Patterns of Vitamin B12 Testing in Hospital

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Background

Vitamin B12 deficiency (B12D) can lead to neuropsychiatric symptoms and hematologic abnormalities, which mimic common disorders among inpatients. Body stores of vitamin B12 (mainly in the liver) can maintain adequate levels for ≥1.5 years even with no B12 intake. Physicians have been found to repeat tests in the community at intervals that are excessive according to practice guidelines.

Objectives

Characterize the ordering frequency and pattern of vitamin B12 testing, and its clinical utility in hospital. Assess appropriateness of repeat vitamin B12 measurements.

Methods

Inclusion Criteria
- Patients aged ≥19 years
- ≥2 vitamin B12 tests during admission(s) to St. Paul’s Hospital in 2018

Chart Review
- Risk Factors for B12D
- Reason for testing
- Serum B12 levels
- Total number of vitamin B12 tests
- Testing intervals

Results

Patient Characteristics

<table>
<thead>
<tr>
<th>Women</th>
<th>Men</th>
<th>Admissions</th>
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<tr>
<td>60</td>
<td>101</td>
<td>308</td>
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Testing Frequency

A) All Repeat Inpatient Tests (N=291)
- 2% of all inpatient tests
- 57% = 308
- 23% = 144
- 14% = 91
- 6% = 23

B) Repeat Inpatient Tests in ≤7 Days (N=77)
- 25% = 77
- 25% = 73
- 27% = 73
- 18% = 68
- 25% = 19

Discussion and Significance

Most inpatient vitamin B12 tests were repeated at inappropriately short intervals and 50 TO 83% of repeat inpatient tests were UNNECESSARY.

Systemic flaws (e.g. allowing duplicate tests) and cognitive biases (e.g. shotgun approaches) result in vitamin B12 test overutilization, which may INCREASE HEALTHCARE EXPENDITURE associated with test reagents, phlebotomy, and laboratory services.

Future Directions

- Educate health professionals (students, residents, physicians) on inpatient units and during rounds
- Establish a message alert on the clinical information system/electronic patient records to prevent unnecessary testing or duplicate orders
- Examine other commonly ordered inpatient tests to assess for appropriateness (e.g. HbA1c)

References