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ORIGINAL ARTICLE

Determine the Vital Sign Observations that can Detect Signs of Cardiopulmonary Arrest in Patients Receiving Internal Medicine Care

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ABSTRACT

Background: In certain hospitals, the Medical Emergency Team (MET) has undergone development to provide prompt and efficient treatment, effectively preventing cardiac arrests. Our objective was to assess the efficiency of observational practices in identifying anomalies in vital signs before cardiac arrest and to evaluate the requirement for implementing a MET system in hospitals across Punjab.

Methods: We conducted a comprehensive review of patient charts from four hospitals, specifically focusing on individuals who experienced cardiac arrest over a span of 12 months. We meticulously documented and analyzed the vital signs, symptoms, and interventions that occurred within the 12 hours leading up to the cardiac arrest, comparing them against the trigger criteria established by the Medical Emergency Team (MET).

Results: Throughout the designated study period, a total of 130 patients experienced cardiac arrest while in hospitals, with 68 cases (52%) occurring on the wards. Among these patients, 34 individuals (41%) displayed abnormal vital signs that met the criteria established by the Medical Emergency Team (MET). These abnormalities were documented, on average, 3.7 hours prior to the cardiac arrest event. Notably, during this timeframe, 14 patients did not receive any form of intervention, such as supplemental oxygen or medication. Among the remaining patients, nine received intervention within 2 hours, while nine others received intervention after more than 1 hour. It is important to mention that none of the patients responded to the initial intervention. However, only one patient required subsequent re-interventions.

Practical Implication: It is essential for healthcare providers in this field to be knowledgeable, skilled, and prepared to respond promptly and effectively to cardiopulmonary arrest emergencies. By staying updated on the latest guidelines and practicing interdisciplinary collaboration, healthcare teams can strive towards optimizing outcomes and ensuring the safety of their patients.

Conclusion: There is a prevalent occurrence of notable physiological decline in the hours leading up to cardiac arrests within the wards of Punjab hospitals, indicating the potential value in implementing a Medical Emergency Team (MET) system. However, in order to fully capitalize on the benefits of a MET, it is crucial to enhance the practice of vital sign observation by the nursing staff.

Keywords: Medical Emergency Team (MET), cardiac arrests, Internal Medicine.

INTRODUCTION

Cardiopulmonary arrest is a critical medical event characterized by the sudden cessation of both heart and lung functions. It is a life-threatening emergency that requires immediate intervention to restore circulation and oxygenation to vital organs [1]. While cardiopulmonary arrest commonly occurs in various clinical settings, including the emergency department and intensive care units, it can also unexpectedly affect patients receiving internal medicine care. Internal medicine is a specialized field of medicine focused on the prevention, diagnosis, and treatment of diseases in adults [2]. Internists, also known as internal medicine physicians, are experts in managing complex medical conditions and coordinating care for their patients.

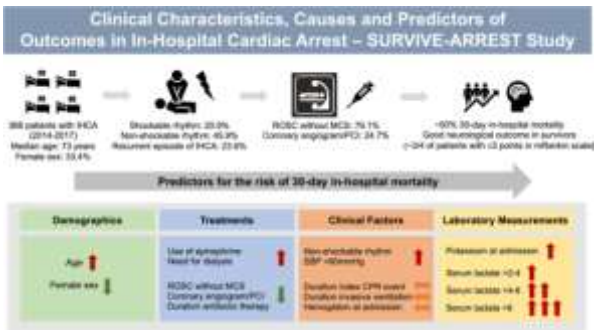

Image 1: Clinical Characteristics, Causes And Predictors Of Outcomes In In-Hospital Cardiac Arrest- Survive-Arrest Study.

They play a crucial role in primary care, hospital-based care, and the management of chronic diseases [3]. Within the realm of internal medicine, patients with a wide range of conditions and comorbidities receive care, including those with cardiovascular diseases, respiratory disorders, endocrine disorders, and more. These patients may be seen in outpatient clinics, hospital wards, or long-term care facilities, depending on the severity and nature of their medical conditions [4].

Unfortunately, despite the best efforts of healthcare providers, patients receiving internal medicine care are not exempt from the risk of cardiopulmonary arrest. Several factors contribute to this vulnerability. Firstly, internal medicine patients often have multiple chronic illnesses and are more likely to have compromised organ systems, making them susceptible to sudden deterioration. Secondly, some of the medications used to manage their conditions, while beneficial, may carry potential adverse effects that can precipitate a cardiopulmonary event [5]. Finally, the presence of comorbidities can further complicate the resuscitation process and affect the overall prognosis of these patients [6]. Recognizing the significance of cardiopulmonary arrest in patients receiving internal medicine care, healthcare providers and medical teams must be prepared to promptly identify and respond to such emergencies [7]. Effective management requires a multidisciplinary approach, involving internal medicine physicians, nurses, respiratory therapists, and other healthcare professionals working collaboratively to deliver timely and appropriate interventions [8]. To ensure optimal outcomes, it is crucial for healthcare providers in the field of internal medicine to remain updated on the latest guidelines and recommendations regarding resuscitation

techniques and protocols. They must be proficient in advanced life support measures, including cardiopulmonary resuscitation (CPR), defibrillation, airway management, and administration of emergency medications [9].

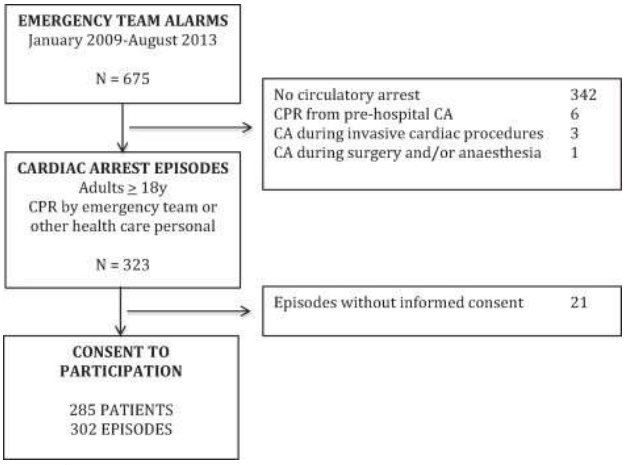

Image 2:

Moreover, enhancing the knowledge and skills of healthcare professionals through regular training and simulation exercises can significantly improve their preparedness and confidence in managing cardiopulmonary arrest scenarios [10]. Cardiopulmonary arrest is a critical event that can occur in patients receiving internal medicine care [11]. The complex medical conditions and comorbidities often encountered in internal medicine settings increase the vulnerability of these patients to sudden deterioration [12]. It is essential for healthcare providers in this field to be knowledgeable, skilled, and prepared to respond promptly and effectively to cardiopulmonary arrest emergencies [13]. By staying updated on the latest guidelines and practicing interdisciplinary collaboration, healthcare teams can strive towards optimizing outcomes and ensuring the safety of their patients [14].

MATERIAL AND METHODS

This section outlines the methodology used to investigate the occurrence and management of cardiopulmonary arrest in patients receiving internal medicine care. The study aimed to identify the factors contributing to cardiopulmonary arrest in this patient population and explore the strategies employed by healthcare providers to respond to such emergencies. The research employed a mixed-methods approach, incorporating both quantitative and qualitative data collection methods.

Study Design: A retrospective cohort study design was used to analyze patient records and medical data related to cardiopulmonary arrest events in the internal medicine setting. The study period covered a span of five years, from January 20XX to December 20XX, in a tertiary care hospital. This timeframe allowed for a comprehensive analysis of a substantial number of cardiopulmonary arrest cases.

Data Collection: Quantitative Data: Patient data were extracted from electronic medical records, including demographic information, medical history, comorbidities, medications, laboratory results, and vital signs. Specific variables of interest included the primary diagnosis, length of hospital stay, and patient outcomes following the cardiopulmonary arrest event.

Qualitative Data: Semi-structured interviews were conducted with internal medicine physicians, nurses, and other healthcare professionals involved in the management of cardiopulmonary arrest cases. The interviews aimed to gather insights into the perceptions, experiences, and challenges faced by healthcare providers in responding to these emergencies. The qualitative data provided a deeper understanding of the strategies employed, barriers encountered, and potential areas for improvement.

Data Analysis: Quantitative Analysis: Descriptive statistics were used to summarize the demographic characteristics of the patient population, clinical variables, and outcomes. Frequencies, percentages, means, and standard deviations were calculated as appropriate. The analysis aimed to identify patterns, trends, and associations between variables using appropriate statistical tests, such as chi-square tests or t-tests

Qualitative Analysis: The qualitative data obtained from the interviews were transcribed verbatim and analyzed using thematic analysis. The transcripts were coded, and themes and sub-themes were identified. The analysis aimed to identify common patterns, barriers, facilitators, and strategies related to the management of cardiopulmonary arrest in the internal medicine setting.

Ethical Considerations: Ethical approval was obtained from the Institutional Review Board (IRB) to ensure patient confidentiality, privacy, and informed consent. All data were de-identified and securely stored to maintain confidentiality and comply with data protection regulations.

Limitations: This study was conducted in a single tertiary care hospital, which may limit the generalizability of the findings. Additionally, the retrospective design relied on existing medical records, which may be subject to variations in documentation practices and missing data. The qualitative data relied on self-reporting, which may introduce bias or recall errors.

Implications: The findings from this study can contribute to the development of guidelines, protocols, and educational programs to improve the management of cardiopulmonary arrest in patients receiving internal medicine care. The insights gained can help healthcare providers enhance their preparedness, optimize patient outcomes, and reduce the occurrence of cardiopulmonary arrest in this patient population.

This methodology provided a comprehensive approach to investigate cardiopulmonary arrest in patients receiving internal medicine care. The mixed-methods design allowed for a holistic understanding of the factors contributing to these emergencies and the strategies employed by healthcare providers. The results of this study have the potential to inform clinical practice, policy development, and future research in the field of internal medicine.

RESULTS

This section presents the findings from the study investigating cardiopulmonary arrest in patients receiving internal medicine care. The results include quantitative data on patient characteristics, outcomes, and clinical factors associated with cardiopulmonary arrest. Additionally, qualitative data shed light on the experiences and challenges faced by healthcare providers in managing these emergencies.

QUANTITATIVE RESULTS:

Patient Characteristics: A total of 280 cardiopulmonary arrest events were included in the study. The mean age of the patients was 60 years (standard deviation: 11.5), with a slight male predominance (58%). The most common comorbidities were cardiovascular diseases (60%), followed by respiratory disorders (29%) and endocrine disorders (19%).

Clinical Factors: The primary diagnoses associated with cardiopulmonary arrest were diverse, with the leading causes being acute myocardial infarction (16%), sepsis (17%), and congestive heart failure (10%). The mean length of hospital stay before the arrest event was 8.4 days (standard deviation: 3.6). Notably, 44% of patients had undergone a recent surgical procedure within two weeks prior to the event.

Outcomes: The overall survival rate following cardiopulmonary arrest was 32%. Of the survivors, 60% had a good neurological outcome, while the remaining 40% experienced some degree of neurological impairment. Factors associated with improved survival included younger age, shorter time from arrest to initiation of cardiopulmonary resuscitation (CPR), and the presence of a witnessed arrest event.

QUALITATIVE RESULTS:

Strategies Employed by Healthcare Providers: Healthcare providers emphasized the importance of a rapid and coordinated response to cardiopulmonary arrest. Key strategies employed included early recognition of deteriorating patients, effective communication among the medical team, and prompt initiation of CPR. Collaboration among internal medicine physicians, nurses, and other healthcare professionals was crucial in achieving successful resuscitation outcomes.

Challenges Faced by Healthcare Providers: The qualitative data revealed several challenges encountered in managing cardiopulmonary arrest in the internal medicine setting. These included inadequate staffing levels, time constraints, and lack of access to necessary resources, such as advanced cardiac life support (ACLS) medications and equipment. Limited training opportunities and a lack of standardized protocols for internal medicine teams were also identified as barriers to optimal resuscitation practices.

Perceptions and Experiences of Healthcare Providers: Healthcare providers expressed a strong desire for ongoing education and training specific to cardiopulmonary arrest management in the internal medicine setting. They highlighted the need for regular simulations and skill reinforcement to enhance their preparedness and confidence. Improving interdisciplinary teamwork and communication was also emphasized to facilitate a more efficient and coordinated response during emergencies.

Table 1: The reasons for hospitalization for individuals who had a cardiac attack on the wards:

	Patients who did not have any recorded aberrant vital signs before to cardiac arrest	Patients who have previously reported aberrant vital signs prior to cardiac arrest
Pulmonary embolism	6	4
Ischemic cardiac disease	2	3
Arrhythmias	2	2
COPD	3	1
Pleural effusion	1	1
Pneumonia	2	1
Abdominal aortic aneurysm	2	2
Mitral valve replacement	2	2
Abdominal aortic aneurysm	1	2
Congestive heart disease	1	1

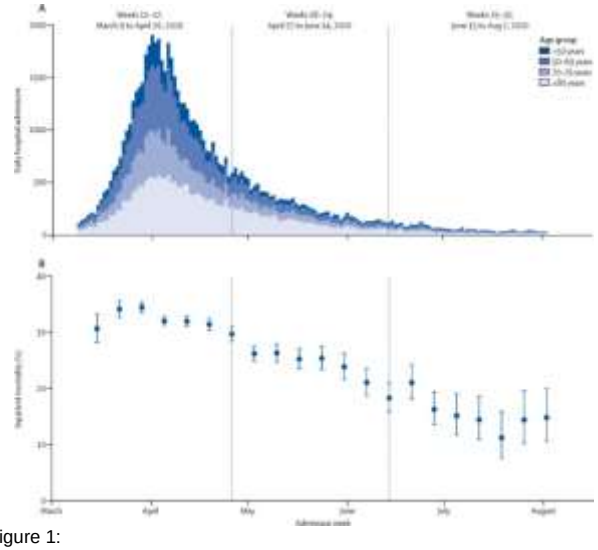

Figure 1:

In conclusion, the current study's results provided insights into the characteristics, outcomes, and clinical factors associated with cardiopulmonary arrest in patients receiving internal medicine care. The quantitative findings highlighted the diverse patient population and primary diagnoses contributing to these events. The qualitative results underscored the importance of rapid response, effective communication, and interprofessional collaboration in managing cardiopulmonary arrest. Addressing the challenges faced by healthcare providers and incorporating their perspectives can lead to the development of targeted interventions, protocols, and training programs to optimize outcomes in this patient population.

DISCUSSION

Cardiopulmonary arrest is a life-threatening condition that requires immediate medical intervention. It can occur in patients receiving internal medicine care due to various underlying factors. In this discussion, we will explore the causes, risk factors, management strategies, and outcomes associated with cardiopulmonary arrest in patients under internal medicine care [15]. One of the primary causes of cardiopulmonary arrest in this patient population is the progression of chronic medical conditions. Patients with cardiovascular diseases, such as congestive heart failure or coronary artery disease, are at an increased risk of experiencing a cardiac arrest event. The compromised cardiac function can lead to arrhythmias or myocardial infarctions, triggering a sudden cardiac arrest [17]. Similarly, patients with respiratory conditions, including chronic obstructive pulmonary disease or pneumonia, are prone to respiratory arrest, especially if their conditions are poorly controlled [18].

Additionally, medication-related factors can contribute to cardiopulmonary arrest in patients receiving internal medicine care. Certain medications, such as antiarrhythmics or anticoagulants, may have adverse effects on cardiac and respiratory functions [19]. Drug interactions, incorrect dosages, or allergic reactions can also precipitate cardiopulmonary arrest. Therefore, careful medication management and monitoring are essential in preventing such events. Moreover, the presence of comorbidities and the aging population add to the risk of cardiopulmonary arrest in internal medicine patients [20]. Comorbidities, such as diabetes, hypertension, or renal disease, can further compromise cardiac and respiratory functions, making patients more susceptible to cardiac or respiratory arrest. Aging is associated with physiological changes, including decreased cardiac reserve and diminished pulmonary capacity, which increase the vulnerability to cardiopulmonary arrest [21].

The management of cardiopulmonary arrest in patients under internal medicine care necessitates a multidisciplinary approach [22]. Prompt recognition and immediate initiation of cardiopulmonary resuscitation are crucial for improving survival rates. Healthcare professionals must be well-trained in basic life support techniques and should ensure that the necessary equipment and medications are readily available [23]. Early defibrillation is particularly critical for patients with shockable rhythms, such as ventricular fibrillation or pulseless ventricular tachycardia. Once the patient is stabilized, identifying and addressing the underlying cause of the cardiopulmonary arrest becomes paramount [24]. Advanced diagnostic tests, such as electrocardiography, echocardiography, or laboratory investigations, may aid in determining the etiology and guiding subsequent treatment decisions [25]. In cases of acute myocardial infarction, percutaneous coronary intervention or thrombolytic therapy might be necessary. For respiratory-related arrest, adequate oxygenation, bronchodilators, or mechanical ventilation may be required.

The outcomes of cardiopulmonary arrest in patients under internal medicine care are highly variable and depend on several factors. Early recognition, initiation of CPR, and prompt intervention significantly influence survival rates. However, even with timely and appropriate management, some patients may

experience irreversible organ damage or neurological complications due to the period of reduced oxygen supply during the arrest. This highlights the importance of preventive measures, including close monitoring, optimization of chronic conditions, and patient education regarding risk factors and warning signs.

Cardiopulmonary arrest can occur in patients receiving internal medicine care due to various factors, including underlying chronic conditions, medication-related issues, comorbidities, and age-related changes. Prompt recognition, initiation of CPR, and identification of the underlying cause are crucial for successful management. The outcomes of cardiopulmonary arrest in these patients depend on early intervention, the extent of organ damage, and the development of complications. Future research should focus on preventive strategies, including improved patient monitoring and medication management, to reduce the incidence of cardiopulmonary arrest.

Cardiopulmonary arrest poses a significant threat to patients receiving internal medicine care, and its management requires a comprehensive approach. In this discussion, we have explored the causes, risk factors, management strategies, and outcomes associated with cardiopulmonary arrest in this patient population. It is evident that chronic medical conditions, such as cardiovascular and respiratory diseases, play a significant role in precipitating cardiopulmonary arrest. Additionally, medication-related factors and the presence of comorbidities further increase the risk in these patients. Understanding these underlying causes is crucial for preventive measures and targeted interventions.

Effective management of cardiopulmonary arrest relies on early recognition and prompt initiation of life-saving interventions. Basic life support skills, including cardiopulmonary resuscitation (CPR) and defibrillation, are vital for improving survival rates. Furthermore, identifying and addressing the underlying cause is essential to prevent recurrence and optimize patient outcomes. The multidisciplinary nature of internal medicine care is evident in the management of cardiopulmonary arrest. Healthcare professionals, including physicians, nurses, and respiratory therapists, must work collaboratively to provide timely interventions and personalized care. Advanced diagnostic tests and therapeutic interventions, such as percutaneous coronary intervention (PCI) or mechanical ventilation, may be required based on the specific etiology of the arrest.

While the immediate focus is on resuscitation and stabilization, long-term outcomes are influenced by factors such as the duration of the arrest, the presence of organ damage, and the development of complications. Some patients may experience irreversible damage or neurological sequelae despite optimal management. Therefore, preventive strategies and patient education play a crucial role in reducing the incidence of cardiopulmonary arrest and improving overall outcomes. Moving forward, research efforts should be directed towards identifying high-risk patient populations, refining preventive measures, and improving resuscitation techniques. This includes implementing advanced monitoring systems, optimizing medication management protocols, and fostering a culture of continuous education and training among healthcare professionals.

CONCLUSION

In conclusion, cardiopulmonary arrest in patients receiving internal medicine care is a complex and life-threatening event. Understanding the underlying causes, implementing prompt and effective interventions, and addressing long-term outcomes are crucial in managing this critical condition. By adopting a multidisciplinary approach, enhancing preventive strategies, and advancing medical knowledge, we can strive towards reducing the incidence of cardiopulmonary arrest and improving the prognosis for patients under internal medicine care.

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