

Serum Magnesium Level in Hypertensive Patients

WALI MUHAMMAD MAHERI*, ISRAR AHMED AKHUND**, IKRAM DIN UJJAN***, IMRAN ALI SHAIKH***, RASHID AHMAD MEMON***, MUHAMMAD FAROOQ****

Present study was planned to study the serum magnesium levels in hypertensive patients. Study was conducted at LUMHS hospital, Jamshoro. Fifty known cases of hypertension and same numbers of healthy controls were examined. Non significant difference was found when both groups were compared statistically. We conclude that there was no relation between serum magnesium level and hypertension.

Key Words: Serum Magnesium, Hypertension.

Ischemic hearts disease (IHD) is a leading cause of death in most industrial and western world. A number of risk factors are associated with IHD. Major being: hypercholesterolemia, hypertension, cigarette smoking, diabetes mellitus and stress. Hypertension is an important accelerator of the atherosclerotic process and it frequently accompanies adult ischaemic heart disease¹. Hypertension is associated with an increased risk of clinical cardiovascular complication due to atherosclerosis and atheroma develops earlier in these patients^{2,3}. There is significant difference between the severity of atherosclerotic lesions in hypertensive and non-hypertensive subjects⁴.

Magnesium, a biologically essential cat ion, has recently received considerable attention in clinical medicine, especially with regard to the role of its depletion in cardiovascular pathophysiology. Magnesium is the fourth most abundant action in the body and the second most abundant intra cellular cat ion, next to potassium⁵. Many reports have appeared in recent years, discussing association between serum magnesium levels and hypertension⁶.

SUBJECTS AND METHODS

Study was conducted in the department of medicine, LUMHS hospital, Jamshoro, for the period of nine months. Fifty known cases of hypertension were selected. The information about their name, age, sex, duration of their illness and blood pressure, smoking habits, any family history of cardiovascular disease were recorded. Patients with diuretic therapy, thyroid abnormalities, liver failure, renal failure or alcoholics were excluded from the study. Fifty healthy controls were selected with no preexisting cardiovascular disease.

*LUMHS, Jamshoro, **Muhammad Medical College, Mir Purkhas, ***ISRA University, Hyderabad, ****Blood Bank, Lady Aitchison Hospital, Lahore.

Correspondence to: Dr. Wali Muhammad Maheri, Assistant Professor Physiology Department, LUMHS, Jamshoro.

A single casual supine blood pressure was obtained. Blood samples of patients and healthy controls were drawn to determine serum magnesium levels. Statistical analysis was done by using student's t-test to see the level of significance.

RESULTS

Results of control subjects and hypertensive patients are given in table 1 and Fig 1.

Table 1: Comparison of serum magnesium level in control subjects and patients with hypertension

| Serum Magnesium level (mg/dl) | Control Group | Patients Group |
|-------------------------------|-----------------|-----------------|
| Mean \pm SD Value | 2.94 \pm 0.05 | 2.83 \pm 0.10 |
| Total Subjects | 50 | 50 |

STATISTICAL ANALYSIS

Control Group Vs Patients Group $p > 0.05$ (NS)

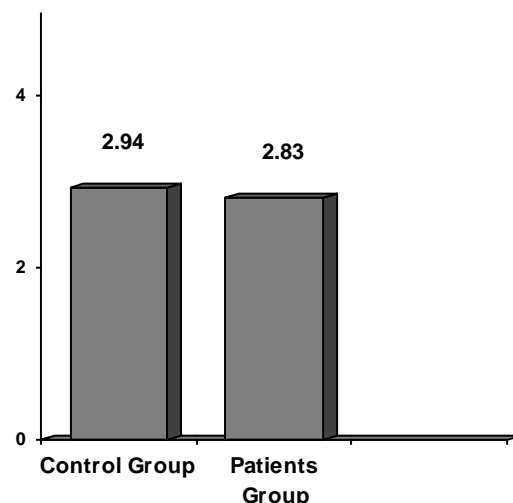


Fig 1: Comparison of serum magnesium level in control subjects and patients with hypertension

DISCUSSION

In present study, it was observed that the serum magnesium levels in patients with hypertension and controls are within normal limits. There fore this study suggests no relationship between serum magnesium levels and blood pressure in patients of hypertension. Therefore, this study is in the favour of works done by Whelton and Klag (1989)⁹, Rinner *et al* (1989)¹¹, Cappuccio *et al* (1985)⁶ and Herzog (1985)¹³.

Association between serum magnesium and blood pressure have yielded conflicting results. Hvarfner *et al* (1987)⁷, found a positive association between serum magnesium and blood pressure in 58 hypertensive patients studied in Uppsala, Sweden. The relation between serum magnesium and blood pressure has also been examined by using data from national health and nutrition survey, no association was identified between serum magnesium and systolic blood pressure⁸. Similarly, data from a community based cross sectional study of elderly whites in Baltimore provided no evidence of an association between serum magnesium and blood pressure⁹. Petesen *et al* (1977)¹⁰ reported a significant correlation between serum magnesium levels and systolic blood pressure. Rinner *et al* (1989)¹¹ studied Dutch population, and found no relation between serum magnesium and blood pressure.

Altura *et al* (1984)¹² reviewed the under lying mechanism. It has been postulated that when concentration of extra cellular magnesium is decreased, calcium influx is enhanced.

This study is not in favour of the study done by Hvarfner *et al* (1987)⁷ who found high serum magnesium levels in hypertensive patients. Also, study of Petesen and co-workers in (1977)¹⁰ reported decreased levels in hypertensive patients. It is suggested that further clinical studies are proposed to clarify idea about serum magnesium level in hypertensive patients.

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