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**ATROPHIC GLOSSITIS AS A CLINICAL SIGN FOR ANEMIA IN THE ELDERLY**

(Case report)

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**ABSTRACT**

**Background:** Atrophic glossitis is caused by nutritional deficiencies and this condition commonly affects elderly patients. It may be the first sign of more serious systemic diseases or condition like anemia. **Aim:** Describe about the atrophic glossitis in an elderly woman as a first clinical sign of anemia and the treatment. **Case:** The patient was a 74-year-old woman with complaints of pain, burning sensation and numb of the tongue for the last 3 months. The patient has gone to the general dentist and given some medicines but the complaint still persists. **Case management:** Extra oral examination showed the conjunctiva was anemic, and from intraoral examination found depapillated and glossy tongue. Then the laboratory tests showed haemoglobin, haematocrite and the number of erythrocytes were decreased, while MCV and MCH level were increased. The patient's tongue abnormalities were diagnosed as atrophic glossitis associated with anemia Vitamin B (B12 dan folate) deficiencies. Patients were given high dose of folic acids and vitamin B12 per oral, and mouthwash containing hyaluronic acid as anti inflammation alternating with chlorhexidine gluconate 0,2% mouthwash as an antiseptic. The tongue was repaired after 1 month therapy and healed in 2 months. **Discussion:** Atrophic glossitis is considered as one of the the clinical signs of anemia, that appears as areas of complete or irregular partial loss of papillae of the tongue, which is caused by atrophy of the lingual papillae. The analysis of the appropriate diagnose and causative factors can be assisted through a complete blood examination and will help us to decide the appropriate therapy. **Conclusion:** Dentists must be aware of the clinical signs of atrophic glossitis, because it can be an indication of a major health problem especially anemia.

**Keywords:** Anemia macrocytic, atrophic Glossitis, elderly

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## INTRODUCTION

Anemia is a major public health problem, affecting around a quarter of the world's population, especially among women in developing countries. Anemia is the main haematological consequence of nutritional deficiency.<sup>1,2</sup> Anemia in the elderly (defined as people more than 60 years old) is common and increases with population growth, and has a significant effect on quality of life, including physical health, psychological health, social relations and relationships with the environment. In the elderly the most common cause of anemia is deficiency of vitamin B12 and folic acid.<sup>3,4,5</sup>

The oral mucosa reflects general health status. Some changes in the tongue may be a manifestation of systemic diseases, nutritional deficiencies and early signs of severe disease. Atrophic glossitis is an inflammatory disorder, which gives the appearance of a smooth dorsum tongue with a reddish color, accompanied by pain and burning sensation. Atrophic glossitis, occurs when the loss of 50% of the fungiform and filiform papillae on the dorsum of the tongue. In general, Atrophic glossitis is caused by nutritional deficiencies associated with deficiency of vitamin B12, iron, folic acid, riboflavin, and niacin. Atrophic glossitis is considered as a sign of nutritional deficiency anemia.<sup>6,7,8</sup>

The aim of this case report was to explain about Atrophic Glossitis in a woman, elderly patients as a clinical sign of anemia and will describe its management.

### Case Report

A 74-year-old woman came to Oral Medicine Installation at our Dental Hospital with complaints of pain, burning sensation and numb of her oral mucosa, especially on the tongue. This has caused difficulty in eating and swallowing also unable to feel the taste of foods. Complaints were felt for the last 3 months. Patients has gone to the general dentist and were given topical steroid gel

treatment as anti-inflammatory, but the complaints still persists. Patients had a history of gastrointestinal disease and routinely went to the internal medicine doctor every month. She also had

received antacid DOEN and Lanzoprazole treatment routinely.

On extra oral examination found anemic conjunctival eyes, and dry lips. Intra oral examination showed paleness of the oral mucosa and gingival, depapillation in the dorsal tongue and fissure tongue (figure 1). We found grade 2 mobility in teeth 31, 32, 33, 41, 42, 47, and 48 also tooth missing 36.



Figure 1. *Atrophic glossitis*, the clinical feature of the tongue was depapillated and glossy

(Visit I)

Based on the history taking and clinical examination, the diagnosis of the patient was suspected to Atrophic glossitis with anemia as predisposing factors. The differential diagnosis were burning mouth syndrome or oral manifestations of Diabetes Mellitus, because of dry lip and periodontitis that also found. Initial managements were given a non-steroidal anti-inflammatory mouthwash containing Hyaluronid acid and aloe vera, instructions to maintaining cleanliness and oral health, to eat balanced nutrition, drink milk and adequate hydration, get enough rest and light exercise. Patients were also asked to do a routine 8-parameter of complete blood count (Haemoglobin, leukocyte count, platelet count, hematocrit, erythrocyte count, MCV, MCH, and MCHC), fasting blood sugar and 2-hours post pandrial blood sugar.

At the second visit (1 week later), the patient came with burning sensation and pain of the tongue were felt by patients to be slightly reduced. The mouthwash was used regularly, but the clinical condition of the tongue had not shown significant improvement (figure 2). The results of a laboratory

examination showing 9.8 g/dl Hb (normal: 12.0-16.0 g / dl), 29% hematocrit (normal: 37%-47%) and the erythrocytes count 2.56 million/mm<sup>3</sup> (Normal: 4.2-5.4 million/mm<sup>3</sup>), MCV 112.5fl (Normal: 86-98 fl), MCH 38,3pg (Normal: 27-32 pg), MCHC 34.0% (Normal: 32%-36%), fasting blood sugar 82 mg/dl (Normal: 82-115mg/dl) and 2 hours pp blood sugar 96 mg/dl (normal <120 mg/dl). It can be concluded that Hb levels, hematocrit and the number of erythrocytes decreased while the MCV and MCH values increased, but the MCHC, fasting blood sugar and 2-hours PP blood sugar were still within normal limits.



Figure 2. *Atrophic glossitis*, the clinical condition of the tongue had not shown significant improvement (Second Visit)

Based on the laboratory test results of clinical diagnoses were supporting Atrophic glossitis related to vitamin B deficiency anemia, and the differential diagnosis were excluded. Further management in patients were still given non-steroidal anti-inflammatory mouthwash containing Hyaluronic acid and aloe vera, added with administration of 2x50mcg/day of Vitamin B12, and multivitamins containing Vit C, Vit E, Vit B1, Vit B2, Vit B6, Vit B12, Folic Acid and Zinc.

On the third visit (1 week later), complaints of burning sensation and pain of the tongue still existed, but patients were more able to feel the taste of food. Patients complained of abdominal pain after taking a multivitamin given beforehand so that the drug was not taken anymore, but mouthwash and vitamin B12 were used as recommended. On intra-oral examination it was found that the dorsum of the tongue still had depapillation, accompanied by

macular erythema with diffuse margin on the upper and lower labial mucosa and both of buccal mucosa (figure 3).



Figure 3. a. *Atrophic glossitis* the dorsum of the tongue still had depapillation and there were not significant improvement yet, b-e. erythematous macular with diffuse margin on the upper and lower labial mucosa and both of buccal mucosa (Third Visit)

The therapy given was replacement of the previous mouthwash with 0.2% Chlorhexidine gluconate mouthwash as antiseptic used 3x10ml/day. The oral administration of folic acid 1x1000mcg/day and 2x50 mg vitamin B12 per day were also given.

At the fourth visit (the following 1 week), the complaints of burning sensation diminished and the numbness in the tongue showed a slight good improvement. The appetite of the patient was said to be getting better, and the weight increase occurred to 37.4 kg (previously 37 kg), but the patient also complained of canker sores on the upper lip mucosa.

On intra-oral examination found, depapillation of the dorsum of the tongue appears to be repaired slightly, erythematous macular lesions on both buccal mucosa, upper and lower labial mucosa was not found, but in the upper labial mucosa were found multiple ulcers with a yellowish base surrounded by erythematous and irregular edges, the diameter of ulcers size between 1mm-3mm (figure 4). Then oral therapy was given vitamin B12 in the same doses as before, but the folic acid doses was increased to 1x5000 mcg/day.

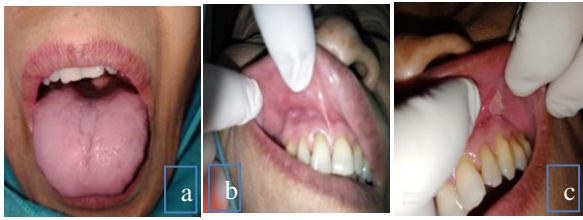


Figure 4a. *Atrophic glossitis* showed slightly good improvement. b-c. multiple ulcers with a yellowish base surrounded by erythematous and irregular edges at upper labial mucosa(Forth Visit)

On the fifth visit, complaints on the tongue have diminished and are getting better day by day so that it increased the appetite. The intra oral examination were not found the multiple ulcers anymore and the atrophic glossitis lesions getting better (figure 5). The patient's body weight also increased slightly to 37.5 kg. Subsequently the patient was consulted for the management of chronic periodontitis with grade 2 mobility in several anterior mandibular teeth. The therapy given was still the same as the previous visit. Patients were asked to control the following 2 weeks.



Figure 5. *Atrophic glossitis* showed better improvement and multiple ulcers had healed (Fifth Visit)

Sixth visit, complaints on the tongue have improved so that the patient's appetite also gets better. Provision of therapy was continued in the form of vitamin B12 2x50 mcg/day and folic acid 1x5000 mcg/day. The patient was asked to do again for 8 parameter complete blood count test and control is recommended again after treatment in the periodontia department.

At the last visit (after 1 month), complaints in the oral cavity and tongue were no longer felt, appetite improved and the patient's weight became 37.9 kg. The results of laboratory tests showed improvement too, even though it had not reached the normal reference value yet, namely Hb 10.3g/dl,

hematocrit 32%, and erythrocytes count 3.06 million/mm<sup>3</sup>, MCV 106.2 fl, and MCH 33.7 pg. Thus the Hb value, hematocrit and the number of erythrocytes have increased from the previous examination approaching the normal reference value, and the MCV and MCH have decreased from the previous approach to the normal value of the reference value.

The clinical feature of the tongue has shown a normal tongue papilla since previous visit (figure 6a), but in this visit accompanied by a slight plaque on the patient's dorsum of the tongue (figure 6b). Patients were asked to continue per oral treatment of vitamin B12 2x50 mcg/day and folic acid 1x5000mcg/day, keep maintain tongue hygiene and continue periodontal treatment until completion.



Figure 6a. Dorsum of the tongue showed normal papillation (Sixth Visit). b. Dorsum of the tongue at seventh visit with slightly plaque

## Discussion

In this case, Atrophic Glossitis occurs in elderly patients and is associated with anemia. This anemia can occur due to lack of nutritional intake. In the elderly, a decrease in nutritional intake and appetite can be caused by various factors, including reduced sensory and appetite functions, oral health status, dental status such us mobility teeth and periodontitis. The elderly medical or diseases factors and consumption of certain drugs can affect absorption of nutrients in the elderly, such as lansoprazole, omeprazole, methotrexate, antiko vulsan, and antacid.<sup>9,10,11</sup> This elderly patient is a woman who has long been in the care of an internist and consumes gastrointestinal drugs, namely DOEN Antacids and Lansoprazole, so this drugs can be expected to impaired nutrient absorption in patients that result in deficiencies, especially vitamin B12 and folic acid.

Nutritional deficiencies can cause changes in the tissue structure of the oral cavity, if there is a change in the tongue papilla such as depapillation or atrophy, it can reduce a person's appetite. Vice versa, changes in the tongue papilla are often also the initial clinical signs of nutritional deficiencies, so that it can be said that nutrition affects the health of the oral cavity and thus also the opposite. Deficiencies in the intake of certain nutrients are known to trigger the development of oral lesions and can cause signs and symptoms in the oral cavity such as Atrophic Glossitis or oral mucous ulceration. Inadequate hydration also causes dry lip, which is also found in these patients.<sup>12,13,14</sup>

In this case, a 74-year-old patient diagnosed with Atrophic Glossitis, based on the history taking that complained of burning sensation, pain and numb in the oral mucosa especially on the tongue, so that she unable to feel the taste of food, making it difficult to eat and swallow. Based on the results of the extra oral examination at the beginning of the visit, which is found anemic signs in the conjunctiva, and the intra-oral examination found dorsum of the tongue looks depapillated, glossy and reddish. This leads to the diagnosis of Atrophic Glossitis which is suspected to nutritional deficiency anemia involvement. After the results of a complete blood count test were carried out, it is known that anemia in these patients was macrocytic anemia or vitamin B deficiency anemia (folic acid and vitamin B12).

In Atrophic Glossitis, the tongue will look smooth and shiny all parts of the tongue or only in a small portion. Atrophic Glossitis results from atrophy in the filiform, fungiform, foliate and circumvallata papillae. In the papilla atrophy which first disappears is the filiform, then the fungiform papilla. Atrophy of the filiform papilla has a more severe clinical effect than the abnormalities of the other papilla because the filiform papilla is the most sensitive part to stimulation and systemic changes.<sup>6,9,14</sup>

This is because of the micro vascularity of the filiform papilla, in the form of a loop that resembles a flower, and is interconnected, so that if there is a disruption in the vascularization system it will also affect the papilla. The tongue papilla cells have high levels of cell regeneration, so micronutrients are needed for cell proliferation and maintain cell

membrane thickness. Micronutrient deficiencies which lasted for a long time can lead to depapillation. Another mechanism for the pathogenesis of papillary atrophy is thought to be associated with a disruption in certain enzyme systems, circulatory disorders or nutritional deficiencies, that are important for the body and as a result of systemic diseases.<sup>15,16</sup>

If there is atrophy in the papilla, especially the filiform papilla, there may be a disruption in the intracellular process. If the condition of micronutrient deficiency does not last long then physiologically regeneration will occur and not resulted in a feature of atrophy. The papilla of the tongue condition is one of the most sensitive indicators of nutritional status, so dentists especially oral medicine specialists, must be aware of the clinical signs of Atrophic Glossitis, because this can be an indication of systemic health problems, especially anemia.<sup>16,17</sup>

Anemia is a multifactorial condition and with several pathological mechanisms. Anemia based on the criteria of the World Health Organization (WHO) is defined as a hemoglobin concentration of less than 12 g/dL in women and less than 13 g/dL in men. High anemia prevalence is found in the elderly and in women because it has many risk factors for anemia such as nutritional deficiencies, bleeding and chronic diseases.<sup>18,19</sup> Symptoms of anemia begin to appear when there is a decrease in the amount of normal hemoglobin, hematocrit and the erythrocytes count in the blood circulation.<sup>21</sup>

In this case, the patient suffers from macrocytic anemia related to folic acid and vitamin B12 deficiency, this can be seen from the results of hematological examination that found hematocrit, hemoglobin value and the number of erythrocytes lower than the normal value range, while mean corpuscular volume (MCV), and mean corpuscular haemoglobin (MCH) were increases. Vitamin B deficiency in these patients is thought to be associated with chronic gastritis in patients who have been suffering for a long time. Gastritis causes malabsorption of vitamin B12, which triggers anemia which can lead to the emergence of atrophic glossitis. The treatment of chronic gastritis that is consumed routinely by patients is Lansoprazole and Antacids. The use of this drug is also thought to play

a role in impaired absorption of vitamin B12 and folic acid.<sup>11,20,21</sup>

The anamnesis taking found that patients also experienced physical and psychological stress due to family problems. Prolonged physical and psychological stress can lead to an increase in gastric acid, causing chronic gastritis which can trigger micronutrient malabsorption and continues to anemia. Stress can also cause hyposalivation or dry mouth which worsen the appetites of the patients than will causing difficulty eating, so that nutrient intake is reduced and trigger to the occurrence of anemia.<sup>22,23</sup>

In addition to the presence of atrophic glossitis, patients also had multiple ulceration in the upper labial mucosa. This is because anemia can cause the activity of enzymes in the epithelial cells mitochondria decrease due to disruption of oxygen and nutrients transport, thereby inhibiting the differentiation and growth of epithelial cells. As a result the process of end stage differentiating epithelial cells towards the stratum corneum is inhibited and then the oral mucosa will become thinner because of loss of normal keratinization, then the atrophy occurs, and more easily to be ulcerated. Anemia also causes damage to cellular immunity, reduced bactericidal activity from polymorphonuclear leukocytes, inadequate antibody response and abnormalities in epithelial tissue. Ulcerations as found in these patient is often found in someone who had deficiencies in vitamin B12, folate, and iron.<sup>20,24</sup>

Pharmacological management for these patients, at the beginning of therapy was given a non-steroidal anti-inflammatory mouthwash containing Hyaluronid acid and aloe vera, and oral administration of Vitamin B12 2x50mcg/day and multivitamins. The mouthwash then was replaced with chlorhexidine gluconate 0.2% as an antiseptic to prevent secondary infection. After the diagnosis of macrocytic anemia decided, the oral administration of vitamin B12 2x50 mcg/day continued and the addition of folic acid become 1x5000 mcg/day.

Hyaluronid acid in mouthwash given as an anti-inflammatory that increases oral mucosa tissue hydration and accelerates healing, while the content of polyvinyl pyrrolidone (PVP) works by coating the

oral mucosa to prevent direct contact with the oral environment or by blocking the irritation pathway, and Aloe vera extract also functions as an anti-inflammatory, works by stimulating the immune system function and the growth of collagen. Chlorhexidine gluconate in this treatment given as an antiseptic that is expected to prevent secondary infections and create an oral environment conducive to the healing process.<sup>25,26</sup> Giving vitamin B12 with folic acid orally will form S-adenosylmethionine compounds involved in immune function of body cells. Vitamin B12 and folic acid also play a role and work together in the process of erythrocyte regeneration and cell reepithelialization.<sup>27</sup>

The second complete blood count test have shown good improvement but have not reached the normal value limit yet, so the next treatment plan is to continue the administration of Vitamin B12 and folic acid, Oral Hygiene Instruction (OHI) and Communication Information and Education (CIE) that prioritize tongue hygiene and balanced healthy nutritional intake to prevent reappearance of the oral manifestation such as atrophic glossitis, ulceration and dryness of the mouth. Treatment for systemic conditions is then referred to an internal medicine specialist or geriatric division.

The treatment of periodontal conditions in these patient is carried out in collaboration with the periodontia department, because the periodontitis will interfere the function of mastication and patient comfortness or convenience while eating. Periodontal treatment that has been done is to do scaling and root planning, so that after treatment the condition of tooth mobility is no longer found. Replacement the missing teeth is needed with artificial denture to improve the optimal masticatory function, especially for elderly patients. Recovery of masticatory function is important in supporting the treatment of oral and periodontal conditions especially for the management of elderly patients with nutritional deficiency anemia, because conditions that are not conducive to mastication will affect adequate nutritional intake.

Elderly is a high risk group suffering from anemia. This requires comprehensive management by collaborating health care providers from various fields of science. Early detection and correction of nutritional deficiencies can prevent further

complications, as well as improve the prognosis for patients. It can be concluded that dentists must be aware of the clinical signs of Atrophic Glossitis, because this can be an indication of systemic health problems, especially anemia.

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