

ASSESS THE SIGNIFICANCE OF METABOLIC ACIDOSIS IN THE PATIENTS WITH ACUTE STEMI AT A SELECTED HOSPITAL

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Abstract

Coronary Artery Disease (CAD) is the leading cause of death globally where India has the highest burden. It causes 3 million deaths per year, accounting for 25% of all mortality in India. Hospitals statistics reveal that 20-25 % of all medical admissions are due to Coronary artery disease (WHO, 2017). Acute myocardial infarction (AMI) is a cardiac emergency. The clinical diagnosis of AMI requires an integrated assessment of the history especially with reference to chest pain along with some combination of indirect evidences of myocardial infarction using biochemical, electrocardiographic, and imaging modalities. In the United States, nearly one million patients suffer from AMI per year (AHA, 2004). **Objectives:** i. To assess the arterial blood gases among the patients with acute STEMI. ii. To assess the physiological parameters and biochemical markers with acute STEMI. iii. To assess the prognosis of the patients with acute STEMI. iv. To associate acid base status (Metabolic acidosis) with acute STEMI. v. To associate the physiological parameters and biochemical markers with acute STEMI. vi. To correlate metabolic acidosis and acute STEMI. **Methodology:** Research approach: quantitative approach, a descriptive research design for 43 samples by Non- probability convenient sampling technique. **Results:** It shows that increased mortality rate was associated with low pH and bicarbonate levels of the patients with acute STEMI had shown statistically significant association with STEMI at $p < 0.05$

INTRODUCTION

Coronary Artery Disease (CAD) is the leading cause of death globally where India has the highest burden. It causes 3 million deaths per year, accounting for 25% of all mortality in India. Hospitals statistics reveal that 20-25 % of all medical admissions are due to Coronary artery disease (WHO, 2017). Acute myocardial infarction (AMI) is a cardiac emergency. The clinical diagnosis of AMI requires an integrated assessment of the history especially with reference to chest pain along with some combination of indirect evidences of myocardial infarction using biochemical, electrocardiographic, and imaging modalities. In the United States, nearly one million patients suffer from AMI per year (AHA, 2004).

ST segment elevation myocardial infarction (STEMI) is characterized by myocardial ischemia that results in persistent ST segment elevation on electrocardiogram (ECG) and subsequent release of biomarkers of myocardial damage. Increased biomarkers alone in the absence of ST segment elevation constitute Non-ST segment elevation MI (NSTEMI) (Santanu et al, 2017).

ST segment elevation myocardial infarction most commonly occurs when thrombus formation results in complete occlusion of a major epicardial coronary vessel. The most serious form of acute coronary syndromes, ST-Elevated Myocardial Infarction is a life-threatening, time-sensitive emergency that must be diagnosed and treated

promptly via coronary revascularization, usually by percutaneous coronary intervention (Healio, CAD-STEMI, 2019).

NEED FOR THE STUDY:

Healthcare personnel are keenly aware of the limitations of present laboratory investigations, particularly in the early phases of an AMI. The initial electrocardiogram (ECG) is diagnostic in only about 50% of AMIs. The investigator had come across more number of deaths, related to acute myocardial infarction with the ST-segment elevation, during the clinical exposure and when analysed the arterial blood gas levels were found to have decreased pH levels and bicarbonate levels, as metabolic acidosis. This phenomenon is also supported by “Metabolic acidosis and acute myocardial infarction” (Gandhi et al, 2015). Hence, in this study, the investigator aimed to test the significance of the metabolic acidosis in the patients with acute STEMI.

PROBLEM STATEMENT

ASSESS THE SIGNIFICANCE OF METABOLIC ACIDOSIS IN THE PATIENTS WITH ACUTE STEMI AT A SELECTED HOSPITAL.

OBJECTIVES

1. To assess the demographic variables of the acute STEMI patients. 2. To assess the arterial blood gases among the patients with acute STEMI. 3. To assess the physiological parameters and biochemical markers with acute STEMI. 4. To assess the prognosis of the patients with acute STEMI. 5. To associate acid base status (Metabolic acidosis) with acute STEMI. 6. To correlate metabolic acidosis and acute STEMI.

METHODS AND MATERIALS USED

The research approach used in the study was quantitative approach using a descriptive research design. The study was conducted at selected company with 43 samples. The samples were selected using non- probability Convenient sampling technique. The tool used for the study was demographic variable, vital signs, arterial blood gas analysis, biomarkers, and duration of the stay was used to collect the data. Informed consent was obtained and the data was analyzed using descriptive statistics and inferential statistics.

RESULTS

Major finding of this study shows that, 38(88.37%) of the samples had ST elevation in ECG of more than 2.5 mm, also 32(74.41%) had Systolic BP of <90 mmHg, and 29(67.44%) had mean arterial pressure of 65-74 mmHg. In association of acute STEMI with metabolic acidosis, chi-square value shows statistically significant at $p < 0.05$. The increased mortality rate was associated with low pH and bicarbonate levels of the patients with acute STEMI. Most of the samples with the systolic blood pressure

CONCLUSION

The study results conclude, that Arterial blood gas analysis is a simple and cost effective method in identifying the hydrogen ion concentration in the blood and the anaerobic metabolism which causes the lactate accumulation in the system. It also helps the healthcare professionals to early identification and treat the cause to improve the prognosis of the patient with acute STEMI. The metabolic acidosis, had shown to have a significant correlation in patients with acute STEMI and their prognosis.

RECOMMENDATION

Similar studies can be done with cardiac markers such as cardiac enzymes to predict the outcome of the acute STEMI patients.

Similar studies can be done with Killip class to predict mortality.

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