



## Low Serum Ferritin and Recurrent Aphthous Stomatitis in Young Females; A Case Series

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### Abstract

Recurrent aphthous stomatitis is considered the most common type of recurrent oral ulcers that affects adversely the quality of life of patients. Its etiology is not well understood, however, nutritional and psychosocial factors have been suggested in a certain category of patients. The aim of this case series is to describe the hematological picture namely hemoglobin level, serum vitamin B<sub>12</sub> and serum ferritin in six young female patients affected by recurrent aphthous stomatitis, and to report its association of low serum ferritin.

**Keywords:** Recurrent Aphthous Stomatitis (RAS); Ferritin

### Introduction

Recurrent aphthous stomatitis (RAS) is considered the most common type of recurrent oral ulcers. These ulcers present in three forms according to their clinical picture; the minor, major and herpetiform ulcers. The most common form of these is the minor type which affects more than 85 % of RAS patients [1]. Clinically minor ulcers appear as shallow ulcers with a yellowish-whitish floor and a well-defined red halo that is regular in shape [2]. Occurrence and recurrence of RAS will eventually affect the quality of life of patients due to the associated oral soreness and burning sensation jeopardizing oral functions like speaking, and mastication.

Approximately 20% of the general population is affected by RAS, but incidence varies from 5% to 50% according to ethnicity and socioeconomic status [3].

Although etiology of RAS is not well-determined yet, nutritional and psychosocial factors have been suggested in a certain category of patients [4]. A small percentage of RAS patients (5-10%) show low serum levels of iron, folate, zinc, or vitamins B1, B2, B6 and B12 indicating that nutritional deficiency is apparently an etiological factor for RAS [4,5].

This case series aims to report the laboratory findings namely hemoglobin level, serum vitamin B<sub>12</sub> and serum ferritin in seven RAS patients who attended the oral medicine clinic at Taibah University Dental Hospital (TUDH) for treatment of their oral ulcers. It also aims to report the low serum ferritin level that was observed in these patients.

### Findings

Patients attended the oral medicine clinic complaining of recurrent oral ulcers. All patients reported no medical illness except for the oral ulcers. They had minor ulcers that appeared exclusively in the labial and/or buccal mucosa (Figure 1 and 2). History and clinical features were suggestive of RAS. Topical treatment based on hyaluronic acid was prescribed to patients and they were referred to the same laboratory to perform the following tests: complete blood count, serum ferritin and serum vitamin B<sub>12</sub>. Patients' age range was 13-34 years (mean=20.4, SD=6.9). Only one patient was anemic (hemoglobin (Hb) = 9.2 g/dl), while the rest of patients had a normal Hb level (mean=13, SD=1.74). Serum ferritin level ranged from 6-50.8 ng/ml (mean=26.1, SD=15.2), and serum vitamin B<sub>12</sub> ranged from 164-764 pg/ml (mean=461.4, SD=226.7). Patients who had low serum ferritin were prescribed iron supplements, and they showed marked improvement in symptoms following therapy.

### Discussion

During the year 2015, the oral medicine clinic received approximately 90 new patients who had various oral diseases ranging from local oral disease to oral manifestations of systemic disease. There was seven RAS patients among them; six out of these were young females with low serum ferritin level.

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**Figure 1:** Minor aphthous ulcer (arrow) affecting the labial mucosa of a non-anemic 22-year old woman with a serum ferritin level of 11.9 ng/ml.



**Figure 2:** Minor aphthous ulcers affecting the labial mucosa in a 13-year old girl.

There are a number of factors that need to be approached when addressing RAS in young female patients, namely; serum ferritin levels, anemia, and stress initiated by school life. Iron deficiency is the most common nutritional deficiency [6], and women have a higher predisposition to developing iron deficiency [6], and to becoming anemic [7]. Possible causes for iron deficiency in our patients may include reduced intake and/or increased loss through menstruation. In women, appearance of RAS may coincide with menses, and studying-related stress may further explain the higher prevalence of RAS in students [8,9].

Anemia in women is defined by the World Health Organization as an Hb level that is below 12.0 g/dl [10], hence only one of the patients had anemia (Hb level < 12.0 g/dl). Iron deficiency, on the other hand, is best evaluated by measuring serum ferritin levels [11]. This may explain why RAS is more prevalent among women.

Taking into consideration the fact that ferritin is an acute phase protein that can be elevated in a variety of inflammatory and infectious conditions, individuals may still have normal ferritin levels in spite of being iron deficient (false negatives) [6].

Iron is critical for the growth and differentiation of all cells, and its deficiency may lead to epithelial abnormality or atrophy [12,13]. Many studies have reported a highly significant reduction in the total epithelial thickness, particularly the thickness of the maturation compartment [14].

Iron deficiency without overt anemia can result in neuropsychological effects and has been linked to delayed cognitive

development in children and adolescents [15]. Interestingly, the diagnosis of nutritional deficiency and anemia from oral mucosa changes can be established in the absence of symptomatic anemia or even in the pre-anemic stage [16].

Patients who are not anemic but have serum ferritin levels of less than 15-30 ng/ml are diagnosed as having tissue iron deficiency [17]. Six out of seven of our patients had serum ferritin levels of  $\leq$  30 ng/ml indicating tissue iron deficiency. It had been suggested that hematologic screening of RAS patients for anemia or deficiency of iron, folate, and B vitamins is appropriate for patients with major RAS or cases of minor RAS that worsen during adult life [1]. According to the findings of this case series, another category of RAS patients that require hematologic screening may also include young females.

## Recommendations

Routine hematological screening for serum ferritin, folic acid and vitamin B<sub>12</sub> should be assessed in all patients with RAS to treat any nutritional deficiency and to prevent more important related systemic manifestations [18].

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