Preface

Sudden Cardiac Death: Contemporary Challenges

Mohammad Shenasa, MD

N.A. Mark Estes III, MD

Editors

Gordon F. Tomaselli, MD

Despite the decline in mortality due to coronary artery disease over the last three decades, sudden cardiac death (SCD) remains a major health problem, claiming 250,000 to 300,000 lives annually in the United States. The annual incidence of SCD in Europe is similar to the United States, ranging from 50 to 100 per 100,000 in the general population. The overall survival rate remains poor, with only approximately 10% of individuals who experience a cardiac arrest surviving. Early defibrillation by an automated external defibrillator (AED) improves outcomes from cardiac arrest with survival rates to over 50% in some public locations. However, the majority of cardiac arrests occur in victim's homes, where AEDs have not improved survival. Based on these considerations, it is evident that identifying strategies for prediction and prevention of SCD represents an important public health priority.

Asymptomatic individuals without markers of high risk for cardiac arrest account for the majority of SCDs. Despite multiple advances in the strategies for SCD risk stratification, the current available techniques have limitations related to sensitivity, specificity, and cost-effectiveness. The goal of developing effective, low-cost, and noninvasive risk stratification tools for SCD remains elusive. While novel genetic and biological indicators of risk for SCD are being investigated, none have been integrated into clinical trials with interventions that improve overall survival.

Left ventricular ejection fraction (LVEF) remains the primary risk-stratification technique despite

many limitations. Multiple prospective randomized clinical trials have shown reduction in arrhythmic death and total mortality when the patient's prior cardiac arrest is treated with implantable cardioverter-defibrillator (ICD) therapy for secondary prevention. In patients with impaired LVEF with prior myocardial infarction or dilated cardiomyopathies, pharmacologic therapy and ICDs have also been demonstrated to improve overall survival when used for primary prevention of SCD. Patients with heart failure with preserved ejection fraction represent a growing proportion of patients experiencing SCD. Risk stratification techniques and interventions that reduce arrhythmic death and improve overall mortality are being investigated.

With this background of an ongoing major public health problem of SCD and limitations of current strategies improving outcomes from cardiac arrest, we have elected to serve as editors of this issue to provide the reader with the best available science related to this important topic. In doing so, we have invited a multidisciplinary team of contributors with expertise in basic, translational, clinical, and population science. Each article not only provides a summary of the best available evidence related to sudden death, but also identifies critical knowledge gaps. Authors have also identified future research that will address these gaps and improve prediction and prevention of sudden death and patient survival.

As editors, we are grateful to the authors for providing a contemporary review of the best available science related to SCD. We also thank the

Elsevier staff for their guidance and professionalism. We are confident that this issue will give all who provide care to patients with cardiovascular disease the most up-to-date knowledge related to mechanisms and clinical strategies for prediction and prevention of SCD.

The Editors

Mohammad Shenasa, MD
Heart and Rhythm Medical Group
Department of Cardiovascular Services
O'Connor Hospital
San Jose, CA 95128, USA

N.A. Mark Estes III, MD
Tufts University School of Medicine
New England Cardiac Arrhythmia Center
Tufts Medical Center
Boston, MA 02111, USA

Gordon F. Tomaselli, MD
Johns Hopkins School of Medicine
Baltimore, MD 21287, USA

E-mail addresses:

mohammad.shenasa@gmail.com (M. Shenasa)
nestes@tuftsmedicalcenter.org (N.A.M. Estes)
gtomasel@jhmi.edu (G.F. Tomaselli)