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Case Studies

A STUDY ON AMLODIPINE INDUCED GINGIVAL HYPERPLASIA

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Abstract: Amlodipine is a calcium channel blocker which has main action on vascular smooth muscles. It blocks L-type calcium channels and causes vasodilatation. Gingival hyperplasia is a rare adverse effect of amlodipine which can happen in 1-10%cases. A 53 year old male patient was found to have gingival hyperplasia after treating with amlodipine as add-on therapy for hypertension

Key Words: Amlodipine, adverse drug reaction, chronic kidney disease, gingival hyperplasia.

INTRODUCTION

Gingival hyperplasia is considered to be a serious adverse effect due to its unaesthetic appearance and also due to its various complications like gingival bleeding, pain, teeth displacement and periodontal disease. Drug induced gingival overgrowth may be due to hyperplasia of gingival epithelium or of submucosal connective tissue or of both, the major drugs that causes gingival hyperplasia are phenytoin (anti-convulsant), cyclosporine (immunosuppressant) and nifedipine and amlodipine (calcium channel blockers). They interact with epithelial keratinocytes, fibroblasts and collagen, can lead to an overgrowth of gingival tissue in susceptible individuals.

The major risk factor of gingival hyperplasia are poor oral hygiene, presence of dental plaques in which drugs can accumulate and susceptibility of individuals fibroblast and keratinocytes to the drugs and the number of Langerhan's cells present in oral epithelium. [1][2][3][4]

Amlodipine is a calcium channel blocker which belongs to the class dihydropyridines. It bind to the α-1 subunit of L-type calcium channels preferably on the vascular smooth muscles, block calcium entry and reverse vasospasm as it is majorly used in hypertension and variant angina.

Amlodipine is given in the dose of 5-10 mg once daily as it has a long duration of action. It is 93% - 98% protein bound with a volume of distribution of 21L/Kg. it is metabolized in liver to inactive metabolite and is mainly excreted via urine.

The major side effects of amlodipine are flushing, headache, constipation, heart block, peripheral edema. Very rare reaction includes hepatitis and hyperglycemia. Gingival hyperplasia is a rare adverse effect of amlodipine which has prevalence rate in between 1-10%. [5][6][7]

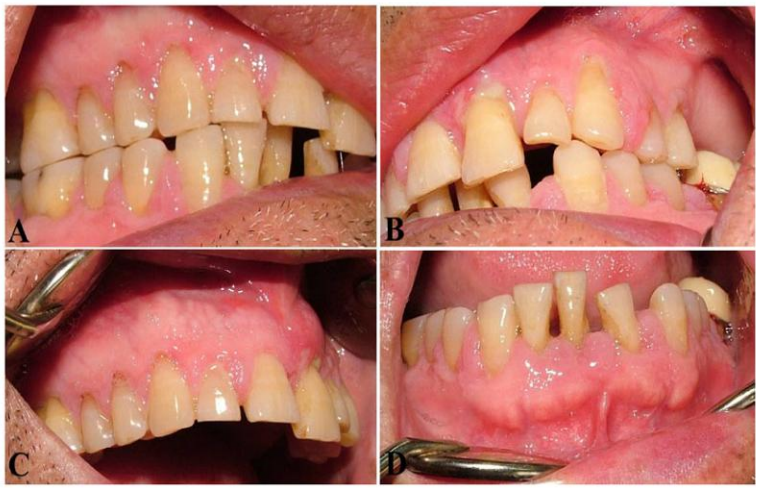

Figure 1: Clinical presentation of ginfival hyperplasia. Fig. A and B shows the left and right sides, respectively. Fig. C and D are the maxillary and mandibular views.

Case Report

A 53 year old male patient was presented in the department of nephrology of a tertiary care teaching hospital for his routine review. The patient had chronic kidney disease who is on his regular medications. He also had diabetes mellitus and hypertension. On examining the patient the physician found gingival hyperplasia on taking the history, the patient revealed that a week before he had consulted his general physician, who prescribed with amlodipine 10 mg once daily PO. The nephrologist advised the patient to stop amlodipine 10 mg OD and was prescribed with a suitable substitute for the management of hypertension and asked for review after 3 days. On review the gingival hyperplasia was completely cured. It was a pure demonstration of amlodipine induced gingival hyperplasia. On reviewing the literature, it was found out that gingival hyperplasia is a rare side effect of amlodipine and on analyzing the prescription none of other drugs are producing gingival hyperplasia except amlodipine. The case was duly documented and reported.

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DISCUSSION

The definition of ADRs by the World Health Organization is a 'response to a medicine that is noxious and unintended, and that occurs at doses normally used in humans. Gingival hyperplasia is a serious adverse drug reaction caused by anti-convulsants, dihydropyridines such as nifedipine and amlodipine, immuno-suppressants etc.

The clinical manifestation of gingival enlargement or gingival overgrowth is considered to be a serious clinical problem due to its unaesthetic appearance and also due to the nitches that leads to the development of periopathogenic bacteria that leads to gingival bleeding, pain, teeth displacement and foul smell. The prevalence of gingival hyperplasia in patients taking amlodipine was reported to be 3.3% (Jorgensen, 1997). Gingival hyperplasia usually presented as enlarged interdental papillae and resulting in a lobulated or nodular morphology (fig 1). Most studies show an association between the oral hygiene status and the severity of drug-induced gingival hyperplasia. This suggests that plaque-induced gingival inflammation may be important risk factor in the development and expression of the gingival changes.

Pathogenesis

Since only a subset of patients treated with this medication will develop gingival overgrowth, it has been hypothesized that these individuals have fibroblasts with an abnormal susceptibility to the drug. It has been showed that fibroblast from overgrown gingiva in these patients are characterized by elevated levels of protein synthesis, most of which is collagen. It also has been proposed that susceptibility or resistance to pharmacologically induced gingival enlargement may be governed by the existence of differential proportions of fibroblast subsets in each individual which exhibit a fibrogenic response to this medication.

It is also postulated that the drug molecules may interfere with the synthesis and functioning of collagenases that lead to the overgrowth of gingival mucosa and sub-mucosa.[8][9][10]

Treatment

The patients who are presenting with drug-induced gingival hyperplasia can be treated by discontinuing the drug or by finding a suitable substitute. The patients must be counseled regarding the importance of oral hygienity. It is the responsibility of the physician and the pharmacist to advice the patients regarding the various ADRs of the drug and to give advices regarding the various preventive measures.

Gingival hyperplasia can also be managed through initial periodontal therapy, followed with surgical gingivectomy and CO_2 laser treatment.[1][8][9]

SUMMARY

A patient presented with gingival hyperplasia which was found to be an idiosyncratic reaction of the amlodipine. From the existing literatures, amlodipine shows 1-10% of gingival hyperplasia. It is mainly because of the actions on fibroblasts of gingival sub-mucosa. On analysis, the ADR presented by the patient was completely reversed by the cessation of Amlodipine. This case study shows that gingival hyperplasia is an adverse effect of amlodipine.

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