

Vitamin B12 Deficiency Prevalence among Type 2 Diabetes Mellitus Patients



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Introduction

Type 2 Diabetes Mellitus (T2DM) patients presenting with signs and symptoms of peripheral neuropathy as well as Vitamin B12 deficiency are supplemented with Vitamin B12 without serum B12 testing.

This study aimed to determine the prevalence of undiagnosed Vitamin B12 deficiency among T2DM patients in Manjung district and the associated risk factors.

Materials & Methods:

Study Design: Cross Sectional Study

Setting : Outpatient and Medical Outpatient Department (OPD & MOPD)
Hospital Seri Manjung (HSM)

Study Period : Jun 2016 till May 2017

Minimum sample size: 245

Inclusion criteria:

Type 2 DM Patients \geq 18 years old
Visit OPD / MOPD with or without treatment

Exclusion criteria:

1. Strict Vegetarians
2. Excessive alcohol consumption
3. Autoimmune disease - Grave's disease & SLE
4. Crohn's or Celiac disease
5. History of surgical removal of stomach/small intestine (short bowel syndrome)
6. Long term (1 year) use of Proton Pump Inhibitor
7. Patient on Vitamin B12 treatment within 3 months prior to participation
8. GDM Patients & Type I DM
9. Patients involved in other ongoing Clinical Trial

Data collection:

- Demography, T2DM and medications were recorded on a pre-tested data collection form.
- Diabetic neuropathy was screened using Michigan Neuropathy Screening Instrument (**MNSI**).
- Serum B12 level and full blood picture were tested.
- Vitamin B12 deficient patients (serum B12 level $<$ 156pmol/L) were treated and levels were repeated after 6 months.

Discussion

- The prevalence of Vitamin B12 deficiency among diabetic patients regardless of metformin use was much higher in other studies, than current study.
- This could be due to the different response among different ethnicity to Metformin use as well as the different dietary habits and lifestyles.
- We postulated that Vitamin B12 deficiency was not a problem among T2DM patients in Manjung district due to the choice of food with Vitamin B12 sources, probably among certain ethnic groups.
- Risk factors causing Vitamin B12 deficiency among T2DM could not be determined in current study as the prevalence was very low.

Results

We analysed 291 patients' data out of 301 recruited. Their median age was 56 years (IQR: 13). Majority were Malay (n=156, 53.6%), female (n=166, 57.0%), had median T2DM diagnosis for 5 years (IQR: 8).

Only 8 of them (2.7%) were antidiabetic drug naïve. A total of 260 subjects (89.3%) had current metformin use. The median HbA1c value was 8.1% (IQR: 2.7). The median MNSI score was 2.5 (IQR: 2.5).

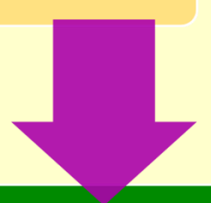
Main findings:

- **The prevalence of Vitamin B12 deficiency was 1.0%.**
- **Three (3) subjects had the deficiency.**
- **The risk factors of Vitamin B12 deficiency could not be determined.**

Characteristics of the 3 subjects with Vitamin B12 deficiency:

- male, Chinese, aged between 59-71 years
- diagnosed with T2DM for 7-12 years
- taking Tab. Metformin 1g bd for 0.9-7.0 years & sulphonylurea
- having HbA1c ranged between 7.1-10.8%
- positive of neuropathy
- having hypertension & dyslipidaemia

VITAMIN B12 DEFICIENT PATIENTS



Treated with oral mecobalamin 500mcg tds for 6 months,



B12 levels normalized (ranged between 176-218pmol/L).

Conclusion

- **The prevalence of undiagnosed Vitamin B12 deficiency among T2DM patients in Manjung district was low.**
- **The risk factors of Vitamin B12 deficiency could not be determined due to very low prevalence.**

Acknowledgement

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