ORIGINAL ARTICLE

Prevalence of hypokalemia in AMI patients: An observational study

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ABSTRACT
Background: The term "reinfarction" is used for an Acute Myocardial infarction (AMI) that occurs within 28 d of a Myocardial infarction. Hence; we planned the present study to assess the prevalence of hypokalemia in AMI patients. **Materials & methods:** The present study included assessment of prevalence of hypokalemia among AMI patients. A total of 25 AMI patients were included in the present study. Along with them, 25 healthy controls were also included. Collection of fresh blood samples was done in all the patients. All the blood samples were sent to central laboratory. An auto analyzer was used for evaluating the mean serum potassium levels. **Results:** Mean potassium levels among the subjects of the AMI group was found to be 3.8 mEq/L, while mean potassium levels among the subjects of the control group were found to be 4.2 mEq/L respectively. Prevalence of hypokalaemia among the AMI group was found to be 40 percent. **Conclusion:** Serum potassium level alterations do occur to some level in AMI patients; thereby implicating their role in the pathogenesis of the diseases.
Key words: Acute myocardial infarction, Hypokalemia

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INTRODUCTION

Myocardial infarction (MI) is a term used for an event of heart attack which is due to formation of plaques in the interior walls of the arteries resulting in reduced blood flow to the heart and injuring heart muscles because of lack of oxygen supply.[1-3] The symptoms of MI include chest pain, which travels from left arm to neck, shortness of breath, sweating, nausea, vomiting, abnormal heart beating, anxiety, fatigue, weakness, stress, depression, and other factors. The term "reinfarction" is used for an acute MI (AMI) that occurs within 28 d of a MI. Based on the type of assay used, a range of elevated cTn values, indicative of myocardial injury with necrosis, may be seen in patients with a heart failure (HF) syndrome.[4,5] In stable heart failure patients, the median concentration of hs-cTnT is 12 ng/L, which is very close to the 99th percentile URL of 14 ng/L for this assay.[6]
Hence; we planned the present study to assess the prevalence of hypokalemia in AMI patients.

MATERIALS & METHODS

The present study was conducted in the department of cardiology and it included assessment of prevalence of hypokalemia among AMI patients. A total of 25 AMI patients were included in the present study. Along with them, 25 healthy controls were also included. Exclusion criteria for choosing the patients of the study group were as follows:

--Patients more than 70 years of age,
--Patients with presence of any other systemic illness,
--Patients with presence of any known drug allergy

Collection of fresh blood samples was done in all the patients. All the blood samples were sent to central laboratory. An auto analyzer was used for evaluating the mean serum potassium levels. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Chi- square test was used for assessing the level of significance. P-value of less than 0.05 was taken as significant.

RESULTS

In the present study, a total of 50 subjects were analyzed. Among these 50 subjects, 25 patients were categorized under the AMI group and the remaining 25 were categorized under the control group. Mean age of the patients of the AMI group and the control group was 39.5 and 40.2 years respectively. There were 15 males and 10 females in the AMI group, and 14 males and 11 females in the control group. Mean potassium levels among the subjects of the AMI group was found to be 3.8 mEq/L, while mean potassium levels among the subjects of the control group were found to be 4.2 mEq/L respectively. Prevalence of hypokalaemia among the AMI group was found to be 40 percent.

Table 1: Demographic data

Parameter	AMI group	Control group
Mean age (years)	39.5	40.2
Males	15	14
Females	10	11

Table 2: Serum potassium status

Parameter	AMI group	Control group
Serum potassium levels (mEq/L)	3.8	4.2

Table 3: Prevalence of hypokalaemia in AMI patient group

Parameter	Prevalence- N (%)
Hypokalaemia	10 (40%)

DISCUSSION

The elderly with acute myocardial infarction (AMI) have been reported to present with more atypical symptoms. AMI is associated with significantly higher mortality in the elderly compared with the young, yet the elderly are treated less aggressively than the young.[7, 8] Thrombolytic therapy has the greatest effect in the elderly even though there is an increased risk of haemorrhagic stroke. The benefits of aspirin, angiotensin converting enzyme (ACE) inhibitors and beta-blockers in AMI have been substantiated in numerous trials, but their usage in elderly AMI patients may be lower than in younger patients.[8, 9] In the present study, a total of 50 subjects were analyzed. Among these 50 subjects, 25 patients were categorized under the AMI group and the remaining 25 were categorized under the control group. WaliM V et al assessed the alterations in the serum electrolytes with special reference to serum sodium and potassium in cases of AMI and studied the correlation of serum sodium and potassium in the severity and outcome of AMI. Hundred people were included in study divided equally in study and control groups. Study group comprised confirmed diagnosis of recent onset of AMI. The blood samples of both the groups were analysed for Serum electrolytes (Na+, K+) by flame-photometry (Bio-Lab Diagnostic kit). There was statistically significant decrease in sodium and potassium levels in across all age groups & in both sexes of study group compared to control group. Significant high level of sodium was observed in AMI patients who are smokers and AMI patients with Diabetes whereas the level was low in AMI patients with hypertension. Potassium levels were low in AMI patients with Diabetes whereas the change was insignificant in association with smoking and hypertension. Decrease in sodium level was due to hypoxia and ischaemia, which increase the permeability of sarcolemma to sodium whereas decrease in potassium level was influenced by the catecholamine levels which are elevated in early acute myocardial infarction.[10]

In the present study, mean age of the patients of the AMI group and the control group was 39.5 and 40.2 years respectively. There were 15 males and 10 females in the AMI group, and 14 males and 11 females in the control group. Mean potassium levels among the subjects of the AMI group was found to be 3.8 mEq/L, while mean potassium levels among the subjects of the control group were found to be 4.2 mEq/L respectively. Prevalence of hypokalaemia among the AMI group was found to be 40 percent. Pourmoghaddas A et al determined the relationship between serum potassium level and frequency of ventricular tachycardia in early stages of AMI. Ina cross-sectional study on 162 patients with AMI in the coronary care unit (CCU) of Nour Hospital (Isfahan, Iran), the patients' serum potassium level was classified into three groups: 1) K<3.8 mEq/l, 2) 3.8≤K<4.5 mEq/l and 3) K≥4.5 mEq/l. The incidence of ventricular tachycardia in the first 24 hours after AMI was determined in each group by chi-square statistical method. The frequency of ventricular tachycardia in the first 24 hours after AMI in K< 3.8 mEq/l, 3.8≤K<4.5 mEq/l and K≥4.5 mEq/l groups were 19.0%, 9.6% and 9.9% respectively. The high frequency of this arrhythmia in the first group as compared with the second and the third group was statistically significant. Hypokalemia increased the probability of ventricular tachycardia in patients with AMI. Thus, the follow up and treatment of hypokalemia in these patients is of special importance.[11]

CONCLUSION

Under the light of above obtained results, the authors concluded that serum potassium level alterations do occur to some level in AMI patients; thereby implicating their role in the pathogenesis of the diseases.

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