American Journal of Biomedical Science & Research

www.biomedgrid.com

ISSN: 2642-1747

Mini Review

Importance of Lowered Ionized Magnesium Concentrations in Elderly Hypertensives

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To Cite This Article: *K Kisters, Importance of Lowered Ionized Magnesium Concentrations in Elderly Hypertensives. 2020 - 7(4). AJBSR. MS.ID.001172. DOI:* 10.34297/AJBSR.2020.07.001172.

Received: February 14, 2020; **Published:** February 24, 2020

Introduction

In recent publications a magnesium deficiency in elderly is up to 50%, depending on co-morbidity, drugs and nutritional status [1,2]. On the other hand, it is well known that a magnesium insufficiency is a pathogenic factor in the development of primary hypertension [2-11]. In this context calcium magnesium antagonism, sodium magnesium antiport, disturbed vitamin D metabolism or disturbed magnesium channels (TRPM 6 and 7) are of special interest [1-7]. For these reasons magnesium metabolism was of interest in elderly hypertensives. Ionized magnesium is the active form and was measured additionally. Up to now it is not clear whether there is a correlation between plasma or serum magnesium concentrations and ionized magnesium content.

Therefore, we investigated 45 essential hypertensives patients with normal renal function. None of the patients received diuretics or magnesium. No diabetics were included. The age of patients was beyond 65 years, 23 persons were male, 22 females.

Measurements of magnesium were performed either in serum (Cobass, Roche, Germany) or ionized in blood (NOVA, Rödermark, Germany).

In serum magnesium concentrations only 1 person had values below 1.5 mg/dl, all other elderly hypertensives had a normal serum magnesium concentration.

In contrast ionized magnesium concentrations was significantly decreased in 15 of 45 patients, showing values below 0,5 mmol/l ($p<0.01$), that is 30%.

In addition, no correlation between total serum and ionized blood magnesium exists (ns., Pearson or Spearmann rank test, p value 0.91 and 0.41) (Figure 1). Blood pressure was controlled and below 150/90 mmHg. The data presented here show that there is no correlation between serum and ionized blood magnesium content. This is of special importance as a normal serum magnesium content doesn´t exclude a deficiency of ionized magnesium. As ionized magnesium is the vasoactive form of magnesium in the body and acts on vessels, it is more useful to determine ionized magnesium concentrations in assessing body magnesium stores. In elderly hypertensives under blood pressure control nearly 30% showed an ionized magnesium deficiency despite normal serum magnesium values.

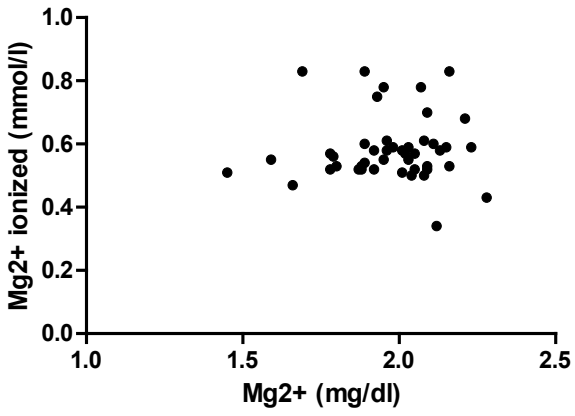

Figure 1: Serum magnesium and ionized magnesium concentrations in 45 elderly hypertensives.

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