

# Serum calcium and magnesium levels in patients with acute gastroenteritis

<sup>1</sup>Dr. MA Reshamwala, <sup>2</sup>Dr. Manish Maheshbhai Khokhar, <sup>3</sup>Dr. Kartikeya Sharma

<sup>1</sup>Associate Professor, Department of General Surgery, Dr. NYT Asgaonkar Institute of Medical Sciences, Karjat, Maharashtra, India

<sup>2</sup>Assistant Professor, Department of Medicine, MP Shah Medical College, Jamnagar, Gujarat, India

<sup>3</sup>Assistant Professor, Department of General Surgery, United Medical College and Hospital, Prayagraj, Uttar Pradesh, India

## Corresponding Author:

Dr. Kartikeya Sharma ([kartikeyasharma60@yahoo.com](mailto:kartikeyasharma60@yahoo.com))

## Abstract

**Background:** Though the earlier studies reported that there will be loss of magnesium and calcium ions in the patients with acute gastro enteritis, the exact measure was not provided.

**Objective:** The present study was undertaken to measure the levels of the calcium and magnesium in the patients of acute gastroenteritis. This information helps to plan adequate treatment in these patients.

**Materials and methods:** A total of 50 patients with acute gastroenteritis aged more than 18 years including both male and females were part of the study after obtaining the written, voluntary informed consent. Unwilling participants were excluded from the study. Patients with any severe complications were also excluded from the study

**Results;** Out of fifty participants, 20 participants were males and 30 participants were females. The range for calcium was found from 6.7 to 10.7 mmol/l. Majority of the patients have the calcium levels in the range of 7.7-8.7 mmol/l. The range for magnesium is 0.1-3.1 mg/dl. Majority of the patients have level of magnesium in the range of 2.1-3.1 mg/dl.

**Conclusion:** Significant decline in the serum calcium and magnesium levels was observed in the patients with gastro enteritis. The study results support the results of earlier studies. The study recommends the need of future studies with involving multiple centers and multiple samples to plan adequate treatment strategies for management of diarrhea cases and to prevent death of these patients.

**Keywords:** Gastroenteritis, calcium, magnesium, diarrhoea, treatment

## Introduction

Inflammation of the gastro intestinal tract leads to the diarrhea which is one of the most common causes of morbidity and mortality in clinical setting <sup>[1]</sup>. Acute gastroenteritis can be caused by the infections of bacteria or virus or by the protozoan. It leads to the irritation of the gastro intestinal tract and leads to loss of excess amounts of water and electrolytes leading to dehydration <sup>[2]</sup>. In this condition, fluid therapy must be provided in time and also the electrolytes have to be restored to save the life of patient <sup>[3]</sup>. The important electrolytes that are listed to be lost are sodium, potassium, chloride and bicarbonates <sup>[4]</sup>. As the body

homeostatic mechanism tries to restore the loss of sodium with the help of aldosterone, it sends out potassium and magnesium ions outside the cells. This leads to loss of potassium and magnesium levels in the body [5]. Though the earlier studies reported that there will be loss of magnesium and calcium ions in the patients with acute gastro enteritis, the exact measure was not provided. Hence, the present study was undertaken to measure the levels of the calcium and magnesium in the patients of acute gastroenteritis. This information helps to plan adequate treatment in these patients.

## Materials and methods

**Study design:** Observational study.

**Study participants:** A total of 50 patients with acute gastroenteritis aged more than 18 years including both male and females were part of the study after obtaining the written, voluntary informed consent. Unwilling participants were excluded from the study. Patients with any severe complications were also excluded from the study.

**Methods:** After the recruitment, patients underwent thorough physical examination. Then the dermatographic data was obtained followed by detailed data collection. Blood samples were collected by standard procedures mentioned in the literature. The collected blood samples were centrifuged and the supernatant was used to estimate the blood calcium and magnesium levels.

**Ethical considerations:** The study was approved by the institutional human ethical committee. Voluntary informed consent was obtained from all the participants.

**Statistical analysis:** Data was analyzed using SPSS 20.0. Data was represented in frequency and percentages.

## Results

Out of fifty participants, 20 participants were males and 30 participants were females. Table no 1 presents the distribution of the participants according to level of calcium. The range for calcium was found from 6.7 to 10.7 mmol/l. Majority of the patients have the calcium levels in the range of 7.7-8.7 mmol/l. Table no 2 presents the distribution of the participants according to level of magnesium. The range for magnesium is 0.1-3.1 mg/dl. Majority of the patients have level of magnesium in the range of 2.1-3.1 mg/dl.

**Table 1:** Distribution of the participants according to level of calcium

Serum calcium level (mmol/l)	Number of participants (N=50)
6.7-7.7	10 (20%)
7.7-8.7	18 (36%)
8.7-9.7	12 (24%)
9.7-10.7	10 (20%)

Data was presented as frequency and percentage

**Table 2:** Distribution of the participants according to level of magnesium

Serum magnesium level (mg/dl)	Number of participants (N=50)
0.1-1.1	8 (16%)
1.1-2.1	30 (60%)
2.1-3.1	12 (24%)

Data presented was frequency and percentage

## Discussion

Imbalance of electrolytes is severe issue and leads to death of the patients if not diagnosed properly and treated adequately [6]. Electrolytes play a major role in the body homeostasis [7]. Restoration of lost electrolytes is lifesaving therapy to restore body homeostasis. Though the earlier studies reported that there will be loss of magnesium and calcium ions in the patients with acute gastro enteritis, the exact measure was not provided. Hence, the present study was undertaken to measure the levels of the calcium and magnesium in the patients of acute gastroenteritis. This information helps to plan adequate treatment in these patients. Out of fifty participants, 20 participants were males and 30 participants were females. Table no 1 presents the distribution of the participants according to level of calcium. The range for calcium was found from 6.7 to 10.7 mmol/l. Majority of the patients have the calcium levels in the range of 7.7-8.7 mmol/l. Table no 2 presents the distribution of the participants according to level of magnesium. The range for magnesium is 0.1-3.1 mg/dl. Majority of the patients have level of magnesium in the range of 2.1-3.1 mg/dl. The study results explain that there is a decline in the levels of both the serum magnesium and serum calcium in the patients with acute gastroenteritis. This is a serious condition as body losses large quantities of water and electrolytes. Hence, there is a strong need to restore the lost water and electrolytes in the body [8]. The fluid therapy is lifesaving therapy in these patients to save from severe dehydration. Along with the fluids the lost electrolytes also has to be restored [9-10]. In the present study it was clear that there is loss of the magnesium and calcium along with other electrolytes. The study supports the results of earlier studies. However, the sample size of the study was small to draw the generalizations.

## Conclusion

Significant decline in the serum calcium and magnesium levels was observed in the patients with gastro enteritis. The study results support the results of earlier studies. The study recommends the need of future studies with involving multiple centers and multiple samples to plan adequate treatment strategies for management of diarrhea cases and to prevent death of these patients.

**Conflicts of interest:** None declared.

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