



ISSN: 0976-3376

Available Online at <http://www.journalajst.com>

ASIAN JOURNAL OF  
SCIENCE AND TECHNOLOGY

Asian Journal of Science and Technology  
Vol. 09, Issue, 05, pp.8224-8226, May, 2018

## RESEARCH ARTICLE

### VITAMIN C LEVEL IN PATIENTS WITH EDEMATOUS GINGIVAL HYPERPLASIA

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#### ARTICLE INFO

##### Article History:

Received 19<sup>th</sup> February, 2018  
Received in revised form  
20<sup>th</sup> March, 2018  
Accepted 16<sup>th</sup> April, 2018  
Published online 30<sup>th</sup> May, 2018

##### Key words:

Gingival Overgrowth,  
Periodontal Infection,  
Vitamin C Deficiency, Supplement of  
vitamin C, Ascorbic acid.

#### ABSTRACT

**Introduction:** It has been suggested that vitamin C deficiency is associated with gingival inflammatory changes; however, the disorder is infrequently encountered in the time. But there are many cases of extensive gingival overgrowth caused by vitamin C deficiency associated with multifactorial causes, which needed vitamin C supplement. **Material and Method:** The clinical examination included intraoral examination with blood specimen for testing serum vitamin C to get more learning about gingival enlargement. **Results, Discussion, conclusion:** In this study, the actual level at which vitamin C in patients group was founded lower than the normal or reference vales in comparison to control group and this was explained in the table below. The aesthetic and functional difficulties are the most causes of gingival overgrowth. There are many causes for gingival overgrowth, but the etiopathogenesis cause was usually associated with factors such as the use of certain drugs or systemic disorders such as vitamin C deficiency. The patients have moderate vitamin C deficiency and the local factors like plaque and calculus may be associated with the pathogenesis of severe gingival overgrowth.

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#### INTRODUCTION

Vitamin C, also known as L-ascorbic acid or simply ascorbic acid. Its molecular formula is  $C_6H_8O_6$ , and it is a six-member carbon ring that is closely related to glucose. Vitamin C has a hydroxyl group, indicates that an OH, or hydroxide, has bonded to a carbon, an ester functional group and an alkene. Although it behaves like an acid with a carboxyl acid group, Vitamin C lacks this group and has a carbonyl double bond instead, which is characteristic of alkene groups. The carbonyl double bond, two carbons bonded to each other, has an OH bond attached to each end of its two carbons (Moser, 1991). Vitamin C is a water-soluble vitamin that is essential for humans, helping tissues and cells to grow properly and repair themselves. Vitamin C is also an antioxidant and can prevent free radicals from damaging cells in the body. Additionally, the vitamin helps in the immune system. Humans, unlike most animals, are unable to synthesize vitamin C endogenously, so it is an essential dietary component. Vitamin C is also required for the enzymatic amidation of neuropeptides, production of adrenal cortical steroid hormones, promotion of the conversion of tropocollagen to collagen, and metabolism of tyrosine and folate (Ball, 2004). Vitamin C is necessary for the replication and repair of cells throughout the body.

It is used to form the vital proteins that comprise the skin, tendons, blood vessels and ligaments in the body, the vitamin also helps the body heal quickly and maintain cartilage, teeth and bones (Andrew, 2012). Gingival overgrowth is defined as an excessive growth of periodontal tissues. Gingival enlargement is a ordinary finding in clinical practice and the appropriate treatment depends on correctly diagnosing the cause of the enlargement. Gingival enlargement associated with multiple factors is leading to gingival dimorphism (Agrawal, 2015). It is characterized by evident growth of the gingiva vertically toward the incisal edge of the clinical crown and horizontally toward the buccal-lingual area and is more prevalent in the buccal surfaces of the anterior teeth (McDonald, 2000; Stewart, 1982). Increase in size of gingiva is a common feature of gingival disease. This is clinically diagnosed as gingival enlargement or gingival overgrowth. The terms overgrowth or enlargement are descriptive terms. Hyperplasia is a histological term used to describe the increase in a number of cells. It should be distinguished from hypertrophy, which is an overgrowth due to increased size of the cells. Gingival enlargement may be caused by fibrous overgrowth or gingival inflammation or a combination of two (Newman *et al.*, 1996). The types of gingival enlargement can be classified according to etiologic factors and pathologic changes as follow:

- Inflammatory enlargement

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- Drug induced enlargement (e.g., cyclosporin A, phenytoin, nifedipine, aspirin, tetracycline, contraceptive tab) (Dongari-Bagtzoglou, 2004)
- Enlargement associated with systemic disease (e.g., leukemia, vitamin C deficiency/Scurvy, Puberty Neoplastic enlargement) (Tjwa, 2008; Bendick, 2012).
- Vitamin C deficiency/scurvy is infrequently encountered in modern industrialized nations, their inadequate intake of ascorbic acid, leads to spontaneous bleeding from periodontal tissues and abnormal gingival enlargement (Li, 2008; World Health Organization, 1999; Mandl *et al.*, 2009).

In case of prolonged deficiency of vitamin C ended to disease called scurvy, the sign and symptoms may include weakness, easy fatigue and listlessness, as well as shortness of breath, and aching joints, bones, and muscles. This disease characterized by an inability to form a normal intercellular substance in connective tissues. The results in this cases led to formation of swollen, ulcerative lesions in the gums, mouth, and other tissues that are structurally weakened (Ball, 2004).

Material and Methods:

Twenty five persons, 15 patients (10 females and 5 males) and 10 controls (7 females and 3 males) were collected from private clinic for checking about vitamin C testing. The patients were came to clinic suffering from swollen gums in the upper and lower, anterior and posterior teeth region of the jaw on both sides since 1-2 months. The patients with different ages and gender, 3 groups of patients. The collection of cases take many months.

- Old age 40 – 70 years: 6 females and 3 males. Three females and 2 males were taken aspirin tablet, 2 females and 1 male were smokers, 1 female diabetic patient, all of them partial to semi complete edentulous patients.
- Adult 20 – 39 years: 4 females and 2 males. All the females were taken contraceptive tablet, 2 males were heavy smokers.

#### Controls group

- 1 – Old age 40 – 70 years: 3 females and 1 male.
- 2 – Adult 20 – 39 years: 4 females and 2 males.

During intra – oral examination of the gingiva was reddish, spongy, edematous, soft and friable with a smooth, shiny surface and tendency to bleed on probing. Diffuse type of grade II moderate gingival overgrowth involving interdental papilla, marginal and attached gingiva extend till cervical 1/3rd of the teeth. Referred the patients for doing a test for vitamin C in sera. A blood test can be taken to measure vitamin C levels and may help to confirm the diagnosis. Reference values were established in patients who were fasting, because testing of non-fasting specimens or the use of vitamin supplementation can result in elevated plasma vitamin concentrations. This will lead to wrong results.

## RESULTS

In this study, the actual level at which vitamin C in patients group was founded lower than the normal or reference vales in comparison to control group and this was explained in the table below. The Reference Values of vitamin C : 0.4-2.0 mg/dl (Zlatuse, 2016). Interpretation Values below 0.2 mg/dL indicate significant deficiency (Zlatuse, 2016). This study explained the level of patients group as male 0.24 mg / dl and female 0.26 mg/dl in comparison to control group in respect as male 1.5 mg/dl, and female 1.24 mg / dl. Values greater than or equal to 0.2 mg/dL and less than 0.4 mg/dL are consistent with a moderate risk of deficiency due to inadequate tissue stores (Zlatuse, 2016). According to the values of our study were above the values of interpretation, so the cases not with significant deficiency but there are moderate deficiency, which was due to inadequate vitamin C supplying. The daily recommended of vitamin C for adults over age 19 is, in men 90 mg per day, in women 75 mg per day, in pregnant women 85 mg per day, and in breastfeeding women 120 mg per day (Andrew, 2012).

## DISCUSSION

The aesthetic and functional difficulties are the most causes of gingival overgrowth. There are many causes for gingival overgrowth, but the etiopathogenesis cause was usually associated with factors such as the use of certain drugs or systemic disorders such as vitamin C deficiency (Rajendran, 2006). There is many local factors as plaque, calculus, which are responsible for gingival enlargement. However, the vitamin C deficiency was not always happen in the modern sociality, so the collection of our cases take many months, but vitamin C deficiency when treated all the signs and symptoms missed (Patil, 2014). Vitamin C very important for maintaining the body health. The recent studies explained the biological roles and functions of vitamin C helps to repair and regenerate tissues, protect against heart disease, aid in the absorption of iron, prevent scurvy, and decrease total and LDL cholesterol and triglycerides. Research indicates that vitamin C may help protect against a variety of cancers by breaking the free radicals, and helping neutralize the effects of nitrites (preservatives found in some packaged foods that may raise the risk of certain forms of cancer), also plays a major role in collagen biosynthesis and maturation, and it is essential for the maintenance of the basal membrane (Mandl, 2009). In our study, the patients with moderate vitamin C deficiency, because the need for vitamin C can be increases by the use of aspirin, oral contraceptives, tetracycline, and a variety of other medications. Psychological stress and advancing age also tend to increase the need for vitamin C. Among the elderly, lack of fresh fruit and vegetables often, imbalanced diet, people go on fat diets, people with low income who tend to buy foods with low content vitamin C, pregnant and breast feeding women, and smokers because smoking affects the absorption of vitamin C from foods and also vitamin C is used up in the body more quickly in those who smoke (Andrew, 2012).

**Table 1: The level of vitamin C in patients in comparison with the control groups**

Level of Vitamin C in Patients group mg/dl					Level of Vitamin C in Control group mg/dl				
Sex	Age yrs	No.	Mean X	SD	Sex	Age yrs	No.	Mean X	SD
Male	20 – 70	5	0.24	0.09	Male	20 – 70	3	1.5	0.26
Female	20 - 70	10	0.26	0.09	Female	20 – 70	7	1.24	0.36

In our study, the patients presented with some of the signs and symptoms typical of vitamin C deficiency, bleeding and edematous gingiva and nutritional deficiency. Patients were treated based on clinical manifestation and depending on blood test for vitamin C. We believe this cases will be a useful reminder of the pathological effects of vitamin C deficiency on gingival inflammatory changes. Dentists should be aware of the clinical oral manifestation of vitamin C deficiency, because the presentation of the patient with scurvy may be occur.

### Conclusion

The patients have moderate vitamin C deficiency and the local factors like plaque and calculus may be associated with the pathogenesis of severe gingival overgrowth. Gingival enlargement is due to many factors and complex in nature, which may be in response to various relations between body health and environment. Gingival overgrowth considered as effective role to reduced the quality of life and may result in serious emotional and social problems due to esthetics and functions.

### Acknowledgement

Just wishing to recognize the valuable help of all provided during my research. Without their care and funding, it was impossible to reach the goal. I would like to pay special thankfulness, warmth and appreciation to the persons who made my research successful and assisted me at every point. A lot of thanks also to my patients for acceptance to work with me in this research in order to get the benefit of research in our community. Last but not the least; emotional support can also be considered as a key to success. So, I wish to thank such supporters like my husband, daughters and sons, and friends\

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