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PREVALENCE OF PERIODONTITIS IN PATIENTS WITH ISCHEMIC HEART DISEASE

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ABSTRACT

Numerous studies have reported positive associations between periodontal infections and clinical cardiovascular disease (CVD). Among these studies, a pattern has emerged in which findings are markedly stronger for stroke as compared to coronary outcomes. One possible explanation for these trends is that periodontal infections might contribute to clinical CVD through risk factors that are more strongly linked to stroke than to coronary pathophysiology. While both hypertension and abnormal cholesterol profiles are established risk factors for stroke and coronary heart disease (CHD), it is generally accepted that hypertension is a stronger risk factor for stroke while cholesterol profiles are more strongly linked to CHD. Therefore, if periodontal infections contribute to the development of hypertension but have little or no influence on lipid metabolism and cholesterol levels, one would expect periodontal infections to be more strongly associated with stroke, as compared to CHD. Periodontitis is a local inflammatory process mediating the destruction of periodontal tissues, triggered by bacterial insult. This may be caused by a decreasing role of periodontitis as a risk factor in increasing age and by differences in health awareness between sexes. Periodontitis was associated with cerebral ischemia caused by large-artery atherosclerosis, supporting the hypothesis of a possible link between periodontitis and atherogenesis or complications of atherosclerosis. There was also a strong association with cryptogenic stroke and, to a lesser degree, with cardioembolism.

Key Words: Periodontitis, Ischemic heart disease, CVD, Atherogenesis.

INTRODUCTION Periodontitis

Inflammation around the tooth" - it is a serious gum infection that damages the soft tissue and bone that supports the tooth. All periodontal diseases, including periodontitis, are infections which affect the *periodontium*. The periodontium are the tissues around a tooth, tissues that support the tooth [1]. With periodontitis, the alveolar bone around the teeth is slowly and progressively lost. Microorganisms, such as bacteria, stick to the surface of the tooth and multiply - an overactive immune system reacts with inflammation [2]. Dental plaque forms on teeth - this is a pale-yellow biofilm that develops naturally on

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teeth. If is formed by bacteria that try to attach themselves to the tooth's smooth surface [3]. Brushing teeth gets rid of plaque, but it soon builds up; within a day or so. If it is not removed, within two or three days it hardens into tartar [4]. Tartar is much harder to remove than plaque. Another name for tartar is calculus. Getting rid of tartar requires a professional - you cannot do it yourself. Plaque can gradually and progressively damage teeth and surrounding tissue. At first, the patient may develop gingivitis inflammation of the gum around the base of the teeth. Persistent gingivitis can result in pockets developing between the teeth and gums. These pockets fill up with Bacterial toxins and our immune system's bacteria. response to infection start destroying the bone and connective tissue that hold teeth in place. Eventually the teeth start becoming loose, and can even fall out [5].

Signs and Symptoms

Inflamed (swollen) gums, gum swelling recurs, Gums are bright red, sometimes purple, Gums hurt when touched, Gums recede, making teeth look longer, Extra spaces appear between the teeth, Pus may appear between the teeth and gums, Bleeding when brushing teeth, Bleeding when flossing, Metallic taste in the mouth, Halitosis (bad breath), Loose teeth, The patient's "bite" feels different because the teeth do not fit the same.

Ischemic Heart Disease

Ischemic Heart Disease, also known as Coronary Artery Disease, is a condition that affects the supply of blood to the heart. The blood vessels are narrowed or blocked due to the deposition of plaque on their walls. This reduces the supply of oxygen and nutrients to the heart muscles, which is essential for proper functioning of the heart. This may eventually result in a portion of the heart being suddenly deprived of its blood supply leading to the death of that area of heart tissue, resulting in a myocardial infarction or heart attack [6].

Arterial plaque: Plaque that accumulates on the inner walls of your arteries is made from various substances that circulate in your blood. These include calcium, fat, cholesterol, cellular waste, and fibrin, a material involved in blood clotting [7].

Dental plaque (Biofilm): Dental plaque has been defined as "a specific but highly variable structural entity consisting of micro-organisms and their products embedded in a highly organized intercellular matrix." It represents a true biofilm consisting of a variety of microorganisms involved in a wide range of physical, metabolic and molecular interactions [8].

Periodontits A Risk Factor In IHD

Periodontitis can be a risk factor in patients with coronary artery disease. Active periodontal inflammation may contribute to a prothrombotic state via recurrent bacteremia, platelet activation, and elevated clotting factors, thereby increasing the risk of cardio embolism and cryptogenic stroke. Periodontitis is an inflammatory condition which can aggravate the formation CRP which is a marker of inflammation. Microorganism can be carried by blood from infected periodontiun and cause their accumulation around atherosclerotic plaque cause plaque instability and its subsequent rupture and biofilm dispersion [9].

MATERIALS AND METHODS

Primary and secondary objectives

Primary objective: To assess the prevalence of chronic periodontitis in patients with a history of Ischemic heart disease.

Secondary objective: To assess the level of C - reactive protein in these patients.

Description of Study Design

The is a type of cross sectional, observational study where questionnaire method, dental examination and blood test for C-reactive protein was used for the collection of data. Data was collected from patients with ischemic heart disease in Medica Superspeciality hospital during 3 months of study period. In this study 50 patients were recruited. Data was collected to understand and assess the prevalence of periodontitis in IHD patients and the change of blood levels of CRP which is a marker of inflammation.

Study duration

The study took place over a duration of three months. For each patient a questionnaire based study was done along with dental examination and given CRP test and data was collected within three months

Description of Study Population

The study was non randomized cross sectional observational study and 50 patients with ischemic heart disease were recruited for the study after reading and signing the Informed consent form. This study is interview, examination and diagnostic based study and any kind of drugs were not used on the patients. So there is no risk in this study. By taking part in this study participants will be contributing to research and enlightening on the effects of periodontitis in patients with IHD, which will further help in patient education.

Description of Discontinuation Criteria For Subjects

The participation of patient will be voluntary and he/she will be free to withdraw anytime, without giving any reason, without his/her medical care and rights being affected.

Inclusion and exclusion criteria for subjects Inclusion criteria

- Both the genders
- age >40 years
- atleast 12 scorable teeth
- Radiographic evidence of bone loss
- Tooth mobility
- smokers

Exclusion Critera

a. Pregnancy or lactation.

b. Systemic diseases like diabetes mellitus, immunocompromised patients

c. Systemic antibiotics taken within previous three months.

d. Use of non-steroidal anti-inflammatory drugs.

e. Any surgical periodontal therapy or oral prophylaxis within the last couple of months.

Statistical analysis

Description of Statistical Method Employed

For this study, a Questionnaire is used along with

a blood test for CRP for the collection of data from the recruited patients. It has few questions in it and on the basis of the collected data, the prevalence of periodontitis in the patients can be analyzed.

The data collected will also be analyzed to understand the CRP levels in those patients. Statistical analysis and data interpretation will be done from the collected data using MS EXCEL, pie charts and tables. The number of subjects planned to be enrolled are 50 with Ischemic heart disease.

RESULTS

The diagram below indicates that out of all 50 recruited patients 63% are found to chronic periodontitis and 37% were found to have good periodontal health.



DISCUSSION

Periodontitis is prevalent in majority of patients with IHD. Reason for increased chance of periodontal infection may be due to decreased cardiac output in IHD patients resulting in decreased blood flow to various tissues including periodontium [10]. Periodontitis can be a risk factor in patients with coronary artery disease. Periodontitis was an independent risk factor only in younger patients and men [11]. This may be caused by a decreasing role of periodontitis as a risk factor in increasing age and by differences in health awareness between sexes Periodontitis was associated with cerebral ischemia caused by large-artery atherosclerosis, supporting the hypothesis of a possible link between periodontitis and atherogenesis or complications of atherosclerosis [12, 13]. There was also a strong association with cryptogenic stroke and, to a lesser degree, with cardioembolism. Active periodontal inflammation may contribute to a prothrombotic state via recurrent bacteremia, platelet activation, and elevated clotting factors, thereby increasing the risk of cardioembolism and cryptogenic stroke [14]. Active periodontal inflammation may contribute to a prothrombotic state via recurrent bacteremia, platelet activation, and elevated clotting factors, thereby increasing the risk of cardioembolism and cryptogenic stroke [15]. CRP levels in patients with periodontitis has been found to be greater than patients with good periodontal health.

CONCLUSION

The study shows periodontitis is prevalent in 63% of IHD patients. These patients have a very poor oral hygiene. On examination it was found generalized inflamed gingiva, suppuration, tooth mobility and grade 2 to grade 3 calculus deposition on tooth surfaces. Patients with periodontitis have been found of have higher blood levels of CRP (more than 5mg/dl). CRP is a marker of inflammation. Inflammation can aggravate platelet activation and formation thrombus causing cardiac

embolism which can be a risk factor for IHD patients. Microorganisms from infected periodontium can enter the blood stream and get deposited in atherosclerotic plaque which may cause plaque instability and subsequent rupture and biofilm dispersion.

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