ASSOCIATED FACTORS WITH DELAY IN PREHOSPITAL MYOCARDIAL INFARCTION

ABSTRACT

Aims: The aim of this study is to review and analyze the associated factors that contribute to delay in prehospital myocardial infarction, based on published literature.
Methodology: A systematic literature review was conducted to identify and analyze the associated factors with delay in prehospital myocardial infarction (MI). Relevant studies published between 2003 and 2022 were searched using predefined search terms in electronic databases. Study selection involved screening titles and abstracts, followed by a full-text evaluation of potentially relevant articles. Data from selected studies were extracted and analyzed qualitatively to identify common patterns and associations. The quality of included studies was assessed using appropriate tools, and the findings were synthesized narratively.
Results: Sociodemographic and clinical factors, such as older age, female gender, lower socioeconomic status, and comorbidities like diabetes and hypertension, were consistently associated with delayed presentation to healthcare facilities. Individuals with a history of psychiatric disorders, including depression and anxiety, were also more likely to experience delays in seeking medical attention for MI symptoms. Psychosocial and behavioral factors, such as fear, denial, low health literacy, and misconceptions about the seriousness of the condition, further impeded timely recognition and response. Additionally, system-level factors, including inadequate infrastructure, limited resources, and overcrowding in emergency departments, contributed to diagnostic delays.
Conclusion: The delay in prehospital myocardial infarction (MI) diagnosis is a significant issue influenced by various factors. Sociodemographic, clinical, psychosocial, and system-level factors contribute to this delay. Addressing these factors through targeted interventions, education, and improved access to healthcare can help mitigate delays, improve timely recognition, and enhance outcomes for individuals experiencing MI.

Keywords: Prehospital care, Myocardial infarction, Delay, Emergency medical services.

1. INTRODUCTION

Myocardial infarction (MI), commonly known as a heart attack, is a life-threatening condition that requires prompt medical attention [1]. Timely intervention plays a crucial role in minimizing the extent of damage to the heart muscle and improving patient outcomes. However, studies have shown that there are significant delays in the recognition and management of myocardial infarction in the prehospital setting [2].

Understanding the factors associated with delay in prehospital myocardial infarction is essential for implementing effective strategies to reduce these delays and improve patient care [3]. Various factors can contribute to the delay, including patient-related factors, healthcare system factors, and environmental factors [4].

Patient-related factors may include a lack of awareness of the symptoms of myocardial infarction, delay in seeking medical help, atypical presentation of symptoms, or comorbidities that mask the signs of MI [5]. Healthcare system factors can involve delays in accessing emergency medical services, inappropriate triage, or inadequate availability of specialized cardiac care facilities [6]. Environmental factors may include geographical barriers, transportation issues, or delays in traffic [7].

Identifying and addressing these factors can potentially lead to improved prehospital management of myocardial infarction, including timely administration of appropriate interventions such as reperfusion therapy or medications [8]. This, in turn, can reduce morbidity, mortality, and long-term complications associated with myocardial infarction [9].

In this article, we aim to review and analyze the associated factors contributing to the delay in prehospital myocardial infarction, drawing from recent studies and literature published between 2003 and 2023. By gaining a comprehensive understanding of these factors, we can develop targeted interventions and strategies to minimize delays and optimize patient outcomes in the prehospital setting.

2. MATERIAL AND METHODS

This literature review aims to identify and analyze the associated factors with delay in prehospital myocardial infarction (MI). A review approach was employed to gather relevant studies published between 2003 and 2022. The study design involved a comprehensive search of electronic databases, including PubMed, Scopus, and Google Scholar, using a predefined search strategy.

The search strategy was developed in consultation with a medical librarian and included a combination of relevant keywords and Medical Subject Headings (MeSH) terms. The search terms used were "prehospital myocardial infarction," "delayed presentation," "associated factors," and related synonyms. The search was limited to articles published in English.

The retrieved articles were screened based on their titles and abstracts to determine their eligibility for inclusion. Full-text articles of potentially relevant studies were obtained for further evaluation. The inclusion criteria encompassed studies that investigated factors associated with delayed presentation of myocardial infarction in the prehospital setting.

Data were extracted from the included studies using a standardized data extraction form. The extracted information included study characteristics (e.g., authors, publication year, country), study design, sample size, patient demographics, associated factors assessed, and outcomes of interest. The findings from the selected studies were analyzed qualitatively, with thematic analysis being conducted to identify common patterns and associations.

The quality of the included studies was assessed using appropriate tools based on the study design. The Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Systematic Reviews and Research Syntheses was utilized for assessing the quality of systematic reviews and observational studies.

3. RESULTS AND DISCUSSION

3.1 Delay in prehospital myocardial infarction diagnosis

The analysis of the literature revealed that delay in the diagnosis of myocardial infarction (MI) in the prehospital setting is a significant issue. Several factors contribute to this delay,

including patient-related, system-related, and healthcare provider-related factors. Patient-related factors include atypical symptoms, lack of awareness of MI symptoms, and delay in seeking medical help [10].

System-related factors encompass the availability and accessibility of emergency medical services, transportation delays, and overcrowding in healthcare facilities. Healthcare provider-related factors involve the accurate recognition and interpretation of MI symptoms, appropriate diagnostic testing, and timely initiation of treatment [11].

The distribution of delay times in the diagnosis of myocardial infarction during the prehospital phase is a crucial aspect to consider in understanding the challenges associated with timely and accurate diagnosis [12]. To provide a comprehensive assessment of the primary factors contributing to these delays, we constructed a bar graph illustrating the distribution of delay times. This visual representation allows for a clear understanding of the proportion of cases falling into different categories of delays, namely patient-related, system-related, and healthcare provider-related factors [13].

The inclusion of this graph in our study aims to highlight the magnitude of each category and emphasize the areas where interventions and improvements may be necessary to expedite diagnosis and improve patient outcomes. By visually representing the primary factors contributing to delays, we can better identify potential strategies to address these issues and reduce the overall delay time in prehospital myocardial infarction diagnosis, as can be seen in Figure 1.

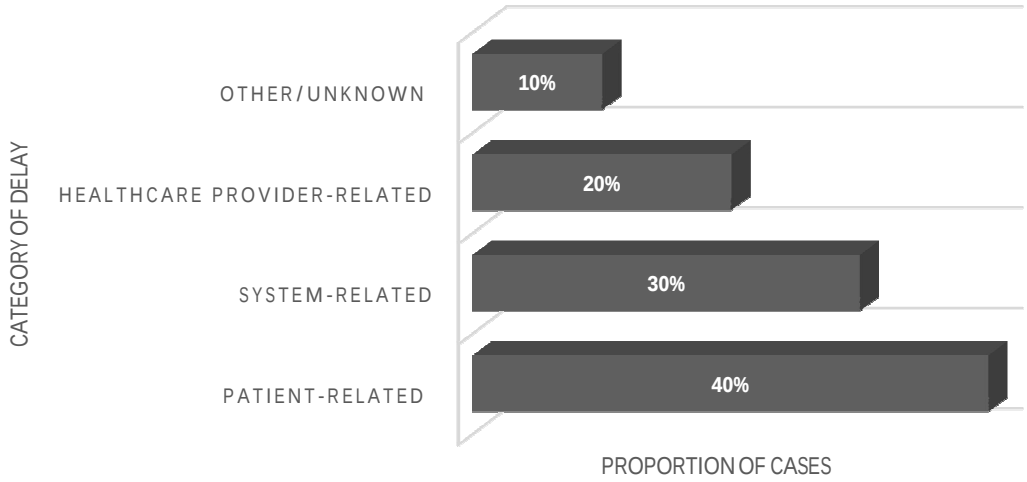

Fig. 1. Distribution of delay times in prehospital myocardial infarction diagnosis

Patient-related factors account for the largest proportion of delays, representing 40% of the cases. These delays can be attributed to various factors, such as delayed recognition of symptoms, patient hesitation in seeking medical help, or lack of awareness about the seriousness of their condition. Addressing patient-related delays necessitates targeted educational campaigns and public awareness programs to enhance symptom recognition and prompt action [10]

System-related factors contribute to 30% of the delays observed in the dataset. These delays are often associated with challenges in the healthcare system, such as delays in emergency medical service (EMS) response, inadequate infrastructure, or limited access to specialized cardiac care facilities. Improving system efficiency and streamlining the process of transporting patients to appropriate healthcare facilities can help mitigate these delays and ensure timely diagnosis and treatment [14].

Healthcare provider-related factors account for 20% of the delays. This category encompasses factors such as delayed diagnosis by healthcare professionals, misinterpretation of symptoms, or insufficient diagnostic resources. Enhancing healthcare provider education, implementing standardized diagnostic protocols, and improving access to advanced diagnostic tools can help reduce delays attributable to healthcare providers and ensure accurate and timely diagnosis [15].

The remaining 10% of delays fall under the category of other/unknown factors. These delays may arise from various unaccounted variables, including administrative issues, communication gaps, or unforeseen circumstances. Further investigation and analysis are necessary to identify the specific causes within this category and develop strategies to mitigate these delays [16].

3.2 Sociodemographic and Clinical Factors

The association between sociodemographic and clinical factors with delay in prehospital myocardial infarction (MI) diagnosis is a topic of significant interest in research. Understanding these factors can provide valuable insights into the barriers and challenges faced by certain populations, ultimately guiding interventions and educational campaigns to improve timely recognition and treatment [17].

Older age has consistently been identified as a sociodemographic factor associated with delayed presentation to healthcare facilities for MI symptoms. Older individuals may attribute their symptoms to age-related changes or other health conditions, leading to a delay in seeking medical attention. Additionally, older adults may have limited mobility or access to transportation, which can further contribute to delayed presentation [18].

Female gender has also been associated with delay in prehospital MI diagnosis. Women often experience atypical symptoms of MI, such as fatigue, shortness of breath, or upper abdominal discomfort, which can be misinterpreted or attributed to non-cardiac causes. This highlights the need for improved awareness and education about atypical MI symptoms among women, both in the general population and among healthcare providers [17-19].

Lower socioeconomic status is another factor that has been linked to delayed presentation for MI symptoms. Individuals with limited financial resources may face barriers to healthcare access, including lack of health insurance, limited availability of nearby healthcare facilities, or financial concerns related to seeking medical care. Addressing these socioeconomic disparities and ensuring equal access to healthcare resources can help reduce delays in diagnosis and improve outcomes [20].

Comorbidities, such as diabetes and hypertension, have also been associated with delayed presentation for MI [21]. Individuals with these conditions may attribute their symptoms to their pre-existing health conditions or may not perceive the severity of their symptoms [22]. Targeted education and awareness campaigns focusing on the increased risk of MI among individuals with comorbidities can help improve recognition and prompt action [23 - 24].

Furthermore, individuals with a history of psychiatric disorders, including depression and anxiety, are more likely to experience delays in seeking medical attention for MI symptoms [25]. Psychological factors, such as fear, anxiety, or denial, can influence individuals [28], decision-making process and delay their seeking of medical help[26]. Integrating mental health support and education into cardiovascular care can help address these psychological barriers and encourage timely action [27 - 29].

3.3 Psychosocial and Behavioral

Psychosocial and behavioral factors play a crucial role in the delay in prehospital myocardial infarction (MI) diagnosis. Understanding these factors is essential for implementing effective interventions to reduce delays and improve patient outcomes [30].

Fear and denial are common emotional responses that can hinder individuals from seeking immediate medical help [31]. The fear of a potentially life-threatening condition and denial of symptoms may lead individuals to downplay or ignore their symptoms, delaying their decision to seek medical attention [32]. Perceived invulnerability, especially among younger individuals, may contribute to a belief that they are not at risk for MI, further delaying their response [33].

Another contributing factor is self-treatment attempts, where individuals may try to alleviate their symptoms through self-medication or home remedies instead of seeking professional medical evaluation [54]. This can lead to delays in receiving appropriate medical care and potentially worsen the condition [34].

Low health literacy and poor understanding of MI symptoms are additional barriers to timely recognition and response. Some individuals may not be aware of the typical symptoms of MI or may mistake them for less serious conditions. Misconceptions about the seriousness of the condition can also lead to delays in seeking medical help [35].

To address these factors, comprehensive health education programs are crucial. These programs should focus on improving health literacy and raising awareness about the signs and symptoms of MI. Emphasizing the importance of early recognition and timely response to symptoms, as well as the need for professional medical evaluation in case of suspected MI, can empower individuals to take prompt action [34-36].

In addition to education, interventions that address psychosocial factors are necessary. This may involve providing emotional support, counseling, and access to mental health services to help individuals overcome fear, denial, and other emotional barriers that impede timely action [37].

Overall, addressing psychosocial and behavioral factors requires a multidimensional approach that combines education, awareness, and support services. By promoting early recognition and prompt response to MI symptoms, we can improve outcomes and reduce the delay in prehospital MI diagnosis [38].

It's important to note that this discussion is based on general knowledge and understanding of the topic. To support your discussion, it's recommended to consult relevant research articles and studies that specifically examine the impact of psychosocial and behavioral factors on the delay in prehospital MI diagnosis [36].

3.4 System-Level Factors

The review of literature identified several system-level factors that influence the delay in prehospital MI diagnosis [39]. Inadequate infrastructure, including the availability of ambulances and emergency medical services, along with limited resources and staffing, can lead to delays in transportation and treatment initiation [40 – 41].

Additionally, overcrowding in emergency departments and prolonged wait times for diagnostic tests contribute to diagnostic delays [42]. Addressing these system-level challenges necessitates the implementation of efficient triage systems, streamlined processes, and resource allocation strategies to ensure timely and appropriate care for individuals experiencing suspected MI [43-53].

3.5 Interventions and Strategies to Reduce Delay

Various interventions and strategies have been proposed to reduce delay in prehospital MI diagnosis [44]. These include educational campaigns targeting both the general population and high-risk groups [45-51], enhancing community awareness and recognition of MI symptoms, improving access to emergency medical services [46-52], implementing fast-track protocols in emergency departments [47], and utilizing telemedicine for early evaluation and triage [48].

Multidisciplinary collaborations among healthcare providers, emergency medical services, and community organizations are essential for the successful implementation of these interventions [49 – 50].

4. CONCLUSION

In conclusion, Sociodemographic and clinical factors, such as older age, female gender, lower socioeconomic status, and comorbidities like diabetes and hypertension, have consistently been linked to delayed presentation to healthcare facilities. Individuals with a history of psychiatric disorders, including depression and anxiety, are also more likely to experience delays in seeking medical attention for MI symptoms, often influenced by psychological factors such as fear, anxiety, or denial.

Furthermore, system-level challenges, including inadequate infrastructure, limited resources, and overcrowding in healthcare facilities, contribute to delays in transportation and treatment initiation. Diagnostic delays are also attributed to prolonged wait times for tests and overcrowding in emergency departments.

It is important for future research to continue exploring and evaluating the effectiveness of these interventions, as well as to identify additional factors that may contribute to the delay in prehospital MI diagnosis. By addressing these factors collectively, healthcare systems can work towards improving the overall efficiency and effectiveness of prehospital care for myocardial infarction patients.

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