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TO ASSESS THE PREVALENCE AND ASSOCIATION OF PULP STONES WITH HYPERTENSION - A Radiographic study

Mathivadani

Saveetha dental college and hospitals, Saveetha institute of medical and technical sciences , Saveetha university, Chennai , India, Email ID : 151701066.sdc@saveetha.com

Dr. Sangavi .R,

Senior lecturer, Department of oral medicine, Radiology and Special care dentistry, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai 77, Tamil Nadu, India, Email ID: sangavir.sdc@saveetha.com

Dr. **Adimulapu Hima Sandeep**

Associate Professor, Department of conservative and endodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha university, Chennai – 600077, Tamil Nadu, India, Email Id: himas.sdc@saveetha.com

ABSTRACT:

Pulp stones are isolated calcifications that can be seen in the pulp tissue, dentin, or both. Both pathological and physiological causes can cause it. Dental pulp is a highly fibrovascular tissue that is housed in a stiff chamber made up of cementum, dentine, and enamel. This environment provides both strong mechanical support and defense against the microbially active oral environment. Any tooth in the maxilla or mandible, including deciduous, permanent, erupted, and unerupted teeth, can develop pulp stones, which are discrete or embedded masses of calcium that can develop in the coronal and root regions of the pulp organ. They are the unintentional discovery in the typical radiograph, and they don't show any symptoms until they press against a nerve. They are categorized as real pulp stones because of the way that dentin, or odontoblast, forms them.

Keywords : Pulpal stone , hypertension, radiograph , cardiovascular disease,

INTRODUCTION :

Dental pulp contains dense, calcified tissue masses known as "pulp stones." These PS may be located in the pulp's coronal or radicular region. However, coronal PS are more common than radicular PS. PS come in a variety of shapes and sizes; some may be quite minute, while others may be huge enough to obstruct the pulp chamber(1). These PS could be free, embedded, or attached to the pulp space wall. False PS are created from degenerative cells that get calcified, whereas true PS are created by dentine and lined by odontoblast. Both the primary and

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permanent dentitions contain them. Unless they invade any nerve fiber bundles, the PS are typically asymptomatic(2). PS and idiopathic pain can occasionally coexist. During root canal therapy, the adhering and embedded PS presents significant challenges. If present along the root curvature, they result in severe occlusion during the endodontic treatment. Larger PS can significantly alter the internal architecture and clog the canal.

Denticles, also known as pulp stones, are nodular, calcified masses that can develop within the pulp of healthy, damaged, or even developing teeth(2,3). In addition to a plethora of other factors and the unknown, idiopathic ones, numerous theories regarding the etiological factors behind the occurrence of pulp stones have been put forth. These include age, genetic susceptibility, pulpal degeneration, circulatory disturbances in the pulp, inductive interaction between the pulpal tissue and the epithelium, and orthodontic tooth movements(4).

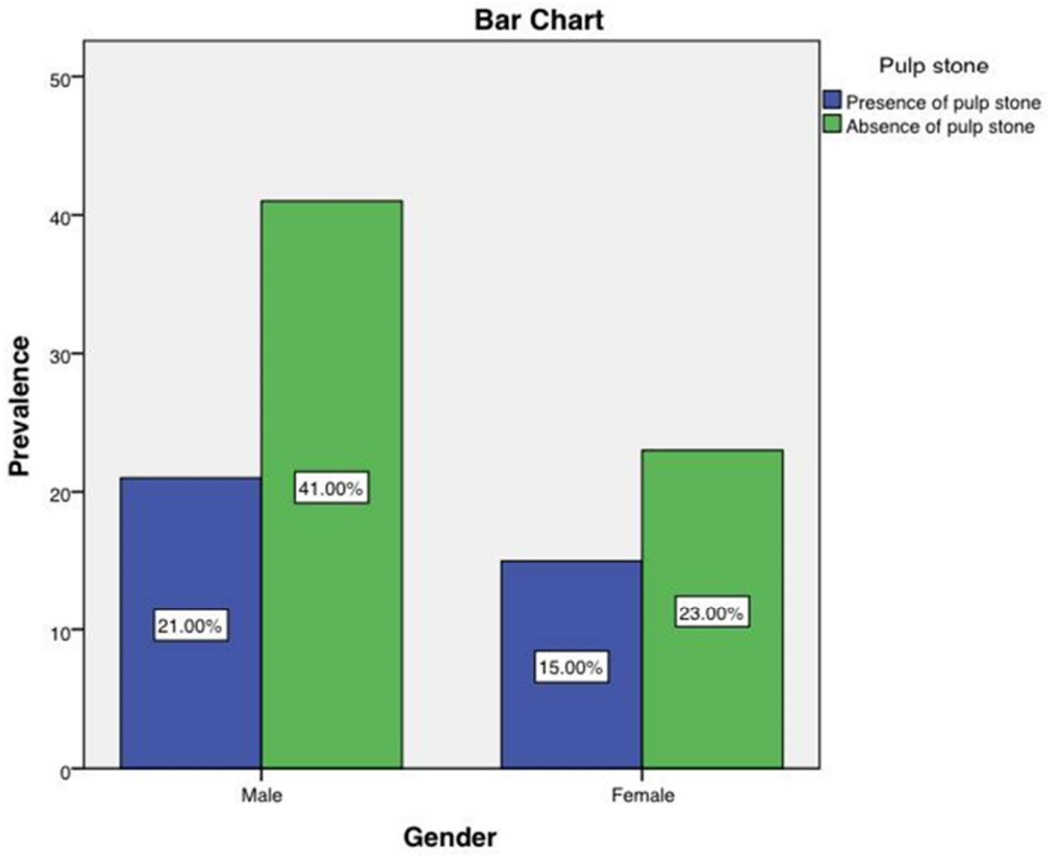
A recent component of atherosclerotic plaque called osteopontin appears to contribute to plaque calcification. Calcifications have also been noted in the renal and carotid arteries, with osteopontin, a protein made by macrophages, playing a major role in the production of calcification centers within the necrotic areas of the various body tissues, including the necrotic areas of tissues affected by breast cancer(5). Given both renal calculi and calcified tissues, including atheromatous plaques found in coronary artery disease are known to create biologic apatite over their cellular coating, it has been hypothesized that pulp stones and these lesions share this characteristic. The pulp chamber or pulp canals of deciduous and permanent teeth frequently include pulp stones, foci of calcification. All tooth types can develop pulp stones, although molars are known to be affected the most frequently. The pulp chamber may contain free-floating pulp stones or pulp stones that are connected to the dentinal wall. Depending on where they reside, pulp stones can be categorized as embedded, adhering, or free types(6). Histologically, they can also be divided into "true" and "false" types. The tubular structure of true pulp stones is known to be lined by odontoblasts and to resemble the dentin. Therefore, it is assumed that epithelial-mesenchymal interactions lead to the development of genuine pulp stones. False pulp stones are created from degenerating pulp cell debris that later mineral sizes. Concentric layers of surface-accreted mineralized tissue make up these layers(7). Due to its high incidence and links to chronic renal disease and cardiovascular disease, hypertension is a significant worldwide health issue. 1–3 The leading worldwide preventable risk factor for early mortality and disability is hypertension. In patients with end-stage renal illness, vascular calcifications are reliable indicators of all-cause and cardiovascular death. Atheroma plaques in the carotid bifurcation frequently lead to cerebral vascular events (80% of cases)(8). Friedlander and Lande were the first to describe the presence of carotid artery calcifications on a panoramic radiography as a potent predictor of future vascular events of cardiovascular and cerebrovascular.

MATERIALS AND METHODS:

The present study was conducted on 100 outpatients with the age between 40-80 of saveetha dental college who diagnosed cases of hypertension of both genders. All were informed regarding the study and written consent was obtained. Before the study, ethical approval was acquired. General data was logged, including name, age, gender, etc. The study comprised patients with systemic blood pressure greater than 170 mm Hg and diastolic blood pressure greater than 110 mm Hg. Each person had their maxillary and mandibular arches radiographed (OPG). The possibility of tooth calcification was taken into account. Likewise obtained results were statistically examined using the chi-square test. P value under 0.05 was regarded as significant.

RESULT:

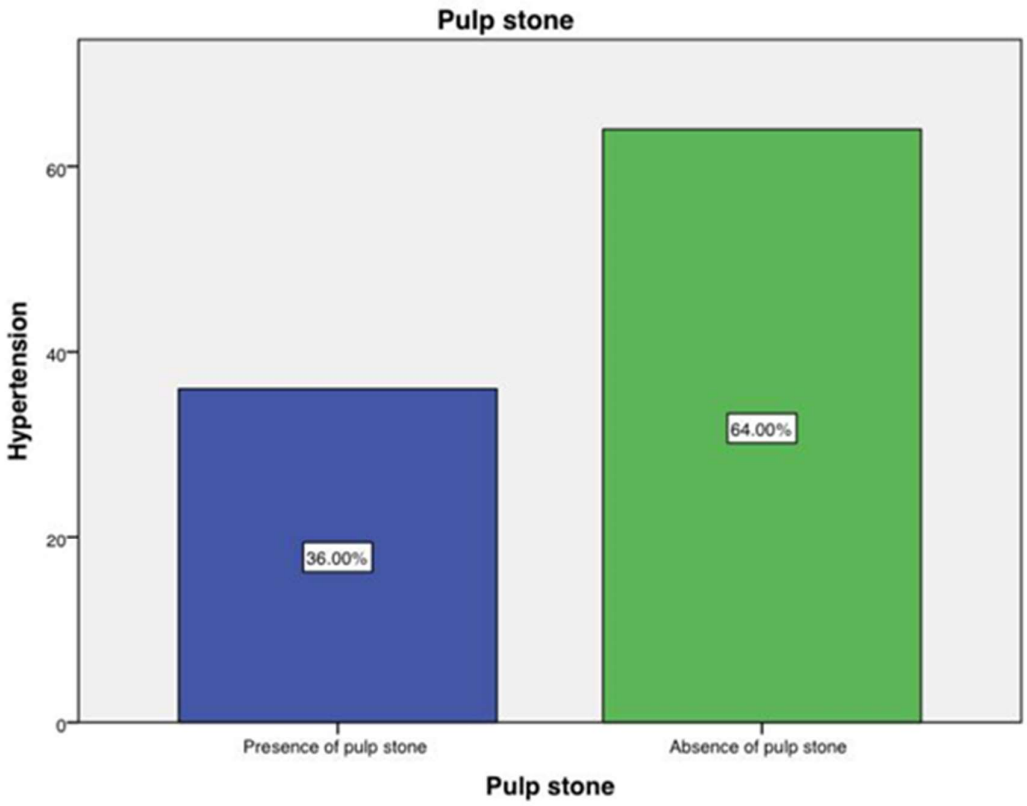
TABLE 1:



The above bar chart shows that gender of the patient with hypertension ,

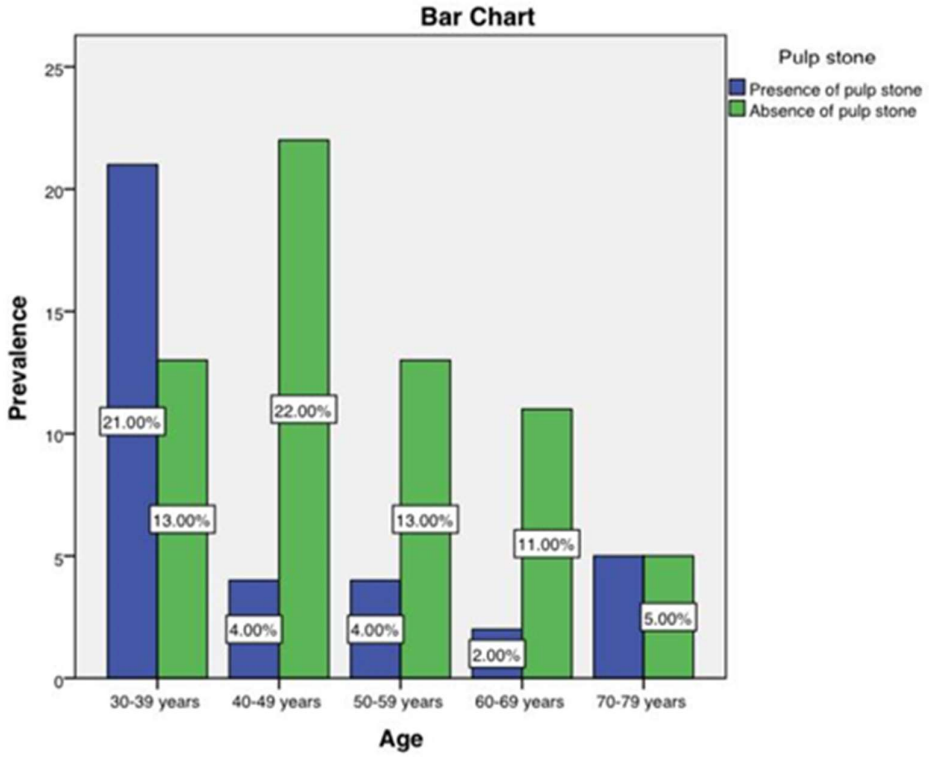
Male with presence of pulp stone is 21%, absence of pulp stone 41% and female with presence of pulp stone is 15% , absence of pulp stone is 23%.

TABLE 2:



The above bar chart shows that the patient with hypertension who has presence of pulp stone is 36% and absence of pulp stone is 64%.

TABLE 3:



The above bar chart shows that age of the patient with hypertension ,

Age 30-39 years Presence of pulp stone 21% , absence of pulp stone 13% , age 40-49 years presence of pulp stone 4%, absence of pulp stone 22% , age 50-59 years presence of pulp stone 4% , absence of pulp stone 13% , age 60-69 years presence of pulp stone 2% , absence of pulp stone 11% , age 70-79 years presence of pulp stone absence of pulp stone 5% .

DISCUSSION:

Pulp stone formation is still somewhat mysterious. According to studies, pulp stone development and a high frequency of cell islands, thought to be of epithelial origin, were seen in teeth that had undergone experimental intrusion. The pathogenic impact of vascular wall injury brought on by stimulation of the pulpal tissue by dental caries germs can lead to calcium salt buildup within the tissue(9). The prevalence of pulp stones was higher in men than in women, in the mandible (51.4%) than in the maxilla (48.6%), on the left side compared to the right, in molars as opposed to premolars, and in the first molar as opposed to the second molar.

Since atherosclerosis rarely exhibits any signs or symptoms and poses a serious risk to life, early identification is crucial. The prevalence of pulpal calcification is higher in people with coronary atherosclerosis(10). When compared to people with other systemic disorders, CVD

patients had the most pulp stones. According to Edds et alresearch, only 39% of patients without a history of CVD developed pulp stones, compared to 74% of individuals with a history of CVD(6).

In clinical dentistry, PRs are a common imaging modality that can reveal information about nearby soft tissues, bones, and vascular diseases. In the C3-C4 intervertebral region, between the hyoid bone and 1.5 -- 2.5 cm from the inferior posterior mandibular angle, CAC is frequently seen as irregular, nodular, circular heterogeneous opacities(5). The pulp chamber is destroyed by pulp stones, making access difficult during root canal therapy. 1 One of the frequent signs of pulp stones is palpebral discomfort. From little to severe pain is possible. They may result in root canal obstruction, which results in endodontic failure. Routine dental radiographs may be helpful as a quick diagnostic tool for calcified atheromas and calcification dental pulp since they may have a similar etiology(11).

The goal of the current study was to evaluate how the study population's hypertension and pulp stones related. Using radiographic criteria, Moss-Salentijn and Klyvert analyzed the pulp stones. Furthermore, Goga R noted that because pulp stones with a diameter less than 200 m cannot be observed on radiographs, their histological presence is significantly more common.Suitable literature search came up empty(12).

Additionally, the current study, whose P = 0.001 is consistent with Jose George et al., documents the relationship between hyperlipidemia and the occurrence of pulp stone. Lipids are known to be involved in early bone mineralization at the level of nidus development and are known to affect both bone formation and bone resorption(13). The production of matrix vesicles, which serve as nucleation sites, is a necessary step in the development of hydroxyapatite crystals in bone. Phospholipids, phosphoproteins, and alkaline phosphatase are components of matrix vesicles, which are hypothesized to have a role in the beginning of hydroxyapatite mineral production. Through bettering osteogenic differentiation, modified lipoproteins promote calcification(14).(15) (16) (17–26)

CONCLUSION:

It has been proposed that routine dental radiography may be utilized as a screening tool for people who are at high risk of developing cardiovascular disorders.

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