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AN ASSESSMENT OF SERUM MAGNESIUM (Mg++) LEVELS AMONG AMI (ACUTE MYOCARDIAL INFRACTION) PATIENTS ALONG WITH HEALTHY AND DISEASED PATIENTS COMPARISON

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Abstract:

Background: *In normal functioning of the body, Magnesium plays a very important role. Among intracellular cations, second, most frequently found in Magnesium. An essential role is played by magnesium in the generation of energy and maintenance of electrolyte balance. In maintaining cardiovascular balance, Mg++ has an unforgettable role. Besides neuromuscular role, preserving of vascular tone, excitation-contraction coupling, transport of Ca++ and K+ across the plasma membrane and blood coagulation are also associated with Magnesium.*

Objectives: *The objective of this study was to determine the levels of serum Mg++ in patients of acute myocardial infarction (AMI). To make the comparison of patients attending at the hospital with normal people was also included in the objective of this study.*

Patients and Methods: *The current research was organized Services Hospital, Lahore (February to October 2018). Total selected patients were 125. Among these, the patients with the first episode of AMI were 88. On the basis of age, patients were categorized into A, B and C. For the purpose of comparison, 37 normal people were also included in the research.*

Results: *In all the sub-groups, the presence of hypomagnesaemia (P-Value <0.001) was reported. In post AMI complexities, hypomagnesemia is a valuable contributing factor. So, its presence was observed in all the groups. The restorative quantity should not be real. It should be according to the need of every patient. Complexities and death rate due to AMI are high.*

Conclusion: *It is concluded that in all groups A, B and C the presence of hypomagnesemia is observed. It is considered that Magnesium serum should be determined in each case of AMI patients. Mg++ should be provided to patients when required.*

Keywords: *Hypomagnesaemia, Magnesium, Mg++, Mg/dl, Serum and AMI.*

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INTRODUCTION:

In normal functioning of the body, Magnesium plays a vital role. Among intracellular cations, the second most frequently found is magnesium. An essential role is played by Magnesium in the generation of energy and maintenance of electrolyte balance. Transport of Ca++ and K+ across the plasma membrane is also associated with Magnesium. Role in the presentation of serum sodium, serum calcium, serum potassium and smooth muscle tone in the vessel wall is played by Magnesium [1]. Shortage of Mg++ cause the deficiency of K+ and unmanageable potassium feeding. Results of hypokalemia are identified and reported on a large scale. At present, clinical awareness is increased related to the scarcity of Mg++ and as a result a shortage of potassium (K+) [2]. Hypomagnesemia and AMI are associated with each other. It is due to the occurrence of a transfer of Mg++ from extracellular to intracellular segments [2]. As the AMI initiates, the amount of Mg++ may remain the same. But in the first 24 – 48 hours, there noticed retardation in extracellular Mg++. The starting part of post AMI period is hypomagnesemia. It is a very serious situation. Normally, it results in re-infection and ventricular tachyarrhythmia's and at once cardiac death [3]. Renal system and gastrointestinal tract are main structures for management of Mg++. Parathormone manages the level of Mg++ in extracellular segments. Hypomagnesemia and hypocalcemia may be present in association with each other [4 – 8]. The life of patient of AMI is in danger if hypokalemia and hypomagnesemia are established. It resulted in ventricular tachyarrhythmia and surprising cardiac death [9 – 13].

The usefulness of Mg++ is related to direct local effect of Mg++. Also, the infarct size decreases due to increased perfusion. Cardiac arrhythmias are controlled by Magnesium [14 – 18]. It is concluded by the experimental models of AMI that myocardial injury is not decreased seriously after reperfusion and interval of 45 minutes [19 – 25]. The objective of this study was to determine the levels of serum Mg++ in patients of acute myocardial infarction (AMI). TO make the comparison of patients attending at the hospital with normal people was also included in the objective of this study.

PATIENTS AND METHODS:

The current research was organized Services Hospital, Lahore (February to October 2018). Total selected patients were 125. Among these, the patients with the first episode of AMI were 88. On the basis of age, patients were categorized into A, B and C. For the purpose of comparison, 37 normal people were also included in the research. Before the management of serum Mg++, 4cc whole blood sample was recorded. Samples were centrifuged at 4000 RPM for 2 – 3 minutes. Serum was isolated. By employing calorimetric technique using calmagite, serum was isolated. ECG of the patients was also recorded.

RESULTS:

In all the sub-groups, the presence of hypomagnesaemia (P-Value <0.001) was reported. In post AMI complexities, hypomagnesemia is a valuable contributing factor. So, its presence was observed in all the groups. The restorative quantity should not be real. It should be according to the need of every patient. Complexities and death rate due to AMI are high. Patients were categorized on the basis of their age. As compared to controls, the serum levels in subgroup A was remarkably lower (P < 0.001). After six hours of admission, these levels become lower (P-Value <0.001). Serum magnesium levels in subgroups A, B and C at admission of AMI patients are illustrated in the given tabular data. Moreover, the levels of Mg++ serum in subgroup B and subgroup C were also remarkably lower (P < 0.001).

Table – I: Age Wise Normal and Sub-Group Values Comparison

Age Group (Serum Mg++)	Normal (37)		Sub Group		P-Value
	Mean	±SD	Mean	±SD	
20 - 40 Years	2.014	0.11	1.037	0.13	< 0.001
40 - 60 Years	2.014	0.11	1.063	0.59	
Above 60 Years	2.014	0.11	0.89	0.22	

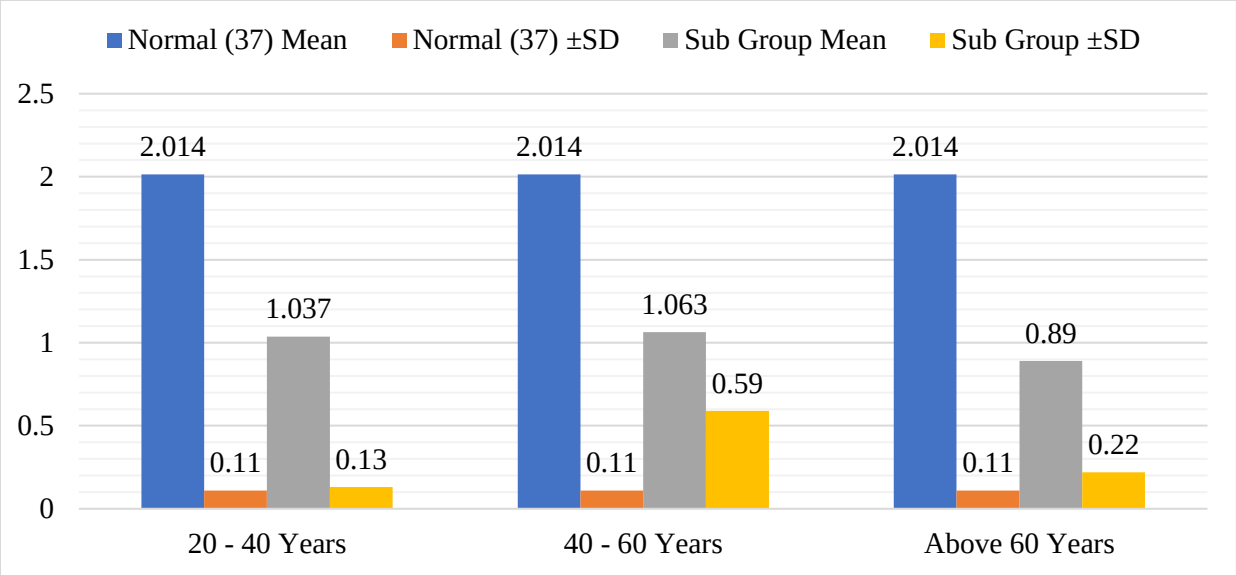
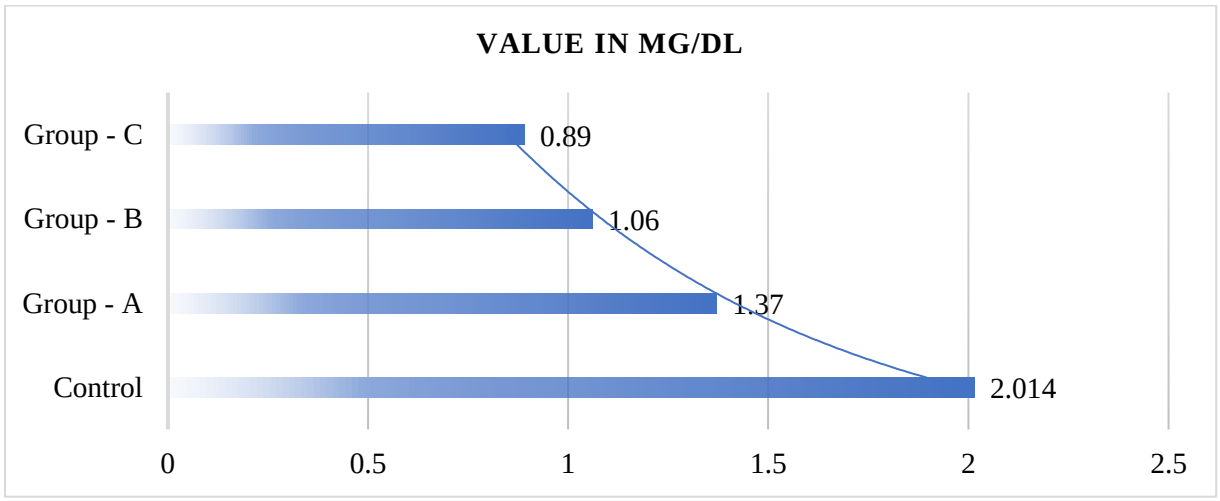


Table – II: Comparison of Serum Magnesium Values

Group	Value in mg/dl
Control	2.014
Group – A	1.37
Group – B	1.06
Group – C	0.89



DISCUSSION:

For post-AMI complexity, the main associated factor is hypomagnesaemia. Many international studies illustrated that in patients of AMI, the levels of Mg++ are low. After the initiation of AMI, these levels continuously fall [22]. As compare to controls, the mean value of serum Mg++ levels is remarkably lower in all the three groups in our study ($P < 0.001$). From the present study, it is obvious that cardiac balance is maintained by Mg++. It is also shown that post-AMI arrhythmias and myocardial damage may occur due to deficiency of Magnesium [8]. It is now considered that cardiac problems are a result of hypomagnesemia. It is considered that Magnesium serum should be determined in each case of AMI. Mg++ should be provided to patients when required. Due to this danger

can be reduced related to AMI complexities and cardiac death at once [23]. The remarkable decrease is also observed in cardiac arrhythmias after Na+, K+, Ca++ and Cl, the fifth main electrolyte in the human body is Magnesium [6].

CONCLUSION:

According to the results of this study, the significance of measuring serum Mg++ levels is highlighted by the high incidence of hypomagnesemia in cases of AMI. For avoiding serious complexities, there is a requirement of its correction in every patient with AMI.

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