high prevalence of fQRSV1 in young athletes is associated with training-induced heart adaptations but not with exercise-induced ventricular arrhythmias.

The trouble with trabeculation: how genetics can help to unravel a complex and controversial phenotype by Roddy Walsh [8]

This well-crafted review provided deep insight and an impactful genetic perspective of a complex topic. The extent to which hypertrabeculation of the left ventricle is a pathological or physiological process and whether left ventricular non-compaction (LVNC) cardiomyopathy exists as a distinct disease entity remains a controversial issue in cardiology practice and research. Genetics research can help to investigate these issues and there has been considerable progress in this field in recent years. This article focused on three recently published meta-analyses of LVNC genetics using different methodologies and the insights they yielded. The article also described the outstanding issues and future areas of research needed to deepen our understanding of LVNC genetics.

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