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Hypokalemia in acute MI patients coming to cardiology unit at HMC Hospital Peshawar: A single-center study

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Abstract---Objective: This study aimed to assess the incidence of Hypokalemia among patients hospitalized in the at the Department Of Cardiology Hmc Peshawar, for the treatment of acute [MI]. Study design and setting A single-center study at, Department Of Cardiology Hmc Peshawar. Material & Methods: the study was conducted in department of Cardiology Hmc Peshawar from January 01, 2021, to 06 June, 2021) A total of 414 patients participated in this trial—detailed backstory, standard probing, etc. ECGs confirmed a heart attack diagnosis. Hypokalemia was checked for by drawing 5 mL of venous blood from each patient and sending them to the hospital lab. All laboratory tests were supervised by the same consulting pathologist with at least five years of experience. Hypokalemia is diagnosed when the serum potassium level falls below 3.6 mmol/L. Results: The average age of the patients in this study was 63, with a standard deviation of 07.04 years; 240 (58%) were male, and 174 (42%) were female. Analysis of individuals with and without Hypokalemia revealed that 84 (19%) had Hypokalemia and 372 (90%) did not. Conclusion: Based on the findings of our study, we found that 10% of patients with acute[MI]

who'd been hospitalized at the GKMC Sawabi Cardiology Department had Hypokalemia.

Keywords---smoking, hypokalemia, acute MI, diabetes mellitus, hypertension.

Introduction

Acute M.I. is a symptom of acute coronary syndrome, caused by (coronary artery disease). Acute M.I. causes death and disability globally [1]. Acute[MI] kills 3 million people annually In the U.S., 685,000 MIs are projected yearly [2]. MI drains financial and human resources from established and developing healthcare systems internationally Longevity increases Population growth and increased access to medical care in developing nations and diagnostic services globally contribute to the worldwide rise of AMI. AMI electrolyte abnormalities [3]. Electrolyte imbalances are either a cause or a result of acute MI. Scientists and clinicians monitoring MI patients' blood electrolyte levels have noticed a link. They're crucial for cardiac membrane electrophysiology [4]. Electrolyte abnormalities and autonomic nervous system activity are blamed for abrupt cardiac mortality following an acute MI [5]. (death within 1 hour). Changing potassium homeostasis increases mortality and morbidity after a[MI]. Ventricular tachycardia, fibrillation, and cardiac arrest are more typically connected to hypokalemia [6]. Hypokalemia and hyperkalemia increase in-hospital and long-term mortality and morbidity in MI patients. Potassium's involvement in myocyte membranes may be responsible for its influence on cardiac arrhythmias in MI [7]. Serum potassium should be 3.7 to 7.1 mmol/L. Hypokalemia occurs when serum potassium levels are less than five mmol/L. 97% of the body's 3,500 mmol of potassium is within cells[8]. Sodium potassium ATPase regulates intracellular potassium, whereas aldosterone and vasopressin govern extracellular potassium [9]. Due to its function in the cardiac action potential repolarization phase, potassium deprivation may enhance myocardial automaticity and excitability, increasing ventricular arrhythmia susceptibility[10]. Chronic Hypokalemia in hospitalized [MI] patients has been studied. Blood potassium should be between 4 and 4.5 mmol/L [11]. Hypokalemia incidence in acute[MI] ranges from 6.8% to 23.0% This study seeks to determine the prevalence of Hypokalemia following[MI] in our community, given the increased incidence and prevalence of the illness. We haven't studied the incidence rate in our hospitalized population. Local doctors might better serve patients if they understood this condition's Frequency. They'll be more prepared and able to make an early diagnosis, benefiting their patients[12].

Materials and Methods

The department of Cardiology Hmc peshawar conducted a single-center study. This 6-month research included 414 MI patients. Both sexes and 28-80-year-olds participated. Renal Function tests, a list of steroid users, abdominal ultrasound, chest x-ray, and other diagnostic procedures may help diagnose Cushing syndrome, PCOS, or ascites. Analyzed were blood pressure, urine R/E ratios, and 24-hour urine protein. Nephrotic patients may detect protein loss. Patients on

lipid-lowering drugs or with acute myocardial ischemia couldn't participate. Electrocardiogram and patient history showed acute MI. Hypokalemia was measured in 5 mL of venous blood from each subject. A 5-year-experienced board-certified pathologist monitored all lab tests. Hypokalemia occurs below [3.5] mmol/L. A standard form collected age, gender, MI type, BMI, hypertension, diabetes, smoking status, marital status, employment, and country of residence. Research findings are reliable since exclusion criteria were followed. SPSS 20 descriptively analyzed all pro forma data. Means and standard deviations were calculated using weight, height, and BMI. Gender, MI type, hypertension, diabetes, smoking, socioeconomic level, domicile, and Hypokalemia were calculated. We presented a full picture of Hypokalemia's implications using age, gender, MI subtype, BMI, hypertension, diabetes, smoking status, marital status, education level, and zipcode. A chi-square test after stratification was significant (P 0.05).

Results

The average age was 63, and the SD was 6.03 years. The gender ratio revealed that 60% of the patients were men (264), whereas 40% were women (150). The average body mass index (BMI) was 26 kg/m², with a standard deviation (S.D.) of 4.18 kg. Patients' smoking habits were evaluated, with statistically significant differences between smokers and non-smokers (160/36%) and non-smokers and non-smokers (273/64%). Results showed that 241 individuals (77%) had hypertension, whereas only 96 patients (21%) had normal blood pressure. Analysis of patients with diabetes mellitus revealed that 252 (57%) were diabetic and 182 (41%) were not. As shown in table one.

Table [01]: Inclusion criteria characteristics of patients

[Variables]	[Frequency]	[%age]
1Mean Age (Years)	6.03 ±6.03	-
1Mean BMI (Kg/m)	26±4.06	-
1Gender		
1Male	240	58%
1Female	174	42%
1Smoking Status		
1Yes	160	35%
1No	274	65%
1Co-morbidities		
1HTN	338	77%
1Diabetes Mellitus	252	55%

Out of 414 the total 281 patients (or 68%) were found to have STEMI, whereas 132 patients (or 32%) were found to have NSTEMI. (No. 1) Diagram

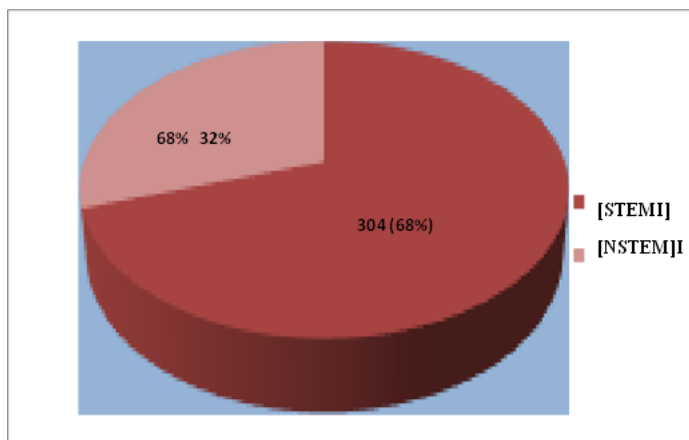


Figure 1: Types of [MI]

(40) patients (10%) were found to have Hypokalemia, whereas 372 patients (90%) did not. (No. 2 Figure)

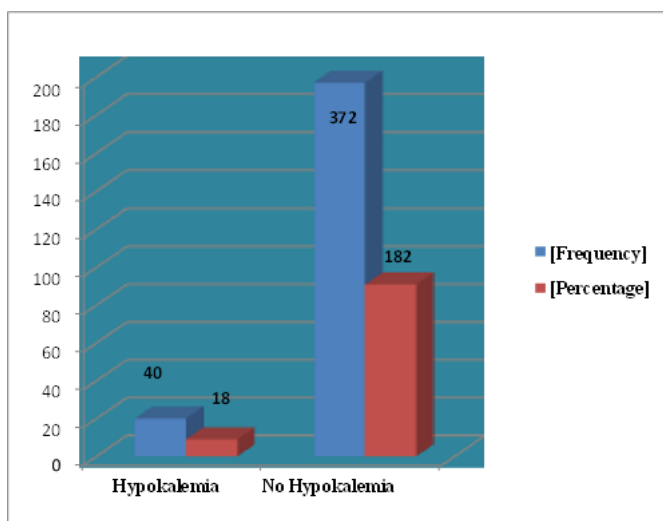


Figure 2: Frequency of Hypokalemia

Table [02-08] shows the stratification of Hypokalemia based on [age, gender], type of MI, body mass index, hypertension, and diabetes mellitus.

Table [02]: Hypokalemia Stratification Age wise

[Hypokalemia]	31- 42 years	42-61 years	62-80 years	Total
[Yes]	04	18	18	40
[No]	40	168	186	376
Total	44	186	204	414

[P value was 0.9682]

Table [03]: Understanding the difference Hypokalemia Complexes In Terms of Gender Balance

[Hypokalemia]	Male	Female	Total
Yes	24	16	40
No	240	154	376
Total	264	170	414

[P value was 0.9682]

Table [04]: Stratagems for Classifying Hypokalemia, Bmi

Hypokalemia	< 26 Kg/m2	> 26 Kg/m2	Total
YES	18	22	40
NO	172	222	394
Total	95	122	414

P value was 0.9182

Table [05]: Classification of Hypokalemia Strata Regarding Smoking

Hypokalemia	Yes	No	Total
YES	14	26	40
NO	146	248	396
Total	160	274	414

P value was 0.8650

Table [06]: Pattern of Hypokalemia Cure Hypertension

Hypokalemia	Yes	NO	Total
YES	32	8	40
NO	306	88	396
Total	240	96	414

The p value was 0.8205

Table [07]: Arrangement of Hypokalemia concerning Diabetes Mellitus

Hypokalemia	Diabetic	Nondiabetic	Total
YES	24	16	40
NO	228	166	396
Total	252	182	414

P value was 0.8521

Table [08]: Classification of Hypokalemia concerning Type Of Mi

Hypokalemia	.Stemi	.Nstemi	Total
YES	28	12	40
NO	276	118	396
Total	304	130	414

P value was 0.9820

Discussion

MI occurs on a spectrum of CAD and is a subtype of the acute coronary syndrome. [MI], or acute MI, is one of the main causes of mortality and disability worldwide [13]. About three million people die annually from unexpected cardiac causes, and experts believe that acute [MI] is to blame in most cases [14]. One research estimates that annually in the United States, there will be a total of 680,000 new cases of MI diagnosed. The burden that MI puts on wealthy and developing nations' healthcare systems is enormous. MI has serious physiological, psychological, and legal consequences for both individuals and society as a whole. Increases in life expectancy and access to healthcare and diagnostics throughout the globe likely contribute to the growing incidence and prevalence of acute [MI] [15]. Recent years have shown an increase in the incidence and prevalence of acute MI due partly to both. Patients in our research had a mean age of 63 (SD = 6.03), with 240 (58%) being male and 174 (42%) being female. The average body mass index was 26 kg/m², with a standard deviation of 4.08 pounds; 160 (36%) of the patients were smokers, whereas 274 (64%) were not. Patients with hypertension numbered 240 (77%), and those without it were 96 (20%) [16]. The Percentage of diabetic patients was 59.1%, whereas the Percentage of nondiabetic patients was 41% (152 out of 304). Forty (10%) of the individuals were found to have Hypokalemia, whereas 396 (90%) were found to be hypokalemic [17].

Consistent findings were also found in a different research conducted by Patil S et al., which found that 6.4%-22% of patients with acute [MI] also had Hypokalemia [18]. Another research by Iqbal R et al. found similar outcomes with 396 patients (58% male and 42% female). The average age of the patients was 54.84 years. There was a wide variation in serum potassium levels (from 2.05 to 5.05 mmol/L), with a mean value of 4.0 ± 0.2 mmol/L. Ten percent of patients were found to have Hypokalemia. Comparable findings were found in different research by Grodzinsky et al., which found that out of 37,579 patients with acute [MI], 840 were on dialysis. Those who did not undergo dialysis were 21% more likely to have hyperkalemia (K > 4.0 mEq/L) than those who did. Patients. Roughly 10% of individuals had moderate-severe hyperkalemia (maximum K > 5.05 mEq/L). Increases in maximum potassium levels were associated with a sharp rise in mortality. Once max K 5.05 mEq/L, in-hospital mortality topped 12%, independent of dialysis status. Maximal kilocalorie intake is associated with an increased chance of dying, and this association remained even after controlling for other factors. Patients with several hyperkalemic readings (as opposed to a single value) also had a higher in-hospital death rate [18].

Conclusion

According to our findings, 10% of patients with acute [MI] admitted to the Cardiology Department, GKMC, Sawabi had Hypokalemia.

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