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Rare sensory paresthesia due to low dose vitamin B6 supplementation

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Abstract

The dose dependent relationship between elevated vitamin B6 levels and neurotoxicity has not been well established. Sensory neuropathy commonly develops at doses over 1000 mg/day supplementation, but rarely at doses in the range of 500-200 mg/day. This report describes a 78 year old female who presented to the clinic with severe sensory paresthesia in her face, trunk and bilateral lower extremities. These symptoms began four months prior and progressed slowly in a stocking-glove fashion from the extremities to the trunk. Upon further evaluation, she was taking vitamin B6 supplements at doses of 100 mg/day for the last couple of years. This is well below the accepted toxicity threshold. Her vitamin B6 was elevated at 30.5 ng/ml (reference 2.7-21.7 ng/ml) and was likely the explanation of her symptoms as the rest of her workup was negative for other etiologies. We recommended she discontinue the supplements and her symptoms completely resolved six weeks later. At this time her new vitamin B6 blood level was normal at 12.3 ng/ml (reference 2.7 – 21.7 ng/ml). This report demonstrates sensory paresthesia may develop even at lower doses of vitamin B6 supplementation.

Keywords

Vitamin B6 toxicity; Pyridoxine toxicity; Vitamin B6 deficiency; Pyridoxine deficiency.

Abbreviations

NCS: Nerve conduction study; EMG: Electromyography.

Introduction

It is well established that elevated levels of vitamin B6 in the blood can lead to several adverse effects, most commonly sensory neuropathy. The NIH recommends normal healthy adults consume between 1.3-2.0 mg/day of vitamin B6 to achieve optimal therapeutic effects depending on age, sex, and pregnancy status. The best source to obtain adequate vitamin B6 is through eating a well-balanced diet. It is abundant in fruits, vegetables, whole grains, lean meats, and nut products [1]. Diet alone will not result in vitamin B6 toxicities. There is not a high enough concentration in foods to exceed the upper limit of 100 mg/day and produce symptoms of toxicity. Therefore, nearly all cases of toxicity result from supplementation or are iatrogenic [2]. Many patients take self-prescribed vitamins to improve and maintain their health. Patients have a greater chance of developing adverse effects from supplementation at higher doses and for longer periods of time [3]. However, the dose dependent association between elevated B6 levels and toxicity has not been established [4]. There are a few case reports demonstrating patients with sensory neuropathy taking 500 mg/day, but rare reports of this side effect with 200 mg/day or less.2 This case report investigates a healthy 78 year old female taking B6 supplements of 100 mg/day for a couple years, which is well below the accepted toxicity threshold. She developed severe sensory paresthesia that resolved six weeks after discontinuing the supplement.

Case presentation

A 78-year-old female presented to our clinic complaining of a stinging sensation in her face, trunk, and bilateral lower extremities. The stinging began four months ago and was concentrated mostly in her feet. It appeared exclusively at night and resolved on its own by morning. As the weeks continued, the pain progressed symmetrically and proximally over the lower extremities and was now constant. She sought medical attention with an outside provider who prescribed gabapentin 100 mg TID and performed lab workup for sensory paresthesia, including a NCS/EMG. The results of this workup showing normal CBC, CMP, lyme titers, and TSH. Abnormal results were elevated B6 at 30.5 ng/ml (reference 2.7-21.7 ng/ml), elevated B12 at 1243 pg/ml (reference 180-914 pg/ml), elevated ESR at 35 mm/hr (reference 0-30 mm/hr), elevated HbA1c at 6.0% (reference 4.3-5.6%), and reduced creatinine at 0.55 mg/dl (reference 0.6-1.2 mg/dl). The EMG only showed mild bilateral carpal tunnel syndrome. Her past medical history is significant for breast cancer, GERD, depression, and B12 deficiency. She has a history of degenerative arthritis in her neck. Her current medications include: aspirin 81 mg once daily, citalopram 20 mg once daily, gabapentin 100 mg TID, efinaconazole 10% topical solution, and olopatadine 0.7% eye drops. She also takes supplements, including calcium carbonate 600 once daily, B12 750 mcg once daily, B6 100 mg once daily, and centrum silver pro multivitamin once daily. She eats a well-balanced diet with fish once per week and hummus with chick peas a few times per week. The physical exam was normal. Based on her B6 supplementation, multivitamin use and fish consumption, we estimate her daily intake of total B6 was no greater than 110 mg/day. We recommended to stop the B6 supplementation and pursue further NCS/EMG testing. Due to COVID-19 pandemic, the test was delayed six weeks per CDC guidelines. At this visit she reported that she was free of all the symptoms previously stated. Her new B6 levels were reduced to 12.3 ng/ml (reference 2.1-21.7 ng/ml). The results of NCS/EMG were negative.

Discussion/conclusion

B6 is commonly taken as an over the counter self-prescribed supplement. The majority of patients will not experience adverse effects of B6 supplementation. The symptoms include from photosensitivity, gastrointestinal upset, dermatologic skin eruptions, movement disorders, but the most common is sensory neuropathy. There are clear signs of both peripheral and central nervous system toxicity at very high doses of 2000 mg/day [5]. The lower dose toxicity is not established but mostly affects the peripheral nervous system. Sensory peripheral neuropathy develops when the daily intake exceeds 1000 mg/day [6]. In this case, it is rare for a patient with such low B6 supplementation to experience severe sensory paresthesia. Her total estimated daily intake of B6 was found to be no more than 110 mg/day. It was calculated based on the following: (1) one tablet of 100 mg B6; (2) one tablet of centrum pro multivitamin containing 3 mg of B6; (3) the average diet of healthy adult women consumes 1.5 mg/day of vitamin B6. Because this patient eats fish a few times a week, an absolute maximum of 7 mg consumed from the diet was estimated. She does not take more than one pill of her supplement or multivitamin each day. Malingering and other mental health issues such as overdose were ruled out from her history and physical exam. She does not take other medications that would increase the concentration in the blood and her renal function is intact. The fact that her symptoms resolved after only discontinuing B6 supplementation strongly favor a diagnosis of sensory neuropathy due to B6 toxicity.

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