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Original Research Paper

Endodontics

PREVALENCE OF CORONAL PULP STONES IN RELATION TO BRUXISM AND RENAL STONES: A SURVEY IN GUJARAT STATE POPULATION.

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ABSTRACT

Introduction: Calcifications can occur in the dental pulp as discrete bodies known as pulp stones. Etiology remains obscure. Calcification is a great enigma to an endodontist. A local or systemic condition may give a premonition of such a condition. Also this has been seen to vary according to the different demographic locations. Thus the purpose of my study is to investigate the prevalence of coronal pulp stones in relation to Bruxism and Renal Stones in Gujarat state population. **Methodology:** Patients with Bruxism and Renal Stones were involved in the study. RVG of all first molars of each patient were recorded to check for the coronal pulp stones. The Data obtained was subjected to statistical analysis using SPSS Software. **Result:** Co-relation exists between prevalence of coronal pulp stones in patients with Bruxism and Renal Stones. **Conclusion:** Thus, it can be concluded that patients with bruxism and patients with renal stones, do have a correlation with the prevalence of coronal pulp stones, in Gujarat state population.

KEYWORDS :

INTRODUCTION

Pulp stones are nodular, calcified masses appearing in the coronal and/or root portions of the tooth. They often develop in teeth that may appear normal. They can be in functional as well as embedded teeth, usually being asymptomatic unless they cause any pressure on the nerves or blood vessels. Despite a number of microscopic and histochemical investigations, the exact etiology of pulp calcifications remains unknown. (1) Studies, using radiographic examination, related to the prevalence of pulp stones, have been reported with various percentages [ranging from 8% to 95%]. These calcifications pose endodontic problem of hindering access to root canals and their shaping (3). Pulp stones are also seen in patients with systemic or genetic disease such as dentin dysplasia, dentinogenesis imperfecta and Vander Woude syndrome. Hypercalcemia, gout and renal lithiasis are also considered as pre-disposing factors to pulpal calcification. (2) These conditions are noted secondary to the calcium metabolism. (4) The stressed pulp condition should be considered prior to any extensive restorative dental procedures. Although it is usually asymptomatic clinically, it may deteriorate to a pathologic or necrotic condition. The following conditions may cause pulpal injury and may lead to pulpal stress, like, chronic bruxism, chronic caries, chronic periodontal disease, chronic trauma from occlusion, chronic occlusal attrition and erosion cracks in tooth structure, radiation therapy, systemic diseases, oral manifestation diabetes, vitamin C deficiency, leukemia, endocrine disturbances (5). Establishing a correlation between such local conditions (Bruxism) and systemic condition (Renal Stone) with prevalence of coronal pulp stones, might help in early detection of a deleterious habit or systemic conditions. Also, such survey has not been conducted for Gujarat state population, thus the aim of this survey is to find the prevalence of correlation between the local factor like bruxism or systemic condition like renal stones and presence of coronal pulp stones.

METHODOLOGY

A total of 100 patients (50 of each condition), were included in the survey. Patients belonged to different cities of Gujarat State within the age group of 20-70 years. Patients were selected based on the criteria mentioned below.

Inclusion Criteria:
Patients with:
Bruxism
Renal Stone
Exclusion Criteria:
Carious teeth involving pulp
Restored Teeth
Teeth with prosthesis
Pregnancy
Radiotherapy
Patient with systemic conditions other than the one being investigated.

For the patients with Bruxism, a thorough oral check-up was done. All the clinical signs, patient's bite along-with any other complaint of muscle pain or headache was evaluated to categorise the patient with the habit of bruxism. Deep occlusal facets or wearing off of the tooth surface were checked and muscle palpation was done. A written consent from the patient was recorded.

For the patients with renal stones, a thorough was taken and physician's opinion was resorted. Those patients who were on medication though with no symptoms of any pain, were included in the survey, along with those who have had been on medication or any interventional procedure for renal stones in past less than a month.

All the participants were informed about the procedure and following their written consent, they were included for the study. Necessary precautions, like lead apron and thyroid collar were taken before subjecting the patients to the x-ray.

Portable X-ray unit and RVG machine were used to minimize patient discomfort and radiation. Once patients were selected for the survey, a Radio Visuo-Graph (RVG) of Maxillary and Mandibular; Right and Left Molars of each patient was recorded. The radiographs were observed for the presence or absence of coronal pulp stones. The RVG recorded were documented digitally, analysed and noted under observation.

The Data obtained is as follows in Table 1

Table 1: Data Showing The Prevalence Of Coronal Pulp Stones In Patients With Bruxism and Renal Stones

Prevalence of Coronal Pulp Stones in Patients with Bruxism and Renal Stones		
	Bruxism	Renal Stones
Pulp Stone Present in Total No. of teeth	174	132

Pulp Stone Absent in Total No. of teeth	26	68
Total No. Of teeth	200	200
Percentage	87%	66%

This Data was subjected to statistical analysis with Chi Square Test using SPSS Software and following result was obtained, as shown in Table 2

Table 2: Comparison Of Prevalence Of Coronal Pulp Stones In Patients With Bruxism and Renal Stones

Comparison of prevalence of Coronal Pulp Stones in Patients with Bruxism and Renal Stones		
	Bruxism	Renal Stones
Pulp Stone Present in Total No. of teeth	174	132
Pulp Stone Absent in Total No. of teeth	26	68
Total No. Of teeth	200	200
Chi Square with Yates correction	24.53	
df	1	
Chi Square P value at significance level 0.05	3.84	

DISCUSSION

In this survey, 100 patients were included and all first molars of these patients, so a total of 400 molars were examined. Further, the patients selected were divided as 50 patients with Bruxism and 50 Renal Stones.

As, can be seen from the data obtained in the observation table, amongst the 200 molars observed, in the 50 patients with Bruxism, 174 molars exhibited pulp stones in the coronal part of the tooth. This suggests that in patients with bruxism, there is 87% prevalence rate for the presence of coronal pulp stones. The causative factors and mechanism of the formation of pulp stones remain quite unknown, though some factors are considered to stimulate pulpal calcifications, as long standing carious lesions, restorations and continuous force application as in orthodontic treatment. (6) This can be correlated with the forces being exerted on the dentition in patients with bruxism. Orthodontic tooth movement affects dental pulp similar to surgical or chemical stimulation. Studies have shown that the orthodontic force application may cause pulpal changes like altered pulpal respiration rate, pulpal obliteration by secondary dentin formation, internal root resorption, cystic changes, pulpal necrosis and even calcification of pulp.(6) According to Abou-Rass, pulp chambers of stressed pulps may have receded in size or may indicate presence of pulp stones.(5) Stressed pulp may be seen in patients with, Chronic trauma from occlusion, Chronic occlusal attrition and erosion and Cracks in tooth structure. (5) Ranjitkar *et al* has that suggested long standing chronic irritation to pulp might lead to formation of pulp stone formation and, since bruxism is a longstanding chronic irritation to dentition, it contributes to stimulation of pulp stones(3), in turn justifying the data obtained in the present study.. All these mentioned conditions are a common findings in patients with bruxism. This suffices the justification of our data obtained, which suggests 87% of prevalence of coronal pulp stones in patients with bruxism.

Now, moving on to the discussion about the data obtained in patients with renal stones. Amongst, the 200 molars observed for 50 patients with renal stones, a total of 132 molars showed the presence of coronal pulp stones. This suggests a prevalence rate of 66% for the presence of coronal pulp stones in patients with renal stones. Movahhedian et al. investigated that there exists a strong correlation between the number of teeth with pulp stones and kidney stone, suggesting the following ratio, that if there are calcified particles in three teeth or more, it is 5.78 times more probable to detect kidney stones, too. (7) Näsström *et al*. has also reported a positive relation with respect to this. (7) Calcifying nanoparticles (CNPs) have led to a major controversy in modern microbiology. CNPs were initially detected in human renal stones. Subsequently, an animal model of CNPs-induced renal stones was established successfully. Since then, the role and importance of CNPs had extended substantially beyond renal stones. Now, they are suspected to be implicated in various pathological calcifications in the human body. (8) According to the findings of the study carried out by Zeng et al, there is prevalence of CNPs in human dental pulp stones, which has raised the probability that CNPs might be implicated in the formation or development of dental pulp stones. (8) Thus, connecting the available data and explanation, it justifies the prevalence of coronal pulp stones in patients with renal stones, as evident from this study.

In the present study, only the first molars were considered, as the first molar being the first posterior permanent tooth to erupt and contains more pulp stones than others. Also, the prevalence of pulp stones in the molars might be due to earlier eruption and thus exposing them to more possible degenerative changes. (9) Similar observations, were obtained in a study carried out by Patil et al (2018), which suggested that molars and that too the first molars showed higher prevalence of pulp stones. (10) A survey, amongst Turkish population carried out by Turkal, et al in 2013 showed that the first molars showed higher prevalence of pulp stones. (11). Thus considering these, only first molars were included in our survey.

Thus, summarizing the data obtained from this survey, it can be said that presence of coronal pulp stones in first molars, may serve as a marker for early diagnosis of conditions like Renal Stones and Bruxism.

CONCLUSION

Thus, within the limitations of the study, it can be concluded that, there does exist a correlation between the prevalence of coronal pulp stones in patients with bruxism and in patients with renal stones, in Gujarat state population.

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