Clinical Manifestation of Vitamin B12 Toxicity

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Background

In the United States, nearly 20% of people over the age of 60 have B12 deficiency. There is extensive literature on the sources and functions of Vitamin B12 and the clinical characteristics of Vitamin B12 deficiency (Figures 1-3), but limited research on elevated B12 levels and its effect on the body. Hypercobalaminemia is often misunderstood and considered irrelevant because of the unlikelyhood of adverse health effects and its low potential for toxicity.1,3

Purpose

The purpose of this case is to highlight the continuity of care between a chiropractor and primary care physician working within the same healthcare system through cooperative case involvement. This is a unique case in which peripheral neuropathy and muscle twitches present as the clinical manifestations of B12 toxicity and chiropractic education was used as treatment.

Case Description

- 49-year-old female
- Bilateral numbness, tingling, and muscle spasms in arms, legs, and upper back
- MRIs and EMGs negative
- Laboratory findings normal except elevated B12

Timeline and Outcomes

<table>
<thead>
<tr>
<th>Year</th>
<th>Symptoms and Outcomes</th>
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<tbody>
<tr>
<td>Fall 2022</td>
<td>Numbness, tingling, and muscle spasms begin</td>
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<tr>
<td>Winter 2022</td>
<td>B12 secure level &gt;2,000 pg/mL</td>
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<tr>
<td>Spring 2023</td>
<td>Initial chiropractic visit</td>
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<tr>
<td>Summer 2023</td>
<td>Initial chiropractic visit, patient states she had “very few issues in the last 4 weeks.”</td>
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Discussion/Conclusion

Mechanism

Once ingested, Vitamin B12 dissociates from its carrier protein, binds with intrinsic factor in the stomach, and is absorbed in the ileum of the small intestine. The transport of cobalamin to all tissues of the body requires transcobalamin (TCB) proteins. The majority of high serum cobalamin typically involves a disorder of TCBs.

- Evidence of symptoms of B12 toxicity:
  - Palpitations
  - Headache
  - Insomnia
  - Anxiety
  - Akathisia
  - Acne
- No upper intake level B12:
  - Daily supplement of 520 mcg B12 (216% over RDA)
  - Diet high in fatty fish
- Case supports:
  - B12 toxicity correlated with widespread paresthesia and muscle spasticity
  - Importance of continuity of care

Limitations

This is not a controlled study and there are many variables that may have influenced this case. The outcomes reported in this case may have been consequent to natural history of the patient’s pathology. The outcomes may also be a result of a combination of several modalities used during chiropractic management that synergistically worked together to improve symptoms. There is no current definition of B12 toxicity and there is limited evidence on the explanation of the physiological response to elevated B12 levels, therefore further research is needed as specific conclusions cannot be drawn from a single case.

References