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A study based on cardiovascular medicine polypharmacy and its harmful effects on the oral cavity

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Abstract

Aim of the study: To determine the nature of oral manifestations secondary to use of cardiovascular medicine.

Methods: The study's objective is to identify the type of oral symptoms and signs brought on by the usage of cardiovascular medications. 150 patients who met the inclusion criteria and were between the ages of 20 and 70 made up the study's sample. The out-patient department's patients were first screened to make sure they met the inclusion and exclusion requirements.

Results: A total number of 150 patients participated in the present study and among them 80 were males and 70 females. The mean age of males in the study group was 52.13 ± 10.86 and for females was 50.95 ± 11.84 and among them majority of patients had coronary artery disease (73%) which reflects high frequency this condition in the study group. In the present study the results indicate that 61 out of 150 patients (43.5%) had clinically detectable or recorded oral symptoms or signs that might represent the drug induced effects on oral health. Drug induced effects on oral health secondary to cardiovascular medicine were seen 37.6 % of males and 50.7% females. Subjects were divided into 3 groups based on duration of usage of medicine which includes

30 patients who have used medicine for less than a year.

40 patients who had used medicine for one to three years.

30 patients who have used medicine for longer than three years

Keywords: Heart Disease Cardiovascular, Medicine, Cavity,

Introduction

Cardiovascular disease is the main cause of morbidity and mortality globally. The worldwide prevalence of cardiovascular disease is higher in underdeveloped

countries than in industrialized ones. The most prevalent cardiovascular condition, ischemic heart disease (IHD) or coronary heart disease (CHD), accounts for 25–30% of deaths in the majority of developed nations. The population is more likely to die from heart disease. [2]According to the World Health Report 2002, cardiovascular diseases will eventually be the primary cause of death and disability. Many cardiovascular medicines (CVD) have the potential to cause negative oral drug responses. While many ADRS go away when the medication is stopped or the dosage is lowered, some are more severe and last longer. Consequently, ADRS is one of the major causes of morbidity and mortality. It is unclear exactly what causes oral undesirable responses linked to medicine ingestion. Although medication-induced oral responses are sometimes dismissed by the medical community as unimportant concerns, they are nonetheless thought to be a very common phenomenon.

Oral adverse drug events associated with cardiovascular medicines include xerostomia, gingival overgrowth, aphthae/oral ulcerations, scalded mouth syndrome, taste alterations, cheilitis, glossitis, angioedema, thrombocytopenia, epithelium sloughing, and lichenoid/lichen planus reactions. Alpha and beta-adrenergic blockers, ACE inhibitors, calcium channel blockers, diuretics, antiarrhythmics, statins, potassium channel openers, and angiotensin receptor blockers are the main classes of cardiovascular medicine (CVD) that have been shown to cause, are suspected to cause, or are likely to cause these oral adverse drug reactions. Oral adverse drug responses are associated with several CVD medicines.[5] cardiovascular disease trends, complications, and related treatments have an impact on dental health and treatment. Cardiovascular disease is being recognized in a growing number of dental patients, who are also being treated with multidrug therapy and developing more severe forms of the debilitating condition.

Cardiovascular diseases include chronic heart failure, hypertension, coronary artery disease, and congenital cardiovascular problems. Even though these diseases have a high death rate, people from all walks of life are affected by their morbidity, which significantly lowers the quality of life.

This study addresses the common oral adverse effects of cardiovascular medications. Medicines used to treat hypertension, such as ACE inhibitors, can have a negative impact on oral health such as ramipril, lenetroprol, enalapril, and leneptopril, which cause xerostomia and lichenoid reactions. Calcium channel blockers including amlodipine, diltiazem, nifedipine, and verapamil cause gingival overgrowth, and angiotensin antagonists like losartan and candesartan cause aphthous ulcers and angioedema of the lips. Aphthous ulcers are brought on by central sympatholytic such as methyldopa and clonidine. Gum bleeding is a side effect of vasodilators such as minoxidil, diazoxide, and hydroxyzine. Patients with hypertension may occasionally exhibit oral signs and symptoms such as gingival hemorrhage and hyposalivation. Local irritating factors like calculus may cause gingival bleeding, and hyposalivation in individuals using hypertension medicine like diuretics may be linked to a sustained increase in both systolic and diastolic blood pressure as well as a decrease in unstimulated saliva. Furthermore, as a side effect of their pharmaceutical use, they may occasionally experience lichenoid responses or lichen planus-like lesions on the buccal mucosa, usually in the posterior area.

Adverse oral effects can result from anti-anginal medications such as nitrates, beta-blockers, calcium channel blockers, potassium channel openers, and anti-arrhythmic medications such as membrane stabilizing agents, calcium channel blockers, beta-blockers, agents widening action potential, and antiadrenergic agents. Aldosterone, diuretics, ionotropic medications, ACE inhibitors, angiotensin antagonists, vasodilators, beta-adrenergic blockers, and ACE Inhibitors are among the medications used to treat congestive heart failure. Xerostomia, dysgeusia, glossopyrosis, lichenoid reactions, stomatitis, ulceration, bullous diseases, angioedema, and salivary gland enlargement are often reported side effects of these medications that affect the oral cavity. Oral illnesses and disorders are known to be caused by many systemic causes, including drug consumption. It is unclear how frequently oral adverse events resulting from medicine ingestion occur and what causes them. Medicine can have negative effects on oral health that are observed in daily practice; nevertheless, because many adverse oral drug reactions (ADRS) go unreported, it is challenging to assess the true rate of ADRS.

Aims and Objectives

Aim of the present study was to determine the nature of oral manifestations secondary to use of cardiovascular medications. The goals are to identify the range of adverse oral drug effects caused on by cardiovascular pharmaceuticals, evaluate the impact of the drug regimen on the patient's oral health and quality of life, and establish whether these aspects may have an impact on adherence to the treatment regimen.

Materials and Methods

This hospital-based study was conducted in Hospital's outpatient cardiology department. Inclusion criteria for this study included 150 patients between the ages of 20 and 70, outpatients at the cardiology department, males and females with a diagnosis of cardiovascular diseases, and patients receiving treatment with medications for the same cardiovascular disease for at least three months. Patients with cerebrovascular, CNS, and renal diseases as well as non-ambulatory cardiac patients meet the exclusion criteria. In this cross-sectional study, patients were first chosen from the outpatient department based on their ability to meet the inclusion and exclusion criteria. Patients were told about the study, its goal, and the voluntariness of participation. They were then asked to complete the questionnaires, and after getting their informed consent, an oral examination was conducted.

The general Proforma was then given out, which contained the initial demographic information (age, residence, etc.) as well as specifics on cardiovascular disease, its treatments, weight, height, and blood pressure, as well as information on tests (ECG, full blood picture, etc.) performed over the preceding month. A comprehensive history of cardiovascular disease and the medicine used to treat it has been acquired with the support of a cardiologist, the patients, and their hospital case files and treatment charts. After asking them to complete a questionnaire, an oral examination was conducted. A thorough history of oral symptoms such xerostomia, taste changes, or burning sensation was obtained. With the aid of a sterilized mouth mirror, a straight probe, and a periodontal probe, a thorough clinical examination of the oral cavity was carried out to check for any oral mucosal lesions such as lichenoid reactions, gingival overgrowth, aphthous ulcers, angioedema, etc. To validate the hyposalivation, the flow rate of saliva was measured. The patient was asked to spit into a graduated, sterile container once every minute for a total of five minutes, and the salivary flow

rate was measured in milliliters per minute (ml/min). Giving the patient feedback and notifying the concerned cardiologist in case there were any serious adverse mouth effects marked the conclusion of the interview and oral examination.

Results

A total of 150 patients were included in the study. The patient age ranged from 20 to 70 years comprising of 80 males and 70 females. The mean age of males was 52.13 ± 10.86 and for females was 50.95 ± 11.84. Frequencies & percentages of males, females, cardiovascular risk factors, oral signs & symptoms were tabulated. Subjects were divided into 3 groups based on duration of usage of medicine which includes

30 patients who have used medicine for less than a year.

40 patients who had used medicine for one to three years.

35 patients who have used medicine for longer than three years

Table 1: Demographic distribution and tabulation of oral manifestations of study samples

Variable		Frequency	%
Males		80	53.3
Females		70	46.1
Cardiovascular diseases	Coronary artery disease	125	79.1
	Valvular heart disease	31	19.6
	Congenital heart disease	2	1.2
Oral signs & symptoms		69	43.7
	Gingivitis	35	22.2
	Periodontitis	80	50.6
	Xerostomia	58	36.7
	Dysgeusia	34	21.5
	Glossopyrosis	20	12.7
	Xerostomia+ dysgeusia	23	14.6
	Xerostomia+ Glossopyrosis	12	7.6
	Xerostomia+Dysgeusia+ Glossopyrosis	7	4.4
	Bald tongue	2	1.3
	Geographic tongue	2	1.3
	Petechiae	1	0.6
	Lichenoid reaction	1	0.6

Discussion

Numerous cardiovascular medicines (CVDS) have been shown in trials and literature to cause a variety of adverse effects that may negatively impact oral health. Since many of them have no symptoms, it is thought that they go unreported. An increasing number of elderly persons are present in the population due to the accessibility of better healthcare facilities. Because so many labor-saving devices are available today; modern lifestyles are linked to decreased physical activity. The modern society is more stressed now than ever before as a result of increased competitiveness. Currently, dietary trends favor consuming more processed foods and food from outside restaurants that are laden with ingredients like cheese, cream, and preservatives.

The combination of these factors has led to an increase in cardiovascular disease prevalence. The probability of people developing cardiovascular problems rises with age. The majority of cardiovascular disease patients are put on a regimen of medications meant to lower the risk of cardiovascular illnesses worsening. These medications typically include beta-blockers, ACE inhibitors, anticoagulants, antiplatelet agents, antihypertensive agents, diuretics, and vasodilators.

The typical course of treatment is lengthy and frequently lasts the patient's entire lifespan. Compliance with the recommended regimen and a change in the patient's lifestyle are required for optimal cardiovascular health.

The cardiologist frequently assesses the cardiac, renal, and hepatic function of patients with cardiovascular

illnesses who come in for routine follow-up. Patients' oral health is often overlooked and not given much consideration.

The goal of this study was to determine whether oral manifestations caused by the administration of these multidrug combination regimens and the impact of the drug regimen on the patient's oral health and quality of life could be a factor that influences patient compliance with the drug regimen.

The study's goals included identifying the different manifestations that could arise from taking cardiovascular medicine, as well as determining how the patient's oral health and quality of life were impacted by the regimen and whether these elements might affect adherence. The study's volunteers fully complied with all requirements for inclusion and exclusion and followed all instructions and procedures.

Further research and investigations on this topic in individuals using various cardiovascular medicines are required to rule out various mixed effects and their aftereffects given the combined pattern of drug-induced effects on oral health in the current study.

The overall pattern of drug-induced effects on oral health for xerostomia, dysgeusia, and gloosopyrosis individually was higher in females than in males, and the association between gender and samples exhibiting xerostomia and dysgeusia symptoms was not statistically significant (p-value 0.001), except the association between gender and positive glossopyrosis samples.

These elements could also have a role in the aggravating elements of oral side effects in female patients who were elderly, approaching menopause, or amid menopause. Some of them might be dealing with unrecognized mental health problems. Glossopyrosis and dry mouth are the primary pre- and postmenopausal symptoms, and they may raise your risk of oral mucosal and oral health conditions like candidiasis.

According to Table 2 of the current study, 35 patients (22.2%) with a gender split of 16 females to 19 males had gingivitis.

The duration of drug usage contributes to various factors affecting the oral cavity, as compliance with medicine may alter them. Patients with longstanding drug usage may also be familiar with the effects on oral health.

In the present study, some of the patients have reported that they have discontinued the medicine for some time due to severe side effects like xerostomia and glossopyrosis, but again, due to health issues, they have resumed the usage of cardiovascular medicine. Some of them have discontinued the usage of medicine due to other reasons like severe dizziness, fainting, lightheadedness, insomnia, confusion, hallucinations, dizziness, fatigue, diarrhea, nausea, and vomiting, as these are the most common side effects of most of the cardiovascular medicine that were commonly prescribed to patients with cardiovascular diseases.

There was a strong correlation between participants with xerostomia and dysgeusia and the length of drug use. Based on these findings, more patients with less than a year of usage had xerostomia and dysgeusia than other patients. In this research there were 4 patients (7.4%) in the current study who had xerostomia and glossopyrosis out of 37 individuals whose drug use had lasted less than a year. Five patients (8.8%) out of 49 patients with drug use lasting between one and three years had xerostomia and glossopyrosis. Three patients (6.4%) out of 38 individuals with a drug use history of more than three years had xerostomia and glossopyrosis. There is no statistically significant link between people with xerostomia and glossopyrosis and the length of drug use.

These findings indicate that xerostomia and glossopyrosis were more prevalent in participants with 1 to 3 years of drug use, according to the period of drug use.

To summarize the results in the present study, Patients with a duration of drug use under one year and patients with a duration of drug use between one year and three years suffered from glossopyrosis more frequently than other patients. Xerostomia and dysgeusia as distinct entities were more prevalent in patients with a duration under one year than in other patients. In patients who had used medicine for less than a year, xerostomia with dysgeusia was more frequent, and xerostomia along with glossopyrosis was more frequent in those who had used medicine for one to three years.

This is a novel component of the current study that takes drug duration into account when analyzing its impact on oral health. In order to fully explore the effects of the medications on oral health based on usage length, additional research is required because there is a dearth of available literature in this area of study. The information in this area prompts us to reconsider drug compliance, duration of use, and impacts on oral health.

Patients who have used medications for a long time may stop using them in the interim for a variety of reasons, and their commitment to the prescribed medication affects both the disease's prognosis and the impacts on oral health.

Many patients who have used medicine for a long time, particularly those who have used them for 1 to 3 years or longer, have admitted that they are not fully compliant for a variety of reasons, including drug-induced severe dizziness, fainting, lightheadedness, insomnia, confusion, hallucinations, dizziness, fatigue, diarrhea, nausea, and vomiting as well as drug-induced effects on the oral health, such as severe xerostomia, altered taste, and glossopyrosis.

Patients who had been taking their prescriptions for less than a year had a higher prevalence of oral signs and symptoms brought on by cardiovascular medicine, which may be the result of insufficient compliance. However, some patients who have been on cardiovascular medications for a while have grown acclimated to the impacts on their oral health. Some patients experience drug-induced impacts on oral health that are not as severe as the cardiovascular disease they have, and cardiologists might overlook these consequences for a variety of reasons.

Conclusion

The effects of medicine on oral health are frequently observed by oral physicians or oral medicine specialists, and dental team members. The majority of people with cardiovascular disease will frequently be taking multiple medications, which will have adverse drug-induced impacts on oral health. A broad range of medications often results in several undesirable oral manifestations, and patients may occasionally develop tolerance to these. These could be misdiagnosed as primary oral lesions and get ineffective care.

The ability to refer a patient to the doctors or the cardiologist, who can then decide whether it is appropriate to prescribe an alternative therapy or to continue with the same treatment, is made possible by oral physicians and other dental team members' awareness of drug-induced effects on oral health caused by cardiovascular medications. The comprehensive medication history taken into account by the oral physician will be useful to assess the drug-induced effects on oral health, so that the patients can be advised on the most appropriate course of action to reduce their

discomfort and enhance their health and quality of life. If we follow the patient-centered approach and make it mandatory for secondary and tertiary hospitals to include oral medicine specialists in their treatment protocols, patients will be more comfortable and satisfied with the process. Oral medicine specialists play a crucial role as a bridge between medical doctors and their patients in screening, diagnosing, and suggesting necessary treatment modalities for oral adverse effects. Unfortunately, multispecialty hospitals do not engage oral medicine specialists as part of a multicentric therapy approach.

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