Association of drug-induced gingival enlargement (calcium channel blockers) and local factors: Who is the culprit?

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Abstract

Background: Several drugs are used for the management of hypertension. Among these drugs, calcium channel blockers (CCBs) are the most potent and generally used drug. Gingival enlargement is a recognized outcome of the administration of CCBs. Other drugs which cause gingival enlargement are antiepileptic drugs (phenytoin) and immunosuppressants (cyclosporine). The role of bacterial plaque in the overall pathogenesis of drug-induced gingival enlargement is not clear as some studies indicate that plaque is a prerequisite for gingival enlargement, whereas others suggest that the presence of plaque is a result of its accumulation caused by the enlarged gingiva.

Aim: The aim of this study is to find the association of local factors with CCBs-induced gingival enlargement.

Conclusion: The observations made in this report support that the presence of local factors augments the degree of the gingival enlargement present.

Significance: As the prevalence of CCB use is relatively high in the population, especially among patients with cardiovascular disease, it is important that medical professionals are aware of the association between drug-induced gingival enlargement and local factors so that they can emphasize thorough home care and professional cleaning in the treatment of drug-induced gingival enlargement.

Keywords
Calcium channel blockers, gingival enlargement, home care, local factors, professional cleaning

Introduction

Gingival overgrowth/enlargement is characterized by an increased gingival volume, including an increased number of cells and by an accumulation of extracellular matrix within the gingival connective tissue, particularly the collagenous components.¹ Gingival enlargement may generate esthetics, mastication, and speech problem and it may also cause impaired nutrition, reduced oral hygiene maintenance, and increased risk of caries and periodontal diseases.² The enlargement is usually generalized throughout the mouth, but it is more severe in the maxillary and mandibular anterior region. It occurs in areas in which teeth are present, not in edentulous spaces.³ The prevalence of gingival enlargement has been estimated to vary between 30% and 50% in nifedipine-treated patients.⁴ Among the several pathogenesis of drug-influenced gingival enlargement, the plaque-induced inflammatory changes are pivotal. The nature of the relationship between plaque and the expression of gingival enlargement is unclear.⁵⁻⁶

The role of bacterial plaque in the overall pathogenesis of drug-induced gingival enlargement is not clear as some studies indicate that plaque is a prerequisite for gingival enlargement,⁹ whereas other suggest that the presence of plaque is a consequence of its accumulation caused by the enlarged gingiva. Therefore, the purpose of this study is to find the association of local factors with calcium channel blockers (CCBs)-induced gingival enlargement.

Scenario 1

A 55-year-old female reported to the department of periodontics with the chief complaint of gingival enlargement; her medical
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History revealed that she was hypertensive and was taking CCBs from the past 7 years. Clinical examination revealed gingival enlargement more severe in the areas, where local factors were higher (upper, lower right region, and anterior region). Gingival enlargement was not seen in the left region. Enlargement and local factor were more severe in mandibular anterior lingual region [Figure 1].

Bokenkamp A gingival enlargement scoring is depicted as follows: [10]

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Scenario 2

A 52-year-old male reported to the department of periodontics with the chief complaint of gingival enlargement; his medical history revealed that he was hypertensive and was taking CCBs from the past 5 years. Clinical examination revealed that gingival enlargement and local inflammatory factors were more severe in maxillary and mandibular anterior region [Figure 2].

Bokenkamp A gingival enlargement index is depicted as follows: [10]

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Scenario 3

A 47-year-old female, hypertensive, reported to the department of periodontics with a chief complaint of gingival inflammation. She gave a medical history of taking CCBs from the past 7 to 8 years. Her clinical examination revealed gingival enlargement in maxillary and mandibular right posterior region and also in mandibular anterior region. It was also noted that more subgingival deposits were seen in the same area [Figure 3].

Bokenkamp A gingival enlargement index is depicted as follows: [10]

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Scenario 4

A 58-year-old female was hypertensive and was taking CCBs from the past 10 years. Clinical examination revealed generalized

Figure 1: Clinical examination of the patient revealing gingival enlargement, especially more severe (red arrow) in the areas, where local factors were more (yellow arrow) upper, lower right region and anterior region. Gingival enlargement is not seen in the left region

Figure 2: Clinical examination revealing severe gingival enlargement in maxillary and mandibular anterior region. Local inflammatory factors were also seen in anterior region
gingival enlargement and local factors. It was observed that severity of enlargement was more where local inflammatory factors were present [Figure 4].

Bokenkamp A gingival enlargement index is depicted as follows: \[10\]

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Discussion

Drugs associated with gingival enlargement can be mostly divided into three categories: Anticonvulsants, CCBs, and immunosuppressants. CCBs, especially dihydropyridines group, produce gingival hyperplasia. Approximately 10% of patients taking nifedipine develop clinically significant gingival hyperplasia. It has the potential of cosmetic implications and provides new niches for the growth of microorganisms and is of serious concern for both the patient and the clinician. Cardiovascular diseases are the common finding among people owing to today’s life style. CCBs are one of the most commonly used drugs for the management of cardiovascular disorders. Gingival overgrowth is now an accepted unwanted effect associated with many of the CCBs. Of this large group of drugs, the dihydropyridines (i.e. nifedipine, nitrendipine, felodipine) are the agents most frequently implicated. Any plaque-induced inflammatory changes within tissues will worsen the appearance of drug-induced gingival overgrowth. This finding suggests causality, with a patient’s oral hygiene being a significant risk factor for both the growth and the expression of drug-induced gingival hyperplasia,\[11-14\] although reports to the opposing have also been reported.\[15\] Most of the evidences supporting the association between bacterial plaque and drug-induced gingival overgrowth have been derived from cross-sectional studies, and in such studies, it is difficult to conclude whether plaque is a causative factor to or an outcome of the gingival changes. Although there may be some dispute as to the role of plaque and gingival inflammation in drug-induced gingival overgrowth, there is no doubt that improving a patient’s oral hygiene and reducing the inflammatory component in the gingival tissue by nonsurgical means do have an impact on this unwanted effect. Despite such measures, there still remains a group of patients who develop overgrowth irrespective of their oral hygiene or periodontal condition.\[16\] In such patients, other risk factors may be more significant. In the present report, we have observed that gingival overgrowth occurs and it is more severe in patients with CCBs therapy, in the area where local inflammatory factors were present. According to Chiu et al., hyperplastic change of gingiva starts only in areas displaying signs of inflammation, but not in healthy areas.\[17\] Some investigators believe that inflammation is a requirement for the development of the enlargement, which, therefore, could be prevented by plaque removal and fastidious oral hygiene.\[18\] Control of gingival inflammation and maintenance of effective oral hygiene are key factors in preventing and managing gingival overgrowth associated with this class of medications.\[19\] A marked reduction of the enlargement occurs following scaling and root planing.\[20\] Adequate plaque control is a prime factor in the prevention and control of drug-induced gingival enlargement.\[21\] Within limitation, this case report suggests that the presence of local factors augments the degree

Figure 3: Clinical examination revealing gingival enlargement in areas where local factors were also present

Figure 4: Clinical examination revealing generalized gingival enlargement and local factors. We have observed that severity of enlargement was more where local inflammatory factors were present
of the gingival enlargement present. It is necessary that medical professionals are aware of the association between drug-induced gingival enlargement and local factors so that they can emphasize thorough home care and professional cleaning in the treatment of drug-induced gingival enlargement.

Conclusion

In this perspective, we have observed the positive correlation between local factors and gingival enlargement; this case reports support that the presence of local factors augments the degree of the gingival enlargement present. Thus, we emphasize the importance of thorough home care and professional cleaning in the treatment of drug-induced gingival enlargement.

References
