*Endocrine Abstracts* (2019) **63** P222 | DOI: [10.1530/endoabs.63.P222](https://doi.org/10.1530/endoabs.63.P222)

Vitamin B12 deficiency prevalence and associated biomarkers in type 2 Diabetes (T2DM) treated with metformin: biochemical assessment in a series of 106 patients

Hernan Valdes-Socin, Laura Vranken, Lauranne Schoneveld, Pauline Delannoy, Caroline Le Goff, Albert Beckers & Etienne Cavalier

[Author affiliations](https://www.endocrine-abstracts.org/ea/0063/ea0063p222.htm#authorAffiliates)

**Introduction:** Increased B12 deficiency among T2DM patients using metformin has been reported. Holotranscobalamin (HoloTc), the bioactive form of B12, is proposed as a specific and sensitive marker of B12 deficiency. Methods to evaluate vitamin B12 deficiency in these patients remain controversial.

Methods: First, we studied the prevalence of vitamin B12 deficiency in a group of 106 T2DM patients treated by Metformin, not supplemented by B12. Antacids were taken by 29/106 patients. Second, we assessed associated biomarkers of vitamin B12 supply. All venous blood samples were analyzed for total VB12, HTc and Hcy on Abbott Architect. MMA was measured with a LCMS/MS method with the Chromsystems kit. Cut-off values defining VB12 deficiency were total VB12 < 200 ng/l, HoloTc < 35 pmol/l, Hcy > 15 μmol/l and MMA >300 nmol/l.

**Results:** Metformin dose ranged from 425 to 3400 mg/day (1 to 21 years). Mean age of the cohort was 60.9 years (range: 36–90). Patients under antacid presented lower B12, HTc, MMA and Hcy concentrations (*P*=0.007, *P*=0.0008, *P*<0.0001 and *P*<0.0001). A total of 18/106 patients (17%) were considered as deficient with total B12 assay but only 9/106 patients (8.5%) with HTc, 29/106 (27%) with Hcy and 21.6% with MMA. Four patients presented B12 <200 ng/l and HTc <35 pmol/l. The mean B12 values observed in patients with HTc <35 pmol/l was 208±83 pmol/l whereas the mean HTc in patients with B12<200 ng/l was 46.0±15.5 pmol/l. 33.3 vs. 55.5% of the patients with B12<200 and HTc <35 had HcY levels >15 μmol/l whereas they were 35% vs. 75% to have MMA>300 nmol/l, respectively (*P*=0.06). There was a significant correlation (*P*<0.0001) between B12 and HTC and HCy and between HTC and B12, MMA and HCY. For B12, multiple regression analysis using BMI, age, creatinine, folate, MMA, Hcy, antacid consumption and metformin intakes per day did not show any interrelated variable. Using Htc, as dependent variable and the same independent factors showed that creatinine (*P*<0.0001), MMA (*P*=0.0008) and Hcy (*P*=0.0010) were significantly associated.

**Conclusions:** The 2018 ADA Clinical Practice Recommendations endorse screening Metformin users for vitamin B12 deficiency. In our series, diabetic patients treated by metformin had B12 deficiency in 17% of cases (total B12) and only in 8.5% (HTC). HTC seems more specific than total B12 to assess vitamin B12 deficiency. Antacids seem to have an impact of vitamin B12 absorption