**An Audit of the Monitoring of Vitamin B12 Deficiency in Type 2 Diabetic Patients on Long Term Metformin**

**Introduction**

Metformin is a hypoglycaemic drug which is at the forefront in the management of type 2 diabetes (1). Despite its good side effect profile, there has been an increasing body of evidence concluding that long term metformin therapy is cause of B12 malabsorption and B12 deficiency (2, 3). Deficiency of B12 can result in a macrocytic anaemia, as well as protean neurological manifestations which include peripheral neuropathy, muscle weakness, ataxia and neuropsychiatric symptoms (4). It has been demonstrated that metformin induced B12 deficiency can become apparent after as little as 3 months of therapy, and that the chance and severity of deficiency increases over time (2, 5). Currently there are no published guidelines on the routine screening of patients on metformin for B12 deficiency, however with this evidence in mind, annual screening has been proposed by several authors (4).

**Aim**

This audit aims to compare the current practice of GPs at the Beeches Green Healthcare Centre regarding B12 monitoring in type 2 diabetics on metformin against recommendations of the body of evidence in this area. Through conducting this audit we hope to either confirm that the adequate standard is reached or to identify shortcomings and propose solutions for continued improvement of patient care.

**Target criteria**

The target criteria, as agreed with the partners, are that B12 levels should be checked on an annual basis for all patients with type 2 diabetes on long term metformin.

**Standard**

I would expect 100% of type 2 diabetics on long term metformin to have an annual B12 level.

**Method**

Data was collected using the practice software, EMIS. A search was conducted for all patients currently registered at the practice and taking metformin. This was automatically converted into a Microsoft Excel spread sheet. From within this patient search, information was taken from patient records to confirm their diagnosis of type 2 diabetes and of B12 levels taken over the dates 24th January 2012 and 24th January 2013.

**Results**

Patients with Type 2 diabetes taking metformin: 177

Patients having had a B12 level in the last year 8

**= 4% annual B12 monitoring**

**Discussion**

The results demonstrate that only 4% of type 2 diabetics on metformin have had their B12 levels checked in the last year. This falls short of the standard set at the outset of this audit.

There are several reasons for this discrepancy. As B12 levels are easily obtainable through a one off blood test, and the majority of patients with type 2 diabetes come in for regular review (often including blood tests such as fasting lipids, HbA1c etc), it is justifiable to say that a high standard should not be too difficult to achieve. Much more likely, the low levels of B12 screening are due to current practices within the surgery. Failure to check B12 level may well be due to lack of awareness of the issue, but may also be due to the lack of definitive guidelines on screening. It is possible that GPs may only be investigating B12 levels in symptomatic patients or in those with macrocytosis. While this may seem a more cost effective option, it has been demonstrated that peripheral neuropathy secondary to B12 deficiency often arises without evidence of megaloblastic anaemia on the blood film and that treatment for deficiency may only halt, and not reverse the damage caused (6) . This is compounded by diagnostic overshadowing, in that neuropathy may be assumed to be due to the diabetes as opposed to B12 deficiency.

**Recommendations for Change**

It is probable that poor monitoring of B12 levels is an issue of unawareness as opposed to one of organisation. Therefore, presenting this audit at the next practice meeting would be beneficial in raising awareness of the issue and implementing change. This could include proposals of ideal times to take B12 levels, for example incorporating the test into routine blood work for these patients. It may also be beneficial to provide a refresher on B12 deficiency, including the signs and symptoms to expect, the diagnostic pathway for excluding other causes of deficiency (e.g. pernicious anaemia) and the proposed management (Detailed below). Finally, in order to assess the impact of these measures, re-audit is indicated in one year’s time.

Figure 2. Protocol (from EMIS system) for investigation and management of B12 deficiency

References

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