A Comparison of Serum Magnesium Concentration Among Cystic Fibrosis Patients Groups of a Brazilian Reference Center

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Abstract

Magnesium has recently been explored as important mineral for the health of CF patients. The aim was detect the rates of hypomagnesaemia and to compare the serum magnesium of the CF patients treated in a reference center for CF. Methods: It was a retrospective study, survey of patients’ records treated in a reference center for CF. It was included the first dosage of serum magnesium collected from January of 2011 to march of 2013, was also collected age at magnesium serum collection (0 to 10 years old, > 10 to 20 years old, > 20 to 50 years old), pancreatic insufficiency and serum magnesium value. A comparison of serum magnesium between the groups, according with age and pancreatic insufficiency, was analyzed by Kruskal-Wallys Test and the significance level adopted was 5 % (p < 0.05). Results: Total of 50 patients, with media (SD) of serum magnesium was 1.67 mEq /L (± SD 0.21), without significant difference enter groups. Conclusion: although, the median of serum magnesium closer to the lower levels of the reference values might be an alert to try oral magnesium supplementation.

INTRODUCTION

Cystic fibrosis (CF), a rare and lethal autosomal recessive disease more prevalent among Caucasians caused by mutations in the CF transmembrane conductance regulator (CFTR). This protein function as a channel of chloride, producing thick mucus with a consequent poor digestion and intestinal absorption, bronchial lesions and lung infections and electrolyte disturbance by excessive losses in sweat [1].

The proper nutrition improves survival and major interest has been given to improve the serum levels of fat soluble vitamins and electrolytes as sodium, chloride, etc. However, magnesium has recently been explored as important mineral for the health of CF patients and there are scientific affirmations that magnesium deficiency may be present in CF patients, but the exact mechanism is unknown [2,3]. Moreover, a systematic review revealed that magnesium presented decreases with age in cystic fibrosis and affects more than half of the patients with advanced Disease [4].

OBJECTIVES

The aim was detect the rates of hypomagnesaemia and to compare the serum magnesium of the CF patients groups, according age and pancreatic sufficiency, treated in a reference center for CF, localized in Ribeirão Preto city, São Paulo state, Brazil.

METHODS

It was a retrospective study, survey of patients’ records treated in a reference center for CF, localized in Ribeirão Preto city, São Paulo state, Brazil. We included only the first dosage of serum magnesium collected from January of 2011 to march of 2013, by the method of flame spectrophotometry and the other variables collected was age at magnesium serum collection (0 to 10 years old, > 10 to 20 years old, > 20 to 50 years old), pancreatic insufficiency (Yes/No) and serum magnesium value (RV = 1.4 to 2.3 mEq / L). A comparison of serum magnesium between the groups, according with age and pancreatic insufficiency was performed. Kruskal - Wallys test was used to analyze the statistical difference enter groups and the significance level adopted was 5 % (p < 0.05).

RESULTS

There were 50 patients, 54% (27) male gender. According with age, the frequency of <10 years old; 10 to 20 years old; 20 to 50 years old was 48% (24); 38% (19) and 14% (7), respectively. Pancreatic Insufficiency was present in 80% (44).
Nobody had hyponatremia and the minor serum magnesium value was 1.45 mEq/L. However, the media (SD) of serum magnesium was 1.67 mEq /L (± SD 0.21). The statistic comparison values enter the groups is represented in Table (1).

**DISCUSSION**

Although the patients with CF presented normal values of serum magnesium, the media (SD) 1.67 mEq /L (± 0.21), was next to the minimal reference value. The same was observed before [5], but this result can sound as a warning, because magnesium is an intracellular ion and there is only 1% of the body’s magnesium store in the blood. There are affirmations that serum magnesium tests do not reflect the body’s magnesium store and that they measure only short-term intake variations. The evidences supporting that magnesium is primarily concentrated in muscles and bones, and then concentrations in erythrocytes do not reflect the body’s magnesium store [5,6].

Pancreatic insufficiency and age groups did not were important to characterize differences serum magnesium levels differences (p>0.05), but all presented media next low reference value. Nevertheless, it is important to note that most of our patients were included in the group of less than 10 years old, so the advanced disease could not was expressed yet.

We also did not detect hypomagnesaemia in CF patients and most studies are necessaries, but the level observed can be an important highlight, considering that a previous study showed children and adolescents with CF who received conventional treatment in combination with oral magnesium supplementation, achieved significant improvement in functional status of the respiratory musculature and better clinical results.

**CONCLUSION**

Serum hypomagnesemia was not observed in our CF patients and also there were no differences of serum magnesium concentration between the different groups with CF. Although, the median of serum magnesium closer to the lower levels of the reference values might be an alert to try oral magnesium supplementation.

**REFERENCES**


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Disclosure of Interest: None Declared