

Acute Coronary Syndrome Management in Bangladesh: Bridging Gaps in Timely Diagnosis, Evidence-Based Treatment, and Equitable Access

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Acute coronary syndrome (ACS), encompassing ST-segment elevation myocardial infarction (STEMI), non-ST-segment elevation myocardial infarction (NSTEMI), and unstable angina, remains one of the leading causes of mortality and disability worldwide. Bangladesh, like many low- and middle-income countries (LMICs), is experiencing a rapid epidemiological transition characterized by a growing burden of non-communicable diseases, particularly cardiovascular diseases. Urbanization, population aging, diabetes mellitus, hypertension, tobacco use, obesity, and sedentary lifestyles have contributed to an alarming increase in ACS incidence. Despite remarkable advances in diagnosis and treatment globally, many Bangladeshi patients continue to experience preventable morbidity and mortality due to delays in diagnosis, limited access to evidence-based therapies, and inequities within the healthcare system.

The management of ACS is fundamentally time-sensitive. The concept that "time is muscle" underscores the importance of rapid recognition and prompt reperfusion therapy, particularly for STEMI. Unfortunately, delayed presentation remains one of the greatest barriers in Bangladesh. Poor public awareness of myocardial infarction symptoms, self-medication, consultation with unqualified healthcare providers, financial concerns, and transportation challenges frequently prolong the interval between symptom onset and first medical contact. Consequently, many patients arrive at tertiary hospitals well beyond the recommended therapeutic window for primary percutaneous coronary intervention (PCI) or fibrinolysis, substantially reducing the benefits of reperfusion therapy.

Healthcare infrastructure further compounds these challenges. While Bangladesh has developed several centers capable of performing primary PCI, these facilities

are concentrated mainly in Dhaka and a few metropolitan cities. Rural populations, which constitute a large proportion of the country's inhabitants, often lack timely access to specialized cardiac services. Most district and sub-district hospitals have limited catheterization laboratory facilities, inconsistent availability of cardiac biomarkers, and shortages of trained cardiologists and emergency physicians. As a result, referral delays remain common, diminishing the effectiveness of modern ACS management.

Timely diagnosis requires not only clinical suspicion but also reliable diagnostic tools. Electrocardiography (ECG) should be performed within 10 minutes of first medical contact for patients presenting with chest pain, while high-sensitivity cardiac troponin assays have become the cornerstone for diagnosing myocardial infarction. However, many peripheral healthcare facilities continue to rely on conventional biomarkers or lack rapid laboratory services altogether. Expanding access to standardized ECG interpretation, point-of-care troponin testing, and telecardiology networks could substantially improve early diagnosis and expedite referral decisions.

Bangladesh has made encouraging progress in adopting international evidence-based guidelines, yet implementation remains inconsistent. Guideline-directed medical therapy—including dual antiplatelet therapy, anticoagulation, statins, beta-blockers, angiotensin-converting enzyme inhibitors, and timely reperfusion—should be universally accessible. However, disparities in medication availability, affordability, physician adherence, and patient compliance persist across healthcare settings. Establishing standardized national ACS treatment pathways, supported by continuous professional education and clinical audit systems, would help reduce unwarranted variations in care.

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Financial barriers continue to limit equitable access to optimal treatment. Primary PCI, although the preferred reperfusion strategy for STEMI, remains unaffordable for many patients because of substantial out-of-pocket healthcare expenditures. Even when catheterization laboratories are available, treatment costs may delay decision-making or compel families to choose less effective alternatives. Expanding health insurance coverage, strengthening public financing mechanisms, and subsidizing life-saving cardiovascular interventions should become national priorities. Ensuring uninterrupted availability of essential cardiovascular medicines at public hospitals would further reduce inequalities in treatment access.

Strengthening emergency medical services (EMS) represents another critical opportunity. Bangladesh lacks a coordinated prehospital cardiac care system capable of providing early ECG acquisition, prehospital diagnosis, and direct transportation to PCI-capable hospitals. International experience has consistently demonstrated that integrated STEMI networks, supported by ambulance-based ECG transmission and streamlined referral pathways, significantly reduce door-to-balloon times and improve survival. Developing similar regional STEMI networks adapted to the Bangladeshi healthcare context could transform ACS outcomes. Equally important is investment in prevention. Most ACS risk factors are modifiable, making primary prevention a cost-effective strategy for reducing disease burden.

Comprehensive tobacco control policies, promotion of healthy diets and physical activity, improved hypertension and diabetes management, and community-based

cardiovascular risk screening should be integrated into national non-communicable disease programs. Public education campaigns emphasizing early recognition of chest pain and the importance of seeking immediate medical attention could substantially reduce prehospital delays. instrumental in generating locally relevant evidence and implementing sustainable quality improvement programs.

Bangladesh stands at a pivotal moment in cardiovascular care. The country's expanding cardiac services, growing clinical expertise, and increasing awareness of evidence-based medicine provide a strong foundation for progress. Nevertheless, meaningful improvements in ACS outcomes will require coordinated action that extends beyond tertiary hospitals. Investments in public awareness, emergency medical systems, equitable access to diagnostics and reperfusion therapy, affordable healthcare financing, workforce development, and national quality improvement initiatives are urgently needed. Bridging these gaps will not only reduce preventable deaths but also strengthen Bangladesh's capacity to address the growing epidemic of cardiovascular disease. Ensuring timely diagnosis, evidence-based treatment, and equitable access to care should become a national commitment, transforming ACS management from a challenge into an opportunity for improving cardiovascular health across the country.

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