CORRELATION BETWEEN MAGNESIUM LEVELS AND HbA1C IN CONTROLLED & UNCONTROLLED TYPE 2 DIABETES MELLITUS

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ABSTRACT:

Diabetes mellitus is one of the most common metabolic disorder and leading cause of death and disability in the world. Type 2 diabetes is frequently associated with both extracellular and intracellular magnesium deficits. A chronic latent Mg deficit or an overt clinical hypomagnesemia is common in patients with type 2 diabetes, especially in those with poorly controlled glycemic profiles. Glycosylated Haemoglobin (HbA1c) levels correlate well with glycemic levels over the previous six to ten weeks. Measurement of glycosylated haemoglobin shows a promising approach to monitor diabetic patient and also provides a conceptual frame work for the pathogenesis of secondary sequelae of DM. To compare serum magnesium and HbA1C levels of type 2 diabetes mellitus patients with age matched controls.

Prospective comparative study undertaken at RVM Institute of Medical Sciences and Research Centre from August 2017 to July 2018. All the patients diagnosed to have type 2 diabetes mellitus were screened for the presence of complications. Based on screening, patients were divided into three groups: group I include normal healthy controls, group II includes controlled diabetic patients without complications and group III includes uncontrolled diabetic patients without complications matched by age and gender. All underwent fasting plasma glucose, postprandial plasma glucose, serum magnesium, spot urinary protein and HbA1c levels. Patients with other comorbidities like hypertension, chronic renal disease, pancreatitis, MI, epilepsy, pregnant and lactating women were excluded from the study. Serum Mg concentration $\leq$ 1.5 mg/dL was considered frankly hypomagnesemic and Mg concentrations $\leq$ 1.8 mg/dL was considered as preclinical hypomagnesemia. Total 210 patients were recruited for the study and 70 patients were included in each of the 3 groups. Among the patients 58.5 % were men, and 41.5% were women. The mean HbA1c was high in group III (11.67 $\pm$ 1.8%). The mean magnesium was low in group III (1.75 $\pm$ 0.26). 40 patients (5.9%) had overt proteinuria. There was a negative correlation between serum Mg and HbA1c levels ($r = -0.110$, $p = 0.004$).

The treatment of the patients of type 2 diabetes mellitus requires a multidisciplinary approach whereby every potential complicating factor must be closely monitored and treated. The study concludes hypomagnesemia and HbA1C levels are more in uncontrolled type 2 diabetes mellitus patients compared to controlled diabetic and non diabetic patients. If serum magnesium is low, increased dietary intake of magnesium should be recommended. Monitoring of HbA1C levels also helps in dealing with the complications.