Vitamin D status in Egyptian children with newly-diagnosed type 1 diabetes and its relation to autoimmune destruction of pancreatic beta cells

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Background

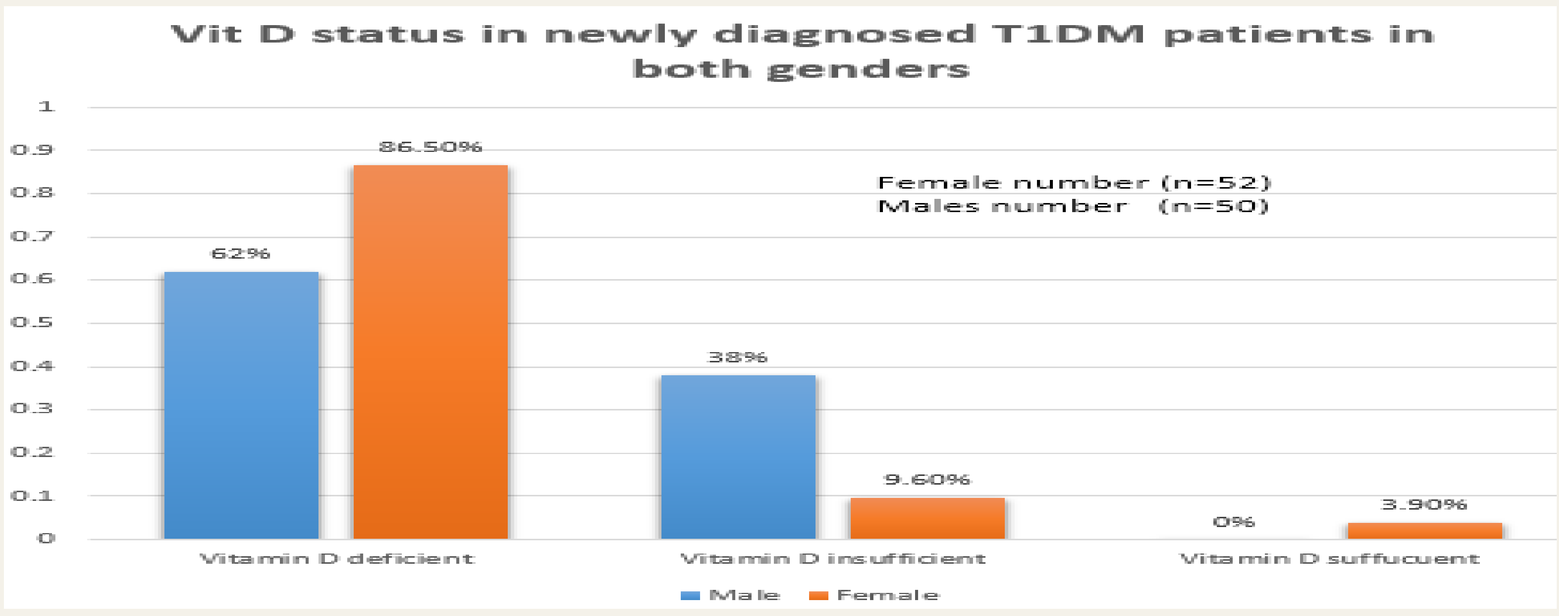
The relationship between 25 hydroxy cholecalciferol (25OHD) deficiency and autoimmune diseases including type I diabetes (T1D) is an ongoing area of research interest. Furthermore, vitamin D seems to affect β cells through calcium regulation, as insulin release is a calcium-dependent process. The aim of the study was to screen for 25OHD deficiency in children with clinical onset of T1D and study the correlation between its serum levels and anti-glutamic acid decarboxylase antibody titre, serum fasting and stimulated C-peptide levels which is considered as a marker of residual B cell function.

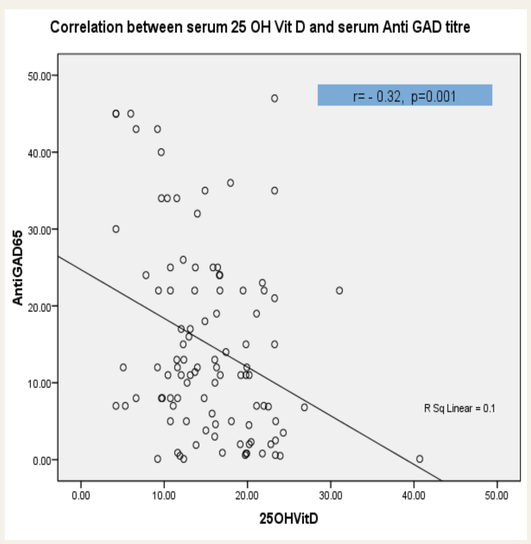
Subjects and Methods

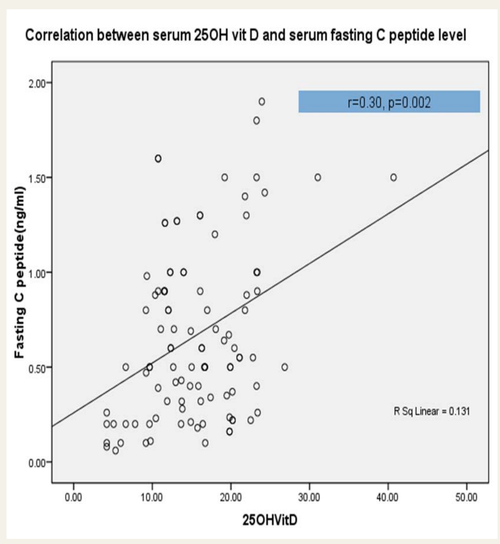
A cross-sectional study included 102 children with new-onset T1D. Serum levels of 25OH Vit D and anti-GAD 65 antibody were assessed at onset of diagnosis. Fasting and postprandial C-peptide were assessed 3 months later.

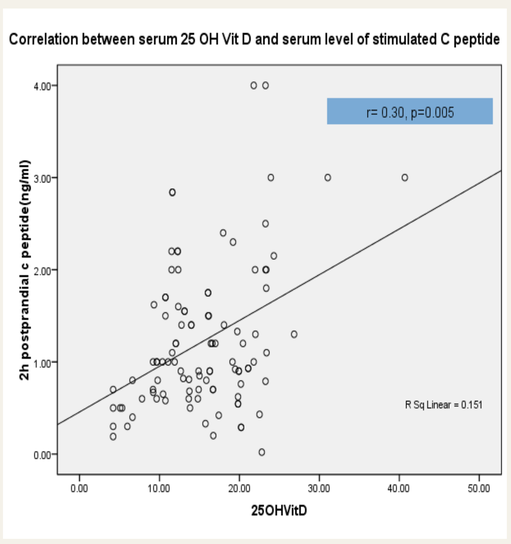
Results

Clinical characteristics	The study group (n=102)
Mean Age (ys)±SD	8.8±3.1
Female: male	52:50
Mean Weight (Kg) ±SD	32.01±15.25
Mean Height (cm) ±SD	130.34±19.67
Mean Diagnostic HbA1c levels (%)±SD	10.85±1.71
Mean 25(OH)D levels (ng/ml) ±SD	15.5±6.2
Median and range of Anti-GAD (u/ml)	15.1 (0.1-65)
Median and range of fasting C peptide (ng/ml)	0.5 (0.06-1.9)
Median and range of stimulated C peptide (ng/ml)	1 (0.02-4)









Logistic regression analysis of serum level of 25 OH Vit D and residual B cell function (Stimulated C peptide)

	Constant	B	P value	OR (95% CI)
Serum 25 OH Vit D	-0.062	0.098	0.04	1.1 (1-1.21)

Conclusion

Vitamin D deficiency and insufficiency was highly prevalent in Egyptian children with new-onset T1DM. In agreement with the hypothesis that an inadequate vitamin D trigger autoimmunity, vitamin D level in the studied cohort was negatively correlated with anti-GAD antibody levels, and was positively correlated with serum fasting and stimulated C-peptide. Furthermore, serum 25 OH vitamin D was a significant predictor of stimulated C-peptide which is believed to be the best marker for residual pancreatic function. Thus, it would be fundamental to study the effect of vitamin D supplementation in prediabetic state to slow the autoimmune cascade.

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