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A re-audit of B12 and folate requests, November 2011

The College's Professional Standards Unit wishes to encourage high-quality clinical audit. We therefore periodically publish interesting examples of audits that have been successfully evaluated through our clinical audit certification scheme.

Introduction

B12 and folate assays are amongst the most frequently requested haematological investigations. A previous audit in 2010 showed that B12 and folate are commonly requested inappropriately based on the clinical details provided on the request form. A higher proportion of requests coming from primary care were inappropriate compared to requests from hospital clinicians. Less than 10% of requests had a low result and 16% represented a repeat request within a four-month period.

As a result of this audit, clinical guidelines have been written and are available to both general practitioners and hospital clinicians on the hospital intranet. In addition, all repeat requests within a set period are blocked by the laboratory and the following comment has been added onto the electronic 'Tquest' test requesting programme available to selected GPs: "Please assess the pre-test probability of tissue B12 or folate deficiency, i.e. is there anaemia or macrocytosis? vegan diet? GI problems or previous gastric surgery? neurological or psychiatric condition? If **none** of these are present, testing for B12 or folate levels is **unlikely** to be useful".

The current audit has been carried out to see whether there has been any change in requesting and to check that all repeat requests are being appropriately blocked.

Audit standards

The audit standards are taken from the previous audit in 2010, which are detailed below.

Vitamin B12 and folate levels are clinically appropriate in the following circumstances:

1. macrocytic, or otherwise unexplained, anaemia
2. macrocytosis without other explanation, e.g. drugs
3. specific neurological conditions, e.g. peripheral neuropathy, dementia (vitamin B12 assay **only** unless patient also has macrocytosis or anaemia)
4. severe oral ulceration
5. possible malabsorption syndromes, e.g. coeliac disease,

Testing for vitamin B12 or folate deficiency is **not** appropriate for other indications, e.g. tiredness, fatigue, anaemia clearly due to other causes, patients already on B12 or folate replacement therapy, etc.

Clinical details should be supplied on every laboratory request.

Table 1: Appropriateness of clinical requests

Appropriate n=24 (9%)		Dubious n=67 (27%)		Inappropriate n=159 (64%)	
Neuropsychiatric – neuropathy	1	Neuropsychiatric but B12 + folate requested	15	?Anaemia or anaemia with clear other cause	11
Neuropsychiatric – dementia/ memory loss	8	Non-specific neurological symptoms	10	Known low B12 on replacement	5
Anaemia ?cause	5	Acute psychosis/ confusion	3	No clinical details	32
Macrocytosis ?cause	9	No clinical details but high MCV, etc.	8	Falls	6
Malabsorption	1	Other *	31	Other**	105

* Other indications included coeliac with normal FBC, alcohol abuse and low neutrophils

** Other indications included fatigue, shortness of breath, hair loss, chronic renal failure, cardiomyopathy and back pain

Methods

All laboratory medicine request forms for vitamin B12 and/or folate levels received by the laboratory during November 2011 were collated. The source and written clinical details (where available) on the form were recorded. The results of analysed serum vitamin B12 and folate levels for each individual request were also collected from Telepath and a search for repeat requests on the same patient within the previous or subsequent three months was performed.

Results

A total of 807 requests for serum vitamin B12 and/or folate were received in laboratory medicine during November 2011 (median 809 requests per month in 2011, range 675–919).

Of these, 250 were analysed as detailed in the methods. 179 (72%) of these requests were made in primary care, with 71 (28%) coming from hospital clinicians. 72 of 179 (40%) of requests from primary care were electronic. 42 of 250 requests (17%) lacked any clinical details.

159 requests were deemed to be inappropriate from the clinical details provided. The associated full blood count result was reviewed for all of these requests. 76 of these (47%) had a normal full blood count, 41 (26%) had not had a full blood count done and 42 (27%) had an abnormal full blood count. Of the 42 which had an abnormal full blood count, almost half (20 of 42) were mildly anaemic with a normal MCV, two had a microcytic anaemia, three had a normal haemoglobin with low MCV, five normal haemoglobin with high MCV, five had a macrocytic anaemia and seven had a normal haemoglobin and MCV with a neutropenia.

Of the 179 requests from primary care, 72 (40%) were made electronically and 107 (60%) were paper requests. 16% (12) of electronic requests were appropriate whereas only 6% (6) of paper requests were appropriate (p=0.022, Fisher's exact test).

There were 153 requests for folate (three folate in isolation, 150 for both B12 and folate) and 247 requests for B12 (97 B12 in isolation and 150 for both).

Of the 153 requests for folate, 129 (84%) results were normal, 12 (8%) were low and three (2%) were high, eight (5%) were not tested as they were repeat requests and there was one insufficient sample.

Of the 247 requests for B12, 19 (8%) were repeat requests and therefore not tested, 4% (11) were low 7% (17) were high, 81% (199) were normal and there was one insufficient sample.

There were 45 (18% of the total of 250 requests) repeat requests, of these 28 were within a three-month period (11% of the total) and 17 were repeated 3–6 months from the previous request (7% of the total). Of the 28 repeat requests within a three-month period, 20 (71%) were not retested.

Table 2: Appropriateness of tests according to test source

	Hospital (n=71)	Primary care (n=179)
Appropriate	6 (8%)	18 (10%)
Dubious	17 (24%)	50 (28%)
Inappropriate	48 (68%)	111 (62%)

Discussion

This audit has shown that there has not been a significant change in the number of requests for B12 and folate since the previous audit in 2010 (median 903 per month in 2010, 810 per month in 2011). It confirms that, despite the implementation of written clinical guidelines, the majority of these tests are probably inappropriate based on the clinical details supplied. However, we know that clinical details are not always accurate and in fact are often missed altogether (17% of 250 requests) so this may not be a true representation of the number of inappropriate requests. Only ten (6%) of the requests deemed to be inappropriate based on the clinical details may have been wrongly classified. Five had a macrocytic anaemia and five had an unexplained macrocytosis, both of which would be an appropriate indication for B12 and folate testing.

The percentages of requests that were inappropriate (62% vs 68%) and those without clinical details (9% vs 8%) were approximately equally distributed between requests from primary and secondary care. There were several cases (5%) in which a B12 was indicated according to the clinical details given but both B12 and folate were requested, suggesting that clinicians do not always understand the separate indications for these tests.

It would appear that electronic requesting within primary care has led to a reduction in the rate of inappropriate tests (53% inappropriate electronic requests compared to 68% of paper requests, statistically significant by Fisher's exact test), so we would hope that when electronic requesting becomes universal, the overall number of inappropriate requests will reduce. This may be due to having an educational comment pop-up box when testing for B12 or folate is requested.

There continues to be a high rate of repeat requests (11% within a three-month period compared to 18% in the previous audit) although the majority of these samples are no longer being analysed as a result of the block on repeat requests within the laboratory.

Once again, there is a very small proportion of requests that actually produce a low result (7% for B12, 8% for folate) and it is still difficult to conclude how many of these represent a clinically significant deficiency.

The total cost (i.e. the amount charged for each request) for testing a sample is £5.63 for

B12 and £4.05 for folate. Reducing the number of inappropriate requests does have cost-saving implications, which could add up to a significant saving if laboratory tests are rationalised across the whole range of investigations provided by the laboratory (approximately £750 per month for B12 and folate alone).

Conclusions and recommendations

The majority of repeat requests (within 90 days for B12 and 30 days for folate) are blocked by the laboratory and this should continue.

A large proportion of requests continue to be inappropriate, but it would be impractical for the laboratory staff to screen requests prior to testing.

It would appear that electronic requesting may help to reduce the number of inappropriate requests; we are rolling out the Tquest system to more GPs and await the arrival of e-requesting within Salisbury District Hospital.

It is important to have clinical guidelines available. However, these are unlikely to have a significant impact on day-to-day test-requesting practice.

Action plan

Implementation of electronic requesting within Salisbury District Hospital, due June 2012.

Re-audit once electronic requesting is in use, likely early 2013.

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Reference

1. British Committee for Standards in Haematology. Investigation and diagnosis of cobalamin and folate deficiencies. *Clin Lab Haematol* 1994;64:101–115.
2. Smellie WSA, Wilson D, McNulty CMA *et al.* Best practice in primary care pathology: review 1. *J Clin Pathol* 2005;58:1016–1024.

Re-audit on verification of blood-borne viruses serology

Introduction

Errors in reporting of blood-borne viruses (BBV) serology and its interpretation have widespread implications. BBV including HIV serology interpretation helps clinicians in the management of patients including psychosocial aspects. Reporting errors cause mismanagement and have legal implications.

Errors can be minimised by checking previous samples performed on the same patient and interpreting the current result accordingly.

According to national guidelines,[1,2] BBV should always be confirmed by testing a second specimen. For example, if a patient sample is HIV antibody positive, a second sample is requested for further confirmation.

Following a 'Red Box' complaint (Ref No X0298/06) in October 2006, changes to the 'Duty Virologists Standard Operating Procedure (SOP) – verification of BBV serology results'[3] included the following - "Duty virologist should review the previous results of patient with positive result and add appropriate comments during verification."

This was first audited in July 2009 and this re-audit aims to assess compliance of duty virologists in meeting these reporting standards as recommended in the first audit report (2009). It was a successful audit submitted to the College's audit certification scheme in 2010.

Objectives

To monitor quality of BBV serology results verification by duty virologists.

To complete the audit cycle by re-auditing against July 2009.

Sample

All screening reactive HIV and HBV serology results over a one-month period between 1–30 October 2010 were included in the study to represent BBV serology.

Exclusions

All negative screening HIV and HBV serology results were excluded from the study.

Method

All HIV and HBV screening reactive results were extracted from the Meditech database between 1–30 October 2010. All previous HIV and HBV test