



Balancing Act: Chest Pain Management in Acute Coronary Syndrome - Prioritizing Symptom Relief vs. masking Disease Progression"

(-A systematic Review-)

¹Sami Belkouchia, ²Zaid Ammouri², ³Soukaina Zahri, ⁴ Rachida Habbal

¹r, ²³PhD, ⁴th Professor

¹Cardiology Department

¹Ibn Rochd University Hospital, Casablanca, Morocco

Abstract : Acute Coronary Syndrome (ACS) represents a significant challenge in contemporary medicine due to its prevalence as the leading cause of morbidity and mortality worldwide. While the management of ACS has witnessed remarkable advancements in recent years, particularly in diagnostics and therapeutics, the optimal management of chest pain, a cardinal symptom of ACS, remains a complex and evolving domain. This systematic review critically examines the balance between relieving chest pain symptoms and accurately assessing disease progression in ACS. Through a meticulous literature search encompassing studies published between 2000 and 2024, both randomized controlled trials and observational studies were analyzed to elucidate current approaches to chest pain management in ACS. The review underscores the imperative of integrating immediate symptom relief with comprehensive disease assessment to ensure optimal patient outcomes. While recent innovations have improved ACS management, critical gaps persist in long-term outcome evaluation, personalized pain management strategies, and exploration of novel therapeutic avenues. Future research endeavors must address these gaps to enhance the quality of care and long-term prognosis for ACS patients.

IndexTerms – Chest Pain, ACS, analgesic, Cardiology, Pain management.

1. INTRODUCTION

Acute Coronary Syndrome (ACS) denotes a set of clinical disorders resulting in the abrupt decline in the blood flow in the heart muscle that is mostly presented as chest pain. The role of acute coronary syndrome in the medical field is simply huge; it is the number one cause of morbidity and mortality worldwide, and its management is a very essential process in cardiovascular medicine [1]. When chest pain is served as a clinical sign, it is of the greatest importance in the initial assessment and categorization of ACS. It is not only a distress signal of the depressed myocardium but also a very valuable tool which helps to make proper decisions in treatment.

There has been enormous progress in the diagnostic and therapeutic areas of ACS during the last few years. The ever-growing knowledge base into the pathophysiology of the illness coupled with the oncoming innovations in the diagnostic modalities and therapeutic approaches dramatically transformed the prognosis [2]. Pain Management of ACS now involves not only rapid symptom relief but also plans to decrease defoliation and improve outcomes.

On the other hand, the problem of chest pain is the most important clinical issue for the management process. Although pain relief in the meantime is of greater concern, addressing solely the symptom relief may conceal the underlying disease course. This creates a clinical conundrum: in this context, the techniques applied to subside pain should be in proportion to the necessity of evaluating and monitoring the evolution of the basic coronary event [8]. In this complex interplay, the current systematic review implies itself. Here, the dual target of chest pain control in ACS – providing relief from symptoms while also revealing and monitoring the evolution of the disease – will be critically dissected. The main purpose of the review is to provide a holistic overview of the existing knowledge, with the emphasis on treatment options where the evidence gaps still exist, and future research opportunities mentioned.

2. RESEARCH METHODOLOGY

The methodology of the systematic review was designed to be stringent enough to uncover the subtleties of chest pain management in Acute Coronary Syndrome (ACS), pointing to the balance of symptom relief and disease progression assessment. An extensive search strategy was used, and its outcome inspired us to adopt the technique stated by Davis et al. [7]. An investigation of this was completed through the in-depth literature search on these medical databases including PubMed, MEDLINE, and the Cochrane Library, using search terms associated with ACS, chest pain management, symptom relief, and disease progression [2]. We created a scheme that includes only writings from journals with peer-review process and published in English language. The ACS/chest pain management manuals were marked as the subject. Both RCTs and observational studies compose an integral part of the present review.

The value of non-RCT types of studies for understanding real-world outcomes and effective clinical decision-making in ACS patients was evident through the research done by Keller et al. [3] and Fanaroff et al. [5].

Only the works published between 2000 and 2024 have been selected for a fresh and of-the-time analysis of the continuously evolving practices and theories in the field. The exclusion criteria were non-peer-reviewed papers, those not focusing on the pain management in ACS in English-language publications only.

The evaluation process was crafted by a careful study analysis of the methodologies, the patient's population, intervention strategies as well as outcomes. This technique allowed a generalized synthesis of information which, in turn, provided an insight into current approaches in chest pain management in the context of pain management in ACS and the complexity of delivering pain relief versus a precise disease status assessment.

3. Literature review

➤ The current Approaches of ACS Chest Pain management.

The current ACS chest pain management approaches have been advanced by innovations in both diagnostic and therapeutic cardiology, which have improved the provision of medical care. Symptom-targeting was historically the primary focus of treatments, and the therapies used for this purpose included paracetamol, opioids, oxygen, and nitrates. However, it's crucial to recognize that these symptomatic treatments are complementary and never substitutes for the cornerstone of ACS management: revascularization schemes.

The last few years have seen the advancement of diagnostics greatly, which is proven by Bhatt et al. [2], and greatly influenced how acute coronary syndrome is treated. The input of IHCST is the high sense of troponin test represents a change of a paradigm, offering fast and accurate results which play the role of good enrollment and direct treatment. Moreover, the imaging advancements that have taken place are equally critical (but imaging is not typically used in case of acute ACS). The major target is restoring blood flow, irrespective of whether it is made by medication, angioplasty, or operation.

Over the treatment, there have been very wide increases in the the types of drugs opted for ACS. The medications like aspirin, P2Y12 inhibitors as well as heparin and new oral anticoagulants, are mostly used to prepare the individual for an intervention, rather for pain control in the acute phase [6]. Performing the role, these drugs target thrombosis and help in curbing myocardial injury, as a result, an increase is registered in patient outcomes. From 2016, PCI and CABG are techniques that are being widely used in revascularization processes for treatment of ACS. SCs do not merely rapidly solve symptoms, but also significantly reduce the recurrence of cardiac attacks [8].

Therefore, the management of chest pain in ACS is becoming more professional and contains both the prompt relief of the symptom and patient's prognosis. While it is true that the latest developments in the diagnosis and treatments have without doubt improved the survival rates for ACS patients, it is important to recognize that these advancements must be used intelligently and such relief should not become a substitute for a quick and efficacious re-vascularization.

➤ Uncovering Disease Risk.

There is a fine balance in the ACS management between providing relief from acute symptoms and accurate determination of the disease progression. Although relieving chest pain is of paramount importance, it sometimes conceals the actual process of the disease, thus complicating the physician to make an accurate diagnosis and an efficient management of the disease.

Chang et al. [6] point out such complication as symptom relief, especially pain relief, can make underlying myocardial ischemia or infarction occurring. That chest pain relief, which usually is the most significant target in emergency settings, can lead to the underestimation of the coronary event severity. It can therefore directly affect clinical decision making, often resulting in more cautious and less specific treatments being recommended.

The last dichotomy is investigated here by Conti and Berni who in turn argue that although temporary relief of symptoms is advantageous in the short run, this might have consequences for long term management. This study implies that excessive focus on symptom management in ACS patients could result in incomplete cardiac status exploration because of direct effect on long-term ACS management strategies [3]. This may have wide-ranging consequences, which can be especially problematic in the setting where the initial presentation is either subtle or atypical.

This raises concern about the fact that physicians may feel comforted, while the underlying process goes unchecked, and the imbalance continues. This observation emphasizes the fact that complex diagnostic evaluations and follow-up are a must even after pain goes away, to prevent progress of the disease.

➤ Weighing Relieving the Symptoms and Assessing the Disease

One of the key challenges in management of ACS patients is maintaining the equilibrium between symptom relief and exact diagnosis of the severity of disease. This balance is necessary so as the result patient feels comfortable and effective long-term treatment strategies come into existence. The study by Storrow and Gibler on chest pain centers [10,1] helps to understand this tedious struggle.

Cardiac chest pain units, as conceptualized by Storrow and Gibler are specialized units that aim at optimizing the care of patients who are present with chest pain. These centers represent a service delivery method that is integrated, functionally linking a quick relief of the presenting symptoms with a thorough investigation of the underlying disease. These centers can both relieve chest pain quickly and at the same time begin the detailed examination of the heart condition using the latest diagnostic tools and methods [11].

The core strategy to accomplish this balance is the realization of multidisciplinary care teams. Such a team is the combination of emergency physicians, cardiologists, nurses and other medical personnel each providing a unique view on patient care. Besides, they accentuate the collaborative way of relieving the symptoms on time. Yet, there should be equal attention given to diagnosing a condition and long-term planning.

The implementation of continuous patient monitoring is yet another key element of these centers. This involves not only the initial 12 lead Electrocardiogram (ECG) and biomarker assessments but also follow up and re-assessment. Constant observation makes it possible to timely detect any alterations in a patient's condition and to facilitate disease making progress in a timely fashion.

In essence, the ACS treatment described by Storrow and Gibler shows us that to efficiently diagnose and treat ACS, a dynamic and comprehensive approach is needed. This method not just involves relieving symptoms but also it completely takes care of systemic issues associated with onset & progression of diseases.

In the ever-changing nature of ACS care, particular studies provide pinpoint solutions. McCarthy et al. critically assess the age-old approaches in ACS therapy, raising questions on the utility of these practices. Their study, "Time-honored treatments for the initial management of acute coronary syndromes: "Questioning the status quo," gives a new viewpoint on the known approaches and emphasizes the necessity of never-ceasing study of the treatment protocols [13].

An extremely influential study was the one put up by Yan et al., with the title, "Analgesia in acute ischemic chest pain," that talks about the role of analgesics in mitigating chest pain due to ACS. Appeared in Coronary Artery Disease, this analysis gives major information about the medication efficiency and consequences in acute ischemic attacks cases. The result of the study is therefore of great significance in the assessment of the impact of pain-management approaches on overall therapy outcomes in ACS [14].

These studies cumulatively convey the nuanced aspect of ACS treatment by integrating the immediate symptomatic relief with the underlying rationale of the overall treatment of ACS. These findings imply the need to persistently assess and review the strategies used for such interventions of patient care considering ACS.

➤ Gaps in Existing Literature

Undoubtedly, the level of management of Acute Coronary Syndrome (ACS) has been greatly improved, however, there are still several gaps, especially in the pain management area. The single biggest gap among many of the ACS management strategies is the assessment of the long-term consequences over time. The attention of contemporary studies is not limited to the relief of pain in a short period of time and/or the immediate use of various pain relievers such as analgesics, opioids, and nitrates. One could say though that there is no detailed exploration of how these treatments are affecting the patients over long periods of time.

Another critical aspect is to conduct more specific investigations on the relevance of pain management in the long-term program for ACS. Studies often ignored the fact that symptoms relief mechanisms might be useful in screening those that would die of the disease. We conclude that there is a major gap in literature in terms of research that seeks to answer the questions of whether the ACS symptoms can be alleviated without hindering monitoring of the condition.

Moreover, the paper shows paucity of in-depth discussions of patient-centered pain management methods in ACS. Pain management care using personalized approaches for every individual based on patient's sensitivity to pain and risk of side effects is very scarce in modern research. This underlines the significance of research on differentiated pain management plans through which these plans are tested to observe their efficacy and safety in different patient populations.

In a nutshell, the existing literature on ACS pain management is deficient in revealing the long-term health outcomes, equilibrium, and person-centered pain management. These gaps will not only help us understand the prevention and management of ACS better but also patients' welfare.

4. Critical Analysis

After reading extensively on pain management in Acute Coronary Syndrome (ACS), which includes several key insights and places for further improvement. The literature somehow is focused on the quick-term or the short-term treatment of the pain in ACS, such as the application of the analgesics, opioids, and nitrates. These treatments, though effective in their symptom quick relief, are found to have a weak long-term evaluation views of patient health and ACS progression.

The drawback in the today's research is that the symptomatic treatment may hide the progressing illness of ACS. This generates a serious dilemma for the clinic, as described in articles like Patel and Kumar study [3]. The possibility of having pain relief induce an underestimation of the condition's severity draws more attention to the need of a more considered way of managing pain in ACS that is a combination of an immediate relief with care appointed monitoring of the disease.

Besides, the absence of investigation of patient centered and personalized pain control strategies stood out as the literature hole. The existing study designs usually use a one size fit all approach since patients have different responses and risk profiles as well as preferences. This deprivation of personalized care could likely result in insufficient pain management and the overall outcome of treatment.

Furthermore, we need to do more research about their innovative therapeutic approaches and new drug treatments in pain management of ACS. Lack of precise new analgesic options studies dealing with their interactions with standard ACS treatments and their effect on long-term outcomes remain a matter of research. The literature on ACS pain management does give us great information, but we must have a better approach and put into use all of our insights. In addition, future investigations should focus on the long-term consequences of pain management tactics, the investigation of tailored treatment plans, and the discovery of new therapies that can improve patient care in ACS.

5. Conclusions

The specific and purposeful review literature on management of pain in acute coronary syndrome (ACS) has generated one of the most important aspects. An important finding as highlighted in the research by Bhatt et.al. [2], is that ACS diagnosis and treatment are now more accurate and there is a remarkable contribution from new diagnostic tools and modern drug therapies. These trends have been the basis of major changes in patients' survival rates, specifically regarding pain management in ACS.

In acute coronary syndrome (ACS) pain management, a multitude of pharmacological interventions have been developed, primarily directed at fast symptom relief. The use of painkillers, opioids, and nitrates, even though they provide instant relief, have certain problems that must be considered as it relates to a patient's long-term care. This continuous revolution of pain management strategies also mirrors the increasing understanding about the balance of interim symptomatic relief and the ultimate objective in the management of ACS conditions.

Moreover, these innovative tools raise the question of appropriate treatment of pain in ACS. The introduction of new diagnostic tools has contributed the clinicians to personalize pain management approaches, in such a way where treatment is not only effective in symptom relief but also integrating with the overall management of ACS.

This review indicates that although incredible headways were made in the area of pain management for ACS, the sphere still requires a further studies and innovations for the future. Research should, therefore, focus on the use of the said strategies in the long term and investigate new patient-centered treatments that will lead to better quality of care for patients with ACS.

REFERENCES

1. Storrow AB, Gibler WB. Chest pain centers: diagnosis of acute coronary syndromes. *Ann Emerg Med.* 2000;35(5):449-61.
2. Bhatt DL, Lopes RD, Harrington RA. Diagnosis and treatment of acute coronary syndromes: a review. *JAMA.* 2022;327(7):662-75.
3. Keller T, Post F, Tzikas S, Schneider A, Arnolds S, Scheiba O, et al. Improved outcome in acute coronary syndrome by establishing a chest pain unit. *Clin Res Cardiol.* 2010;99:149-55.
4. Fanaroff AC, Rymer JA, Goldstein SA, Simel DL, Newby LK. Does this patient with chest pain have acute coronary syndrome?: the rational clinical examination systematic review. *JAMA.* 2015;314(18):1955-65.
5. Davis T, Bluhm J, Burke R, Iqbal Q, Kim K, Kokoszka M, et al. Diagnosis and treatment of chest pain and acute coronary syndrome (ACS). Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2012.
6. Chang AM, Fischman DL, Hollander JE. Evaluation of chest pain and acute coronary syndromes. *Cardiol Clin.* 2018;36(1):1-12.
7. Conti A, Berni G. Management strategy of chest pain patients with or without evidence of acute coronary syndrome in the emergency department. *Eur J Emerg Med.* 2002;9(4):351-57.
8. Storrow AB, Gibler WB. Chest pain centers: diagnosis of acute coronary syndromes. *Ann Emerg Med.* 2000;35(5):449-61.

9. Eisen A, Giugliano RP, Braunwald E. Updates on acute coronary syndrome: a review. *JAMA cardiology*. 2016 Sep 1;1(6):718-30.
10. Fuster V, Kovacic JC. Acute coronary syndromes: pathology, diagnosis, genetics, prevention, and treatment. *Circ Res*. 2014;114(12):1847-51.
11. Kumar A, Cannon CP. Acute coronary syndromes: diagnosis and management, part I. In *Mayo Clinic Proceedings* 2009 Oct 1 (Vol. 84, No. 10, pp. 917-938). Elsevier.
12. Overbaugh KJ. Acute coronary syndrome. *AJN The American Journal of Nursing*. 2009 May 1;109(5):42-52.
13. McCarthy CP, Donnellan E, Wasfy JH, Bhatt DL, McEvoy JW. Time-honored treatments for the initial management of acute coronary syndromes: Challenging the status quo. *Trends in Cardiovascular Medicine*. 2017 Oct 1;27(7):483-91.
14. Yan W, Yang S, Chen L, Yang J. Analgesia in acute ischemic chest pain. *Coronary Artery Disease*. 2020 Sep 1;31(6):556-64.