Channelling regional registries for optimization of cardiac care: lessons from around the world

Hitinder S. Gurm* and Kim A. Eagle

University of Michigan Cardiovascular Center, 2A394, 1500 E. Medical Center Drive, Ann Arbor, MI 48109-5853, USA

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This editorial refers to ‘Presentation, management, and outcomes of 25 748 acute coronary syndrome admissions in Kerala, India: results from the Kerala ACS Registry†, by P.P. Mohanan et al., on page 121

The epidemiology of cardiac disease is undergoing a steady transformation, with a small but steady decline in cardiac mortality in the western world while the prevalence and impact of coronary artery disease (CAD) continue to increase in middle income and low income countries. This is especially true in south Asia where CAD often manifests at an early age with profound societal and economic implications.2

Mohanan and colleagues now describe the results of the Kerala ACS Registry.3 Kerala, a picturesque state in south India, has some of the best health statistics in the Indian subcontinent, with high life expectancy, low infant mortality, and high literacy. It, however, has not been immune to the increasing incidence and prevalence of CAD that has accompanied India’s economic transformation.4 The Kerala Chapter of the Cardiological Society of India is to be applauded for developing this collaborative registry to study the quality of care and outcomes associated with acute coronary syndromes (ACS). The investigators identified 185 hospitals in the state that provided care to patients with ACS and, of these, 125 hospitals submitted data to the registry. The registry enrolled patients at teaching institutions, private as well as government hospitals, and a sizeable number of rural hospitals (40%), thus increasing the generalizability of their findings. Fewer than a quarter of the institutions (22%) had a cardiac catheterization laboratory on site, while 58% had a cardiologist on staff. The patients enrolled in the study were more likely to be younger and to present with ST-elevation myocardial infarction (STEMI) compared with those in the registry data from developed countries. The use of lipid-lowering treatments, beta-blockers, and angiotensin-converting enzyme inhibitors was low, and few patients had an invasive approach with coronary revascularization (Figure 1). Thrombolytic therapy was underused in STEMI and inappropriately administered to 19% of patients with non-STEMI and 11% of those with unstable angina. Not surprisingly, the inappropriate use of thrombolytic therapy was associated with an increased risk of complications and a trend towards increased mortality.

These findings are important for many reasons. This registry is a comprehensive attempt to study ACS in a homogenous region in India and helps identify opportunities for improvement in care. Cardiac registries have been at the forefront of implementing science and now serve as the paradigm for translating the evidence base to evidence-based practice. Multiple studies have demonstrated an association between better processes of care and clinical outcome in patients with ACS. Peterson and colleagues demonstrated a robust association between mortality and hospital adherence to Class I American College of Cardiology (ACC)/American Heart Association (AHA)-recommended therapies among patients with non-ST elevation ACS, with a 10% decline in in-hospital mortality for every 10% increase in adherence to a composite of nine proven therapeutic strategies.5 More recently, Jernberg and colleagues evaluated the trends in treatment and outcome of patients presenting with STEMI in Sweden between 1996 and 2007 and demonstrated a remarkable uptake in use of evidence-based therapies and a parallel decline in early as well as 1-year mortality.6

Registries not only serve to identify the lacunae in care but can be used to develop and deliver simple tools that can help overcome these. The ‘Guidelines Applied in Practice’ project was a statewide effort in Michigan to embed the best care practices into a standardized admission and discharge template across multiple participating institutions. This resulted in a dramatic uptake of evidence-based therapy both during hospitalization and post-discharge. Most importantly, this was associated with a reduction in mortality at 30 days and 1 year.7

The benefit of optimizing use of evidence-based therapies and reducing the use of unproven therapies cannot be overstated. Collection of data is the first step in the process of understanding the gaps in care, and needs to be followed by measures to bridge these gaps, combined with ongoing audit and data collection so that the quality improvement effort can be reshaped to a changing target (Figure 2).
This registry is a major milestone in both understanding the epidemiology of ACS in Kerala and identifying opportunities for improvement in care. The results of the registry should result in a two-pronged quality improvement initiative, the first focused on prevention of ACS and the second on better treatment. The investigators had been uncannily prescient in their concerns about the changing risk factor profile and the burden of cardiovascular disease as they launched this project.

Tobacco use, dyslipidaemia, and hypertension are the main determinants of population-attributable risk worldwide, and remain so in this population.

Tobacco use is expected to cause 10% of deaths worldwide by 2015, and efforts to curb its use might be the most effective public health measure to affect cardiovascular health. The incidence of myocardial infarction after initiation of antismoking regulations falls quickly, and benefits both smokers and non-smokers. A decline in smoking has been mainly driven by punitive taxation policies in developed countries, and patients often cite the rising cost of tobacco products as a reason for quitting tobacco. This is especially relevant for a country such as India where tobacco use is more prevalent in the poor sections of society and is increasing among the youth across the entire socio-economic spectrum.

Similarly, focused governmental policy and health education can affect lifestyle and risk factor profiles, and these efforts have been successfully applied in low income countries. Even a modest change from saturated to polyunsaturated fat can achieve dramatic reductions in cardiovascular mortality, as has been evident in Poland. Likewise, improved screening and control of hypertension and hyperlipidaemia would have major salutary benefits in the reduction of the burden of cardiovascular disease across the Indian subcontinent with the low cost of generic medications or with strategies such as the polypill.

The second challenge would be to ensure optimum treatment of patients when they present with ACS. This can appear challenging in a resource-poor environment, especially where the cost of care has to be entirely borne by the patient. However, most of the pharmacotherapeutic agents proven to reduce mortality and morbidity in ACS are available as generics and can be offered to patients at low cost. Appropriate widespread use of these drugs during and after hospitalization is believed to be the key factor behind the improved outcomes in patients with ACS observed in developed countries, and should be easy to apply in low and middle income countries. The key factors responsible for the decline in coronary mortality in the USA are believed to be improvement in risk factor profiles, and effective primary and secondary treatments of ACS. High-tech and expensive therapies such as revascularization account for only 5% of this improvement in survival, suggesting that community-wide risk factor control and wider use of appropriate medical therapy should be explored as first-line strategies to achieve a similar reduction in coronary mortality worldwide.

Recently, Berwanger and colleagues demonstrated the feasibility of a systems-wide approach in optimizing ACS care across 34 hospitals in Brazil. They used a randomized approach to assess the impact of an intensive multifaceted quality improvement strategy.

**Figure 1** The acute coronary syndrome quality benchmarks in patients enrolled in the Kerala ACS Registry. ASA, aspirin; STEMI, ST-elevation myocardial infarction.

**Figure 2** A schematic depicting the ongoing quality improvement cycle of regional collaboratives. Data are collected and used to identify gaps in care processes, quality improvement efforts are developed to bridge these gaps, the resultant improvements in care are quantified, and the lessons learnt are then shared across the network. This is followed by refinement of quality goals, and the cycle repeats itself.
This included use of reminders, case management checklists and tools, and intensive education of clinicians. There was an increase in use of dual antiplatelet therapy (75% vs. 89%), statins (73% vs. 83%), and anticoagulant therapy (81% vs. 87%) during hospitalization, and the overall adherence to all acute and discharge therapies increased from 32% to 51%. The lessons from this study can be easily applied across other middle and low income countries and should serve as a blueprint for quality improvement efforts across the globe.

The regional nature of the Kerala Registry limits generalization of the findings to other parts of the world or even to other parts of India, but it also makes it more likely to be successful in translating these findings into actionable goals. Our experience with the Blue Cross Blue Shield of Michigan Cardiovascular Collaborative (BMC2) has taught us to value the close collaboration between physician champions that is fostered by the regional nature of the collaborative and the ease with which data can be used to guide quality improvement efforts. This collaboration has helped reduce variation in practice across the entire state, reduced average contrast dose, increased use of appropriate antiplatelet therapy and hydration prior to the procedure, and demonstrated improvement in clinical outcomes such as contrast-induced nephropathy, vascular complications, and post-procedural myocardial infarction. These efforts have been replicated in multiple disciplines and have consistently resulted in improved outcomes and cost savings. The regional nature of the Kerala ACS Registry should serve to facilitate easy dialogue, nurture an open discussion of quality goals, and foster local championship of quality issues. The learning network and collaboration that is implicit in regional registries distinguishes them from national registries and also highlights the core strength that makes these local collaboratives a major quality driver.

Mohanan and colleagues are to be commended for defining the challenges pertinent to the treatment of ACS in Kerala. In initiating this registry, they outlined the challenges facing the local cardiiology community and have established a snap-shot of the current state of the ACS care across their state. The next obvious step is to define and implement improved measures for primary prevention and more evidence-based treatment of ACS.

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References