

## Case Report: Recurrent aphthous stomatitis responds to vitamin B<sub>12</sub> treatment

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**R**ecurrent aphthous stomatitis (RAS) is one of the most common lesions of the oral mucosa seen in primary care. Aphthous ulcers affect up to 25% of the general population, and 3-month recurrence rates are as high as 50%.<sup>1</sup>

Minor aphthous lesions are the most common presentation. They appear as small, round, clearly defined, painful ulcers that heal in 10 to 14 days without scarring. They often recur. Major RAS lesions are larger (>5 mm), can last for 6 weeks or longer, and frequently leave scars. The third type of RAS, herpetiform ulcers, present as many small clusters of pinpoint lesions that sometimes coalesce to form large irregular ulcers. They last for 7 to 10 days.

Factors that predispose patients to RAS include infections, trauma, dryness, irritants, toxic agents, genetic factors, hypersensitivity, and autoimmune conditions. Systemic diseases, such as HIV, Crohn disease, Behçet syndrome, Reiter syndrome, and gluten-sensitive enteropathy, can appear as aphthous stomatitis. Recurrent aphthous stomatitis can also result from a nutritional deficiency, particularly lack of iron, vitamin B<sub>3</sub> (as in pellagra), vitamin C (as in scurvy), folic acid, or vitamin B<sub>12</sub>.<sup>2,4,5</sup>

A change in local regulation of the cell-mediated immune system after activation and accumulation

of cytotoxic T cells might contribute to the localized breakdown of mucosa. Treatment with topical steroids and local anesthetics, as well as systemic steroids, can help in severe acute conditions.

We describe three young, otherwise healthy, patients who had RAS for several years. All three were found to suffer from a vitamin B<sub>12</sub> deficiency. Replacement therapy with vitamin B<sub>12</sub> led to complete recovery.

### Case 1

A 30-year-old woman, married with four children, had been coming to our clinic once a month for about 4 years complaining of RAS. Results of a general physical examination were normal. Laboratory tests revealed normocytic anemia (hemoglobin 116 g/L, mean corpuscular volume 84 fL). Topical corticosteroids and local anesthetics improved the ulcers for short periods. A year ago, she began complaining of generalized weakness, fatigue, mood changes, and paresthesias of her extremities.

Neurologic examination revealed decreased tendon reflexes and lowered distal touch and vibration sensations. Results of further investigation, including thyroid, liver, and kidney function tests and testing for folic acid levels, were normal. Her serum vitamin B<sub>12</sub> level was 65.1 pmol/L; normal levels are 115.8 to 781.3 pmol/L. Further investigation for malabsorption of vitamin B<sub>12</sub>, including testing for parietal cell antibodies, found no abnormalities.

Evaluation of the patient's diet revealed very low intake of meat and other animal products. Replacement therapy was started with 1000 µg of parenteral vitamin B<sub>12</sub> twice a week for 6 weeks and continued with injections once a month for a year.<sup>3</sup> We expected to see improvement in symptoms related to vitamin B<sub>12</sub> deficiency, but we also

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noticed a rapid and complete recovery from RAS. During 6 months' follow up, the aphthous ulcers did not reappear.

## Case 2

A 19-year-old woman had suffered from a mood disorder, memory disturbances, and paresthesia of her extremities for about 1 year. She also complained of recurrent oral ulcers and was under investigation for suspected Behçet syndrome. Neurologic examination disclosed mild sensory polyneuropathy. Laboratory tests revealed macrocytic anemia (hemoglobin 105 g/L, mean corpuscular volume 104 fL). Her thyroid-stimulating hormone, folic acid, and iron levels were normal, but her vitamin B<sub>12</sub> level was low (64.2 pmol/L). She tested positive for parietal cell antibodies.

Urgent treatment with parenteral vitamin B<sub>12</sub> (dosage as in case 1) improved her general neuropsychologic status, corrected her chemical abnormalities, and got rid of her oral ulcers. Long-term follow up and continued treatment with vitamin B<sub>12</sub> led to complete recovery. The suspected Behçet syndrome was ruled out.

## Case 3

A healthy 28-year-old man had suffered from RAS for 3 years. Treatment of symptoms improved his condition for short periods. Results of laboratory tests were normal. Further hematologic investigation showed normal folic acid and iron levels, but a vitamin B<sub>12</sub> level in the lower limits of the normal range (125.4 pmol/L). He ate meat only once every 2 weeks.<sup>3</sup>

Treatment with parenteral vitamin B<sub>12</sub> (dosage as in case 1) led to rapid improvement. Six months' follow up revealed complete recovery without recurrence of RAS.

## Discussion

Deficiency of vitamin B<sub>12</sub> is frequently associated with glossitis and atrophic gastritis but not generally thought to induce RAS.<sup>2,4-7</sup> The precise role

### EDITOR'S KEY POINT

- When patients have recurrent aphthous ulcers, consider checking vitamin B<sub>12</sub> levels and treating patients if levels are low. Such treatment could reduce some varieties of recurrent aphthous ulcers.


### POINT DE REPÈRE DU RÉDACTEUR

- En présence d'ulcères aphteux récidivants, penser à vérifier les niveaux de vitamine B<sub>12</sub> et si ces niveaux sont bas, instaurer un traitement. Le traitement pourrait atténuer certaines formes d'ulcères aphteux récurrents.

of vitamin B<sub>12</sub> deficiency in pathogenesis of RAS is unclear, although suppression of cell-mediated immunity and changes in the cells of the tongue and buccal mucosa have been reported.

In searching for the cause of RAS in our three patients, we found low levels of serum vitamin B<sub>12</sub>. Vitamin B<sub>12</sub> administered according to the protocol described in case 1<sup>3</sup> led to rapid improvement and complete recovery within several weeks. Six months' follow up of all three patients revealed no recurrence of RAS.

## Conclusion

We are far from knowing the exact etiology of RAS. We suggest determining patients' vitamin B<sub>12</sub> levels, as replacement therapy with this vitamin could be of considerable benefit to them. 

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