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Editorial

A data driven approach for optimizing cardiac care: Acute coronary syndromes and beyond

Acute coronary syndromes (ACS) are the most important manifestation of CAD, both due to their high incidence and the associated high mortality and morbidity. ACS has been extensively studied in the western world and almost all the therapies that are used in the contemporary treatment of ACS were developed and validated in North America and Europe and have been studied in a limited fashion in the Indian context. While it is unlikely that the pathophysiology of plaque instability and the resultant atherothrombosis differ across the globe in an average patient, the care and outcome of patients with any illness are strongly impacted by local cultural, economic, and societal norms. This makes it vital that we continuously examine the treatment and outcome of common conditions such as ACS in the Indian context to define how their epidemiology is evolving and to guide development of impactful interventions.

The current issue of the journal carries two articles on ACS and both highlight noteworthy achievements and identify important next steps. In the first study, Dr Iqbal and Dr Barkataki describe the presentation, care, and outcome of 704 patients, who presented to Gauhati Medical College. The majority of the patients presented with STEMI (72%), and the mean delay to presentation was 11 h (~10 h for STEMI patients). Fibrinolytics were used in 39% of the patients with STEMI and the commonest reason for not getting thrombolytic therapy was delayed presentation. The 30-day mortality was just above 10% and pump failure was responsible for about half of the deaths. Dual anti-platelet therapy (DAPT), and statin use was nearly universal, while beta-blockers and Angiotensin converting enzyme inhibitors (ACEI) or angiotensin receptor blockers (ARB) were used in over 90% of the patients.

The second study describes the results of the Himachal Pradesh ACS registry. This is a collaborative effort involving 33 hospitals that between them treat over 90% of patients presenting with ACS in the entire state. In this study, the proportion of NSTEMI ACS was higher (55%) and overwhelming majority of patients were rural dwellers (83%). The median delay to presentation was 13 h and was similar in the STEMI and NSTEMI patients. Less than a third of patients reached the hospital within 6 h and fibrinolysis was used in only 36% of patients with STEMI. The use of DAPT and statins was nearly universal, while the beta blocker and ACEI/ARB use was somewhat less optimal. The mortality of the STEMI cohort was approximately 10%.

These studies provide an important insight into the epidemiology of ACS in India. The most important initial attempt at understanding ACS in India is represented by the CREATE registry.[1] This registry enrolled 20,937 ACS patients across 89 centers in 50 cities. STEMI patients comprised the majority (61%). One of the most noteworthy finding was that poor patients did much worse than rich patients (mortality 8.2% vs 5.5%), and this difference was accounted for by difference in treatment. Rich patients were more likely to receive thrombolytics (60.6% vs 52.3%), β blockers (58.8% vs 49.6%), lipid-lowering drugs (61.2% vs 36.0%), ACE inhibitors or ARB (63.2% vs 54.1%), percutaneous coronary intervention (15.3% vs 2.0%), and coronary artery bypass graft surgery (7.5% vs 0.7%) compared with poor patients. While the differences in use of more expensive therapies such as PCI and CABG is understandable in a predominantly self-pay environment, the differences in the use of inexpensive pharmacotherapy suggest that these differences might relate to institutional factors. It has been previously recognized that care practices vary at hospitals that provide care to socio-economically disadvantaged patients and the existence of such clustering also makes it easier to target quality improvement efforts at the institutional level.[2]

The CREATE registry, while exceedingly important, is only a partial snapshot of ACS in India. It was derived from predominantly urban tertiary care centers and thus did not take into account the even more marked heterogeneity in care across different hospitals in India. Another important milestone in study of ACS in India is the ongoing Kerala ACS Registry.[3] This effort by the Kerala Chapter of the Cardiological Society of India to study the quality of care and outcomes associated with ACS included data from 125 of the 185 hospitals in Kerala that provided care to patients with ACS. These included 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. 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 toward increased mortality. On the positive side, use of optimal medical therapy was associated with reduction in mortality and morbidity.[4]

In this context, what is the added value of the two publications in the current issue of the journal? Firstly, the incredible diversity of India means that the challenges of delivering high quality care are going to be both similar and different across different regions. Cardiac registries have been the pioneers of implementation science and extraordinarily effective at translating the evidence base to evidence-based practice. The association between better processes of care and clinical outcome in patients with ACS is well recognized. There is a strong 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] Similarly, a study from Sweden evaluated the trends in treatment and outcome of patients presenting with STEMI and demonstrated a remarkable uptake in use of evidence-based therapies and a parallel decline in early as well as 1-year mortality.[6]

Quality improvement systems generally evolve as defined in Fig. 1. The work by Iqbal and Barkataki represents the first two steps in this cycle. The investigators should take the next step and develop a local network of hospitals that can compare care processes and assess outcomes across the entire North-Eastern region. The Himachal ACS registry on the other hand is now in a position not only to define the lacunae in care but can be used also to develop and deliver simple tools that can help overcome these.

Prior experience suggests that such efforts can be remarkably successful. The 'Guidelines Applied in Practice' project was a multi-institutional statewide effort in Michigan, USA to embed the best care practices into a standardized admission and discharge templates across the participating institutions. This resulted in an immediate improvement in the utilization of evidence-based therapy both during hospitalization and post-discharge along with an associated reduction in mortality at 30 days and 1 year.[7]

The need for of optimizing use of evidence-based therapies and reducing the use of unproven therapies cannot be overstated. The first step in the process of understanding the gaps in care is collection of data, and this needs to be followed by measures to critically understand the reasons for these gaps and to rectify them. This has to be combined with ongoing audit and data collection, so that the quality improvement effort can be reshaped to a changing target (Fig. 2).

As a first step the organic growth of studies assessing processes of care and outcomes of ACS is a welcome sign of maturity of the Indian healthcare market. As different registries emerge, it would behoove the national cardiology leadership to create a national data collection system akin to the American College of Cardiology lead National Cardiovascular Data registry (NCDR) but with the ability to permit and even encourage local efforts at data collection and quality improvement. The strength of the Indian software industry combined with the natural Juggad entrepreneurship skills and the experience of the Indian Diaspora create a formula for success that can match and exceed what has been achieved elsewhere.

In recognition of the diversity that we Indians love to celebrate, it would be important to encourage both local and national registries in parallel and ensure that national registries foster the growth of local sub-registries. These regional registries serve as learning networks and this helps drive quality improvement. The success of the Kerala Registry was in part related to its local roots and connections that facilitated close collaboration and made the registry successful in translating these findings into actionable goals. In our work with the Blue Cross Blue Shield of Michigan Cardiovascular Collaborative (BMC2), I have long recognized the value of

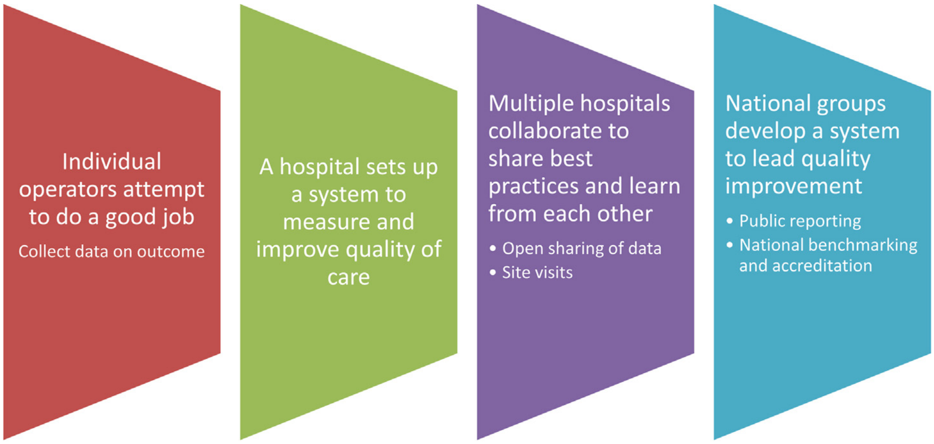

Fig. 1 – The evolution of health care quality.