Is the Glycaemic control in Type 1 Diabetes Mellitus affected by Vitamin D status?

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Background
Evidence from animal studies show that there is a relationship between plasma Vitamin D concentration and glucose homeostasis. Studies have also examined the relationship between Vitamin D status and Type 2 Diabetes Mellitus in adult population. There is paucity of evidence examining the relationship between the glycaemic control in children and adolescents with Type I diabetes Mellitus (T1DM) and Vitamin D status.

Objective
To evaluate the relationship between glycaemic status (HbA1C and plasma 25(OH) Vitamin D levels in children and adolescents with Type I Diabetes Mellitus.

Methods
Retrospective data was collected from 348 children and adolescents with T1DM. The serum 25(OH) Vitamin D concentrations were measured at diagnosis and as part of the annual assessment. Patients were categorized as: Vitamin D deficient (<25nmol/L), insufficient (25-50nmol/L) or sufficient (>50nmol/L). Vitamin D deficiency was treated with 6000 units of cholecalciferol once a day or 20000 units once a week for 6-8 weeks. All patients had their HbA1C measured every 3 months. Plasma 25(OH) Vitamin D was measured after the completion of treatment.

Results
The mean 25 (OH) Vitamin D concentration was 54 nmol/L (± 22.9). 52.4% of patients had normal Vitamin D concentrations (94% white ethnicity, 2% somali), 39.1% were vitamin D insufficient (87% white ethnicity, 4% somali) and 8.4% were vitamin D deficient (79% white ethnicity, 7% Arabic, 7% mixed background)(Table1). The mean HbA1C (mmol/mol) for the groups with adequate, insufficient and deficient Vitamin D concentration(nmol/l) were 72.36, 72.18 and 69.41 respectively. The mean HbA1C (mmol/mol) prior to treatment with vitamin D supplements was 70.85 (± 18.9) and post treatment was 69.85 (±15.95) [p=0.64].(Table 2). There was no significant correlation between Vitamin D concentration and HbA1C (r=0.05, p=0.2)

Conclusions
Low vitamin D concentrations are fairly prevalent in children with T1DM. Glycaemic control does not seem to be influenced by the vitamin D status in our retrospective study. Long term prospective studies are essential.