

## Atypical Presentation in Unstable Angina

Dilip Vyas<sup>1</sup>, Deepak Tolia<sup>2</sup>, Jitesh Tolia<sup>3</sup>

<sup>1</sup>Associate Professor, Department of General Medicine, Shantabaa Medical College & General Hospital Amreli, Gujarat

<sup>2</sup>Professor, Department of Radiology, Shantabaa Medical College & General Hospital Amreli, Gujarat

<sup>3</sup>Associate Professor, Department of Emergency Medicine, Pacific Institute of Medical Sciences, Udaipur, Rajasthan

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Corresponding author: Dr Dilip Vyas

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### Abstract

**Background and Aim:** About all individuals with acute myocardial ischemia experience unstable angina (UA) due to coronary atherosclerotic disease. There is little research on the clinical and demographic characteristics that predict outcomes in UA patients. For their cost-effective management, it is crucial to have a better understanding and characterization of the factors that lead to hospitalisation and determine how long a patient stays there. Our current investigation uses a nationally representative database to determine the prevalence and factors that contribute to prolonged hospitalisation in UA patients.

**Material and Methods:** Data were gathered from a 1-year prospective in the emergency department of the affiliated hospital. 100 patients who had been identified as having acute coronary symptoms participated in the trial. Depending on the type of their primary presenting symptom, patients were separated into three groups. Group 1: Myocardial ischemia's "typical" symptoms. Group 2: "Atypical" chest pain has been defined as being mild, brief, non-classical in appearance, not exactly similar to previous cardiac symptoms, and Group 3: Dyspnea: Sudden, inexplicable shortness of breath is the main complaint.

**Results:** At the time of admission, 70 patients (14%) experienced dyspnea, 30 (6%) had atypical chest pain, and 400 patients (80%) had usual chest pain. The resting heart rate, systolic and diastolic blood pressure, as well as the levels of blood sugar and creatinine at the time of admission, were all considerably higher in patients with dyspnea. Female gender, faster heart rate, diabetes mellitus, renal failure, high Killip class, and late presentation were all predictors of the absence of normal chest pain at presentation.

**Conclusion:** Because atypical presentation negatively affects ACS patients' care and outcomes, we shouldn't let it influence our management decisions, especially for high-risk patients with conditions including diabetic mellitus, renal failure, advanced age, and COPD.

**Keywords:** Coronary Atherosclerotic Disease, Dyspnea, Myocardial Ischemia, Unstable Angina.

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### Introduction

Patients with acute coronary syndromes typically report with chest discomfort as their

primary clinical symptom. Acute coronary syndrome patients who initially appear

without chest discomfort in substantial numbers are at risk of receiving less aggressive treatment. Acute coronary syndrome unusual symptoms may be better identified, which could speed up therapy. In order to better understand atypical presentations of the illness, Canto and colleagues did a retrospective review to assess the percentage of patients admitted with unstable angina pectoris who arrived with atypical symptoms [1,2].

Unstable angina is not a particular disease like pneumococcal pneumonia; rather, it is a clinical state similar to hypertension. Simple clinical criteria, such as the presence or absence of ischemic chest pain while at rest, ECG abnormalities, and biochemical indicators of myocardial injury during and after ischemia episodes are frequently used to categorise unstable angina [1]. Although these clinical characteristics are useful in assessing prognosis and are frequently used to determine the extent of treatment, they offer little insight into the syndrome's underlying causes [3-5].

About of individuals with acute myocardial ischemia experience unstable angina as a result of coronary atherosclerotic disease. The most frequent cause of unstable angina is coronary artery constriction brought on by a nonocclusive thrombus that forms on a disturbed atherosclerotic plaque. Coronary artery vasospasm is a less frequent cause. This vasospasm is brought on by endothelial or vascular smooth malfunction [6-8].

Obstacles to blood flow that prevent the myocardium from receiving enough oxygen are the focus of unstable angina. The aorta receives initial perfusion straight from the heart, followed by the coronary arteries, which nourish each individual part of the heart. The circumflex and left anterior descending arteries will emerge from the left coronary artery. This will eventually separate into much smaller branches. Moreover, the

right coronary will split into smaller branches. When the myocardium's blood supply is restricted, unstable angina develops. This block can most frequently result from intraluminal plaque development, intraluminal thrombosis, vasospasm, and high blood pressure. Frequently, a combination of these serves as the provocateur [9,10].

There has not been much research on the clinical and demographic characteristics that predict outcomes in UA patients. For their cost-effective management, it is crucial to have a better understanding and characterization of the factors that lead to hospitalisation and determine how long a patient stays there [11]. Moreover, this would make it possible to decide when, in these UA or lowrisk NSTEMI-ACS patients, an invasive technique is most appropriate. Our current investigation uses a nationally representative database to determine the prevalence and factors that contribute to prolonged hospitalisation in UA patients.

### **Materials and Methods**

The data were collected from a 1 year prospective in the department of emergency medicine, linked hospital. The study recruited 500 patients who were diagnosed with acute coronary symptoms. The purpose of the study was to characterise ACS patients' characteristics, clinical care, and hospital outcomes. Prior to the study's launch, the institutional ethical committee was made aware of it and given its approval. The American College of Cardiology clinical data standards served as the foundation for the diagnosis of the various kinds of ACS and the establishment of data variables. The attending physician at the accident and emergency department gathered information on the patient's clinical characteristics, electrocardiographic results, biochemical markers, and treatment.

### **Study groups**

The registry included a predefined definition of symptoms, and data were gathered prospectively. Patients were separated into three groups for this analysis based on the type of their primary presenting symptom, regardless of electrocardiographic alterations. Group 1: Myocardial ischemia is characterised by a number of "typical" symptoms, including (1) precordial chest discomfort, pain, heaviness, or fullness that may radiate to the arm, shoulder, back, neck, jaw, epigastrium, or other areas; (2) symptoms made worse by stress or physical exertion; (3) symptoms that may be relieved by rest or nitroglycerin use; and (4) symptoms like shortness of breath, diaphoresis, weakness, nausea

Group 2: "Atypical" chest pain has been defined as not being severe, not lasting, not classical in presentation, and not exactly resembling prior cardiac symptoms. It has also been defined as a burning, sharp, pleuritic, positional pain or discomfort that is reproducible on palpation of the chest wall and localizable by one finger, as well as pain or discomfort in parts of the upper body other than the chest, such as the arms, epigastrium, shoulder, and neck.

Group 3: Dyspnea: The primary symptom of dyspnea is abrupt, unexplained shortness of breath. Patients who primarily experienced cardiac arrest, loss of consciousness, palpitations, generalised body pains, excessive weariness, or epigastric discomfort were not included in the current analysis.

### Statistical Analysis

Using continuous variables with median and interquartile ranges, the three groups' differences in patient characteristics, treatment, and outcomes were compared. Chi square tests are used to compare percentage summaries of categorical variables. In a subanalysis, groups with atypical chest pain and dyspnea were combined into one group (without the presence of normal chest pain)

and contrasted with the group with typical chest pain. For patients in the three groups, step-wise multivariate logistic regression was used to find independent predictors of in-hospital mortality that were adjusted for baseline covariates (age, sex, diabetes mellitus, and blood pressure). Furthermore, multivariate analysis was employed to identify the factors that predicted the nature of the presenting symptoms. A  $<0.05$  p-value was regarded as statistically significant.

### Results

The study enrolled 500 consecutive individuals who met the inclusion and exclusion criteria and had acute coronary symptoms. At the time of admission, 70 patients (14%) experienced dyspnea, 30 (6%) had atypical chest pain, and 400 patients (80%) had usual chest pain.

Compared to those who had typical angina, those who arrived with unusual pain or dyspnea were older. The likelihood of them being female and having more cardiovascular risk factors was higher. Patients with dyspnea exhibited higher values of blood sugar, creatinine, and systolic and diastolic blood pressure, as well as a significantly higher resting heart rate, at the time of admission. Compared to the group with usual chest discomfort, those with dyspnea typically delayed seeking medical attention by more than 12 hours. Patients with chronic obstructive pulmonary disease (COPD) had a higher rate of atypical ACS presentation as compared to those without COPD.

Predictors of the absence of typical chest pain at presentation included female gender, higher heart rate, diabetes mellitus, renal failure, high Killip class, and late presentation. Based on the patients' presenting symptoms, various medicinal and invasive treatments were provided to them after hospital admission. Less commonly was in-hospital coronary angiography conducted on individuals who had no chest discomfort.

Those without chest pain had worse in-hospital outcomes than those who had conventional angina due to considerably greater rates of heart failure, cardiogenic shock, stroke, and mortality. Following the elimination of confounding variables, the absence of normal chest discomfort was linked to greater fatality rates. When compared to other categories, patients who presented with dyspnea had an even greater mortality rate. Also, the fact that this group's length of hospitalisation was more pronounced underlines the effect of age, sex, diabetes mellitus, and renal failure on the mortality rate depending on whether the patients had the usual chest discomfort or not.

### Discussion

Acute coronary syndrome (ACS), or more recently non-ST-elevation acute coronary syndrome, is a spectrum of ischemic heart disease that includes unstable angina (UA) (NSTEMI-ACS). Non-ST-elevation myocardial infarction (NSTEMI) is the other important component of NSTEMI-ACS (NSTEMI). The presence of a cardiac biomarker, which indicates myocardial necrosis and injury despite the absence of electrocardiographic alterations, distinguishes UA from NSTEMI. One of the most frequent initial symptoms in patients with unstable angina is still chest discomfort. The most current estimate states that each year, 550,000 hospital admissions in India are brought on by unstable angina [12,13].

The National Center for Health Statistics previously claimed that UA was one of the most prevalent illnesses requiring hospital admission in the United States, accounting for more than 3 million inpatient days. Under the general heading of acute coronary syndrome, unstable angina can be classified along a continuum. The biggest cause of death worldwide continues to be this public health problem, which everyday has an impact on a significant section of the

population. Regarding the patient's care and management, it's critical to distinguish this from other causes of chest discomfort, such as stable angina [1,14,15].

Although that patients rely on healthcare professionals to distinguish between different causes of chest discomfort, providers should be aware of the signs and symptoms of acute coronary syndrome. Patients frequently arrive at the emergency room. Acute coronary syndrome, however, can also be seen outside of a hospital. In order to evaluate unstable angina and the other variations of acute coronary syndrome, a substantial amount of research has been done over the years to identify the most suitable and efficient treatment options.

One of the largest observational studies comparing the effect of symptoms present at the time of ACS manifestation on patient outcomes is the current study. Atypical ACS presentation, which can range from 4.7% to 33%, was documented in multiple studies and was linked to inferior outcomes.

The type and quantity of nociceptive afferent nerves that are stimulated during ACS determine the type and intensity of symptoms, and these afferent impulses may also stimulate efferent impulses in the autonomic nervous system to cause symptoms. The disparities in ACS presentation across the sexes may be related to the prevalence of certain neuropathies.

Neuropathies are more common as people get older, their BMI rises, and they have a history of diabetes. Autonomic neuropathy is a common complication of diabetes mellitus and typically affects the vagal nerves before the sympathetic nerves. 50% of the patients with atypical presentations were diabetic, and this population subset had a greater mortality risk, especially when dyspnea was the primary symptom. In between 26 and 49% of ACS patients, dyspnea can be the only noticeable symptom. When patients in the

current study reported with dyspnea, the death rate in STEMI and NSTEMI increased three times. Individuals with dyspnea who presented had a higher heart rate and systolic blood pressure, a poorer left ventricular ejection fraction, and more in-hospital problems, such as cardiogenic shock. They were also more likely to be older, female, and to have cardiovascular risk factors. The findings led to the conclusion that dyspnea is the main presenting symptom linked to poorer hospital outcomes.

### Conclusions

Atypical presentation has a negative impact on the care and outcomes of ACS patients, thus it shouldn't be a deciding factor in our management decisions, especially for high-risk patients including those with diabetes, renal failure, advanced age, and COPD. Undertreatment of ACS patients who don't have classic angina is common. A significant additional predictive factor for patient risk categorization may be the clinical presentation.

### References

1. Kumar A., Cannon C. P. In Tille. Elsevier., 2009.
2. Storrow A. B., Gibler W. B. J. A. O. E. M. Chest pain centers: diagnosis of acute coronary syndromes. 2000; 35: 449-461.
3. Braunwald E. J. C., Unstable angina: an etiologic approach to management. 1998; 98: 2219-2222.
4. Plaques P. J. C. Unstable Angina. 1998; 98: 2219-2222.
5. Members W. C., Anderson J. L., Adams C. D., Antman E. M., Bridges C. R., Califf R. M., Casey Jr D. E., Chavey W. E., Fesmire F. M., Hochman J. S. J. C. 2012 ACCF/AHA focused update incorporated into the ACCF/AHA 2007 guidelines for the management of patients with unstable angina/non-ST-elevation myocardial infarction: a report of the American College of Cardiology

- Foundation/American Heart Association Task Force on Practice Guidelines. 2013; 127: e663-e828.
6. Goyal, A.; Zeltser, R.: Unstable angina. In StatPearls. StatPearls Publishing., 2022.
7. Michaels A. D., Chatterjee K. J. C. Angioplasty versus bypass surgery for coronary artery disease. 2002; 106: e187-e190.
8. Shahjehan R. D., Bhutta B. S. Coronary artery disease. In StatPearls. StatPearls Publishing, 2022.
9. Amsterdam E. A., Kirk J. D., Bluemke D. A., Diercks D., Farkouh M. E., Garvey J. L., Kontos M. C., McCord J., Miller T. D., Morise A. J. C. Testing of low-risk patients presenting to the emergency department with chest pain: a scientific statement from the American Heart Association. 2010; 122: 1756-1776.
10. Bolli R. J. C. Myocardial 'stunning' in man. 1992; 86: 1671-1691.
11. Bartlett J. G., Dowell S. F., Mandell L. A., File Jr T. M., Musher D. M., Fine M. J. J. C. I. D. Practice guidelines for the management of community-acquired pneumonia in adults. 2000; 31: 347-382.
12. Hussein M. S., Ibrahim S. H. J. D. J. O. M. The prediction role of TIMI score in correlation with coronary angiogram to determine the coronary artery disease severity and extent in patients presenting with Non-ST Elevation Acute Coronary Syndrome. 2022; 22: 29-44.
13. Sheel B. K., Badiuzzaman M., Haque T. Rahman H., Biswas A. K., Khan S. R. J. B. H. J. Association between Myocardial Performance Index (Tei-Index) and Severity of Coronary Artery Disease in Patients with Non-ST Segment Elevation Acute Coronary Syndrome. 2022; 37: 16-26.
14. Gimbel M. E., Tavenier A. H., Bor W., Hermanides R. S., de Vrey E. Heestermans T., Gin M. T. J., Waalewijn

- R., Hofma S., den Hartog F. J. J. O. C. M. Ticagrelor versus clopidogrel in older patients with NSTEMI-ACS using oral anticoagulation: a sub-analysis of the POPular Age Trial. 2020; 9: 3249.
15. Kristensen A. M. D., Pareek M., Kragholm K. H., Sehested T. S. G., Olsen M. H., Prescott E. B. J. C. Unstable angina as a component of primary composite endpoints in clinical cardiovascular trials: pros and cons. 2022; 147: 235-247.