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Original Article

Pre-hospital acute coronary syndrome care in Kerala, India: A qualitative analysis

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ABSTRACT

Objective: Ischemic heart disease is the leading cause of death in India. Many of these deaths are due to acute coronary syndromes (ACS), which require prompt symptom recognition, care-seeking behavior, and transport to a treatment facility in the critical pre-hospital period. In India, little is known about pre-hospital management of individuals with ACS. We aim to understand the facilitators, barriers, and context of optimal pre-hospital ACS care to provide opportunities to reduce pre-hospital delays and improve acute cardiovascular care.

Methods and results: We conducted a qualitative study using in-depth interviews and focus group discussions with 27 ACS providers in Kerala, India to understand facilitators, barriers, and context to pre-hospital ACS care. Six themes emerged from these interviews and discussions: (1) individuals with ACS misperceive their symptoms as non-cardiac in origin; (2) emergency medical services are infrequently used; (3) insufficient pre-hospital healthcare infrastructure contributes to pre-hospital delay; (4) multiple stops are made before arriving at a facility that can provide definitive diagnosis and treatment; (5) relatively high costs of treatment and lack of widespread health insurance coverage limits care delivery; and (6) novel mobile technologies may allow for faster diagnosis and initiation of treatment in the pre-hospital setting.

Conclusions: Individualized patient-based factors (general knowledge of ACS symptoms, socioeconomic position) and broader systems-based factors (ambulance networks, coordination of transport) affect pre-hospital ACS care in Kerala. Improving public awareness of ACS symptoms, increasing appropriate use of emergency medical services, and building a infrastructure for rapid and coordinated transport may improve pre-hospital ACS care.

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1. Introduction

1.1. Background

Ischemic heart disease is the leading cause of death in India.¹ Deaths due to ischemic heart disease are frequently caused by acute coronary syndromes (ACS), which occur suddenly and outside of the hospital setting. In high-income countries, short-term case fatality rates for ACS, including acute myocardial infarction, have fallen dramatically from approximately 25% in the early 1980s to as low as 4% in the current era, due at least in part to a combination of medical

therapy, reperfusion, and better overall intensive care, including availability of defibrillation.^{2–5} More recent initiatives like the American Heart Association's *Mission: Lifeline* have sought to reduce morbidity and mortality from ACS in the United States by targeting the pre-hospital delivery of ACS care and improving healthcare system readiness and response to acute myocardial infarction.⁶ In India, despite the magnitude and well-recognized need for emergency medical care for patients with ACS, few data are available on the pre-hospital structure and delivery of ACS care.

1.2. Importance

The World Health Organization describes health systems in a framework that includes six “building blocks”: service delivery, health workforce, information, medicines, financing, and governance.⁷ For the optimal delivery of pre-hospital ACS care in India,

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each “block” in this model may be considered as a target for development. Inaccessibility to medical evaluation, insufficient numbers of trained pre-hospital ACS providers, lack of public knowledge of ACS symptoms, and relatively high costs of procedures for ACS treatment may contribute to suboptimal pre-hospital care in this population. In fact, limited pre-hospital data from a 2008 Indian ACS registry has shown that Indian patients with ACS delay an average of six hours from symptom onset to medical presentation and rarely use emergency medical transport services.⁸ Describing the pre-hospital experience of an ACS patient from a healthcare provider’s perspective, particularly addressing the facilitators, barriers, and context of optimal pre-hospital care, may provide valuable insights into factors that contribute to excessive delay and targets for intervention. Furthermore, understanding ACS providers’ interactions with the healthcare system may provide opportunities to improve early detection and treatment in the critical pre-hospital time period.

1.3. Goals

To address these gaps in knowledge, we interviewed a variety of ACS providers and asked them to describe their experiences in caring for ACS patients. We sought to identify facilitators and barriers to the delivery of optimal pre-hospital care and engaging the healthcare system.

2. Methods

2.1. Study design and sample

We conducted a qualitative study of pre-hospital ACS providers and administrators (cardiologists, emergency room physicians, emergency room nurses, coronary care unit nurses, cardiac catheterization laboratory technicians, ambulance paramedics, a hospital administrator, and a state government health policy official) who were associated with the Acute Coronary Syndromes: Quality Improvement in Kerala (ACS QUIK) study, a cluster-randomized, stepped-wedge clinical trial investigating the implementation of a quality improvement toolkit on major adverse cardiovascular events in 63 hospitals throughout the South-Indian state of Kerala (ClinicalTrials.gov Identifier: NCT02256657). We chose a qualitative approach because we were interested in capturing critical aspects of a complicated process that is difficult to measure quantitatively and where little is known in the Indian context: namely, the individualized regional systems of the delivery of pre-hospital ACS care. Such methods are increasingly recognized as providing unique and valuable contributions to cardiovascular disease outcomes and health services research.^{9,10} We used a grounded theory approach to guide our study, deriving explanations or theories inductively from the data we acquired.¹¹

We selected an initial sample of participants who were uniquely able to provide insights of central importance to the study’s purpose (purposive sampling frame) and who varied widely in the scope of their interactions with patients (maximum variability sampling). We then used a snowballing sampling technique¹² based on these initial interviews and focus group discussions (FGDs). We contacted eligible participants either by a phone call or by an introductory letter sent via email explaining the purpose of the study and inviting their participation. We conducted in-depth interviews and FGDs in-person from October 2014 to March 2015. The final sample size was determined by the criterion of theoretical saturation, or the point at which no novel concepts emerged from successive interviews.¹³ Collective saturation was achieved on completion of 20 interviews and FGDs.

2.2. Data collection and measures

In-depth interviews and FGDs elicited individual provider perceptions and experiences through open, nondirective questions in a semi-structured format. The interviews began with a broad grand tour question¹⁴: “Tell me about your typical experience or interaction with an acute coronary syndrome patient prior to hospitalization.” We used standard, open-ended probes to encourage providers to increase the breadth or depth of responses and clarify their statements. Consistent with the grounded theory approach, data collection and analysis were iterative in nature, and our interview guide evolved as more interviews were conducted and analysis was done to ensure that emerging themes were explored in subsequent interviews.^{11,15}

Two members of the research team conducted all the interviews and FGDs in-person, except one interview, which was conducted via telephone. Interviews and FGDs ranged from nine minutes to one hour and six minutes in length, with a median length of 24 min (IQR: 24–30 min). All interviews and FGDs were conducted in English, audiotaped on two separate devices, and transcribed by one author (AP). To further describe the sample, we collected demographic data on each participant and the hospital where they worked. The study was approved by the Institutional Review Board at Northwestern University in Chicago, USA and the Ethics Committee of the Centre for Chronic Disease Control in Gurgaon, India, which is the national coordinating center of the ACS QUIK study. Interviewees and discussants provided written or verbal informed consent for their participation in the study.

2.3. Data analysis

We analyzed data from the transcribed interviews by classifying quotes from participants with specific codes (labels assigning meaning to excerpted segments of text) developed iteratively. We created an initial code structure after the first several transcripts were reviewed, and as additional transcripts were added, we compared excerpts from new transcripts with previously coded sections to ensure consistent assignment of codes to similar data. We defined the properties and dimensions of each code as the code was created. We continued the process by refining and grouping codes into subcategories based on similarities with other codes, until no new concepts emerged in subsequent transcripts. One author (AP) coded all 19 transcripts independently, and individual codes were discussed among members of the research team. The process generated a set of 15 codes with 58 sub-codes that captured major concepts in the acquired data. Using the coded data, two authors developed the initial theoretical framework, which was updated with input from the study team to describe the key themes related to pre-hospital ACS care in Kerala as well as facilitators, barriers, and context for optimal pre-hospital ACS care. We used Dedoose v5.3.12 software (Manhattan Beach, USA) for data organization, analysis, and retrieval.

3. Results

3.1. Participant characteristics

Our sample included 27 pre-hospital ACS providers (Table 1). The majority of the providers were male (59%) and worked for a private hospital (70%). Six themes, derived from our theoretical framework (Fig. 1), characterized the experiences and insights of these providers related to pre-hospital ACS care (Fig. 2).

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