



Beyond D2B times: critical, global issues in STEMI interventions

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KEYWORDS: door-to-balloon times ■ global STEMI interventions ■ pharmacoinvasive management

"In matters of conscience, the opinion of the majority does not matter"

Mahatma Gandhi

Not only has this dictum been my guiding principle for almost a decade, it has global relevance in ST-elevation myocardial infarction (STEMI) interventions [1,2]. After all, should it not bother the conscience of cardiologist globally, that young adults are dying from an eminently curable disease – acute myocardial infarction (AMI)? They are perishing from an ailment that takes an interventional cardiologist approximately 15 min to abort and definitively treat. With better access, effective anticoagulation, thrombectomy strategies and newer stents, this extraordinary procedure, probably the finest indication of percutaneous coronary intervention (PCI), restores left ventricular function, facilitates very early hospital discharge, dramatically reduces morbidity and mortality and results in gargantuan healthcare savings [3–8]. Beyond some genuine logistical constraints and inadequate resources, cardiologists are simply not heeding to their conscience call and jumping out of their bed to perform these remarkable procedures.

In pointing out critical global issues in STEMI care, I refer to my own inimitable journey with STEMI interventions. It began almost a decade ago, when I abandoned elective PCI to live the challenging life of a STEMI interventionist. In embarking, against all odds, upon this deeply humbling voyage, I listened to my conscience, exactly as Mahatma Gandhi entreats us. Through this remarkable journey, I have discovered the consummate privilege of saving precious lives. The Single Individual Community Experience Registry (SINCERE) recently enrolled its 1000th consecutive short door-to-balloon (D2B) STEMI patient. This experience taught me numerous lessons and highlighted the 'process' and 'procedure' challenges of STEMI

interventions. I am presently involved in disseminating these edifices globally and have been developing numerous population-based AMI programs. This year alone, I have performed D2B interventions in the USA, India, China and Puerto Rico, and have had the dispensation of collaborating with some of the world's best interventional cardiologists. Observations that I share herewith, first and foremost, recognize the intellect and skills of several of these outstanding colleagues.

In Europe and North America, D2B interventions no longer present formidable logistical challenges. Almost entirely, D2B times <90 min are being achieved. This has resulted from reliable prehospital activation and from team work [9]. The Joint Commission on Accreditation of Healthcare Organizations mandates, financial incentives and legal threats have also contributed to the improvements. However, D2B times may be an oversimplification for providing optimal STEMI care. They may be a wrong metric, a pseudo-scientific measure that is prone to manipulation and criticism. Worse, it may even have unintended consequences. Beyond these fundamental flaws, achieving D2B time simply represents the low hanging fruit of STEMI interventions; the larger challenges include patient education and legislation [1]. In the USA, a disproportionate number of patients self-transport [10]. This delays diagnosis and treatment, and can lead to adverse outcomes. Patient education, as lauded by the superb American Heart Association initiatives of Mission Lifeline, is critical for patients hastening to seek care and using ambulance services. Legislation will facilitate hospital bypass and improve interhospital transfers and prevent the nascent practice of 'dumping' STEMI patients. Finally, reimbursements to physicians need to be streamlined, in the midst of their providing life saving care to a burgeoning number of uninsured STEMI patients.



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Pharmacoinvasive management will be the supreme management strategy for delivering AMI care for the behemoth Chinese and Indian population and for patients in Africa, the Middle and Far East. These countries simply lack the sophisticated ambulance services and resources that enable Primary PCI/D2B interventions. Catheterization laboratories are few, patients present to small community hospitals and clinics, and transportation remains slow and unpredictable. Large segments of vulnerable populations do not even receive prompt thrombolytic therapy and often the timely diagnosis of AMI is missed.

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SUPPLEMENTARY TABLE 1 outlines a proposed, 4-phase strategy recommended to covenant the massive, underprivileged populations in poor countries that are burdened with the extreme challenge of providing care for millions of vulnerable patients. This AMI public health recommendation incorporates basic AMI care, administration of early thrombolytic therapy and progression to primary PCI through gradual development of ambulance services. It also designates the expected time interval that will be needed to develop such nationwide care and approximates the lives saved from adopting these strategies.

STEMI guidelines developed in USA and western hemisphere appear increasingly irrelevant for providing prudent care to the millions

of poor patients. As a specific example, the basic tenet of the mandatory invasive component that follows administration of thrombolysis is fundamentally flawed, as it ignores economic realities. In poor countries, science must be balanced with fiscal prudence to benefit the masses. It is my firm belief, based upon my extensive global STEMI exposure, that India and China will lead cost-effective pharmacoinvasive management in the next decade. Patients who receive thrombolytic therapy fall into four categories based upon their clinical and financial status. Each group is managed differently with indigenous strategies that defer invasive management for clinically stable patients who lack financial resources.

SUPPLEMENTARY TABLE 2 provides an algorithm that depicts this pragmatic approach.

Much progress has been made in primary PCI. However, this evolution eludes the vulnerable patient in poor countries where innovative strategies require further exploration.

Supplementary data

Supplementary data accompanies this paper and can be found at WWW.FUTURE-MEDICINE.COM/DOI/FULL/10.2217/ICA.11.93

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