



STUDY OF SERUM MAGNESIUM IN DIABETES MELLITUS AND CORRELATION WITH ITS MICROVASCULAR COMPLICATIONS

Dr. R. Umashankar PG, Dept of General medicine

Dr. C. Ramakrishnan Professor of General medicine

Dr. Suresh kanna Assistant professor, General medicine.

ABSTRACT

AIM: The prevalence of diabetes mellitus is on a rising trend. Hypomagnesemia has been reported to occur with increased frequency in patients with type 2 diabetes mellitus. It is frequently overlooked and under treated. We aim to study serum magnesium in diabetes mellitus and correlation with its microvascular complications.

KEYWORDS :

INTRODUCTION

Diabetic mellitus is a renowned epidemic in the world with nearly 70% of the people with diabetes live in developing countries. The largest numbers are in the Indian subcontinent (65 million) and China. Rates of non communicable diseases like diabetes mellitus have risen in the recent decades and are likely to continue as India's population ages and urbanises. The largest numbers with diabetes are in the 40 to 59 age group (132 million in 2010) which is expected to rise further. The prevalence of diabetes has risen from 30 million in 1985 to 382 million in 2013. It is estimated that prevalence may rise to 592 million by the year 2035 according to current trends

MATERIALS AND METHODS

100 patients with diabetes mellitus, irrespective of the age and sex, who were admitted in general medicine ward, were randomly selected based on the following inclusion and exclusion criteria.

Inclusion Criteria

Patients who get admitted in general medical ward with Diabetes Mellitus based on history or medical records.

Exclusion Criteria

1. Chronic diarrhoea (Loose stools more than 4 weeks)
2. Patients with chronic renal failure (based on GFR)
3. Patients on diuretic therapy for more than one month.
4. Patients with history of alcohol abuse as reported by patient or care taker.

In our study out of 100 diabetic patients 14 (92.86%) out of these diabetic nephropathy patients 13 patients were low serum magnesium level. Presence of normal serum magnesium level in diabetic nephropathy in our study was low (1.72%). Thus the association between the hypomagnesemia and nephropathy in diabetic patient was found to be statistically significant with the P value of 0.001.

DISCUSSION

Many studies have proven beyond doubt the association between the presence of hypomagnesemia and diabetes mellitus; it has also been proven that hypomagnesemia has been associated with increased incidence of complications in diabetics; hence I found it worthy to take up this study in our settings

Diabetic Retinopathy & Hypomagnesemia

In the 100 patients we had, 35 patients were found to have retinopathy, among whom 27 had hypomagnesemia (75.86%); the percentage of hypomagnesemic patients who had retinopathy was 67.5%; the normomagnesemic patients had only 8% of retinopathy; the p value indicating the association was 0.0001 which was statistically significant; studies which show similar results as ours are McNair et al 16, De walk HV et al 17, Hatwal A, Gujral AS et al 18.

Diabetic Neuropathy & Hypomagnesemia

Only 4 patients had neuropathy but all 4 had hypomagnesemia in our study; hypomagnesemia and presence of neuropathy were statistically correlating as shown by the p value 0.012; Rodriguez morán M et al showed a correlation between hypomagnesemia and development of neuropathy & foot ulcer in diabetic patients 19.

Diabetic Nephropathy & Hypomagnesemia

Out of 100, 14 patients had diabetic nephropathy; 13 of the 40 in the hypomagnesemia group had nephropathy (32.5%) and 1 out of the 60 in the normomagnesemia group had nephropathy (1.7%). The p value too supported this association p=0.001. Studies done by Pham PC et al 7 and Prakash DS Prabodh S et al 15 support this claim; in a study by Corsanello, the explanation for this association was provided for this association; i.e as there is albuminuria in diabetes mellitus, the 30% of the serum Mg which is protein bound might be lost more in diabetic nephropathy.

CONCLUSION

Low serum magnesium levels are commonly seen in diabetic patients. Hypomagnesemia patients had a higher incidence of retinopathy, nephropathy and neuropathy. A magnesium rich diet consisting of whole grains, legumes, fruits and vegetables such as spinach, okra, dry apricots may be recommended. Long term studies are needed to determine usefulness of magnesium supplementation in the management of type 2 diabetes

REFERENCES

1. Longo, Fanci, Kasper, Hanser, Jameson, Loscalzo, Harrison's principles of internal medicine 19th edition.
2. Pham PC, Pham PM, Pham SV, Miller JM, Pham PT. Hypomagnesemia in patients with type 2 diabetes. Clin J Am Soc Nephrol 2007;2:366-73.
3. Saris NEL, Mervaala E, Karppanen H, Khawaja JA, Lewenstam A: Magnesium: An update on physiological, clinical and analytical aspects. Clin Chem Acta 2000; 294: 1-26.