The Chronic Renal Failure and Carotid Vascular Valcification, Dental Pulp Calcification and the Relationship of Dental Pulp Cavities

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Abstract: The main purpose of the present study is to investigate and determine the relationship of the chronic renal failure due to the hemodialysis patients and healthy individuals’ dental panoramic radiographs regarding to the carotid artery calcification and periapical radiography in relation to the dental pulp artery calcification and pulp stones being presence between two hemodialysis patients and healthy groups. This study is subjected to the chronic renal failure patients undergoing hemodialysis (57 patients) without any systemic disease in control group and 58 experimental group totaling 115 individuals participated in this study. In panoramic radiography, the carotid artery calcification, periapical radiography artery calcifications were carried out to analyze the dental pulp cavities and the existence of stones. The carotid artery calcification was observed in the control group but none of the cases of hemodialysis was seen except in three ones of 57 patients (5026%). Pulp calcification was seen in 16 dialysis patients (28.07%) starting in 108 teeth (10.24%) in the control group of seven individuals (12.6%) being started in 19 teeth (1.45%) potentially in this regard. The movement of the pulp was seen 17.5% in five teeth (38%) in control group and only a one case was observed in dialysis patients (1.75%) in the first tooth (0.09%) in this pavement. The chronic renal failure was observed between dialysis patients with results of healthy individuals with panoramic and periapical in the comparative studies; of course there have been observed differences between the carotid artery calcification and dental pulp stones. There was also observed significant difference between the calcification and the pulp statistically.

Keywords: Hemodialysis, Pulp Calcification, Carotid artery Calcification.

Introduction

The kidneys of the human body is subjected to the adjustment of fluid-electrolyte and acid-base balance, toxic substances and many other drugs exertion as well as active vitamin D production by providing the bone metabolism regulatory effect as the most essential functions of the kidneys. Phosphate retention of the chronic renal failure and loss of calcium in the kidneys is happened due to the result of this secondary hypocalcaemia causing to the skeletal hiperparatriodiz changes in this regard. In these patients, there have been found considerable Results in relation to their jaw and dental skeleton; these include periodontal diseases, parotid glands enlargement, bad odor and taste in the mouth, waterless of the mouth, lichenplanus, malignancies, viral and fungal infections (candida), pulp calcification, carotid artery calcification, loss of lamina stability, loss of cortical bone and Brown tumors.

The main purpose of the present study is to investigate the chronic renal failure due to the hemodialysis disease and panoramic radiography of dental pulp calcification among healthy group and to evaluate the relationship between the dental pulps among both groups.
Materials and Methods

About 57 hemodialysis were investigated in nephrology section in relation to the dental pulp ranging between 41.63± 17.194 years old and 58 patients were also considered as the control group ranging between 36.34± 12.708 years old that totally 115 people were participated in this study. This was also confirmed by the moral committee in this regard. Every participant was become under the digital panoramic, pulp calcification and dental pulp tests in order to find the existence of the dental pulp digital radiograph peripacal test, too. In this test the unfavorable radiographs were eliminated from the study. In a dark radiography room, the negatoscop was achieved based on two lenses under maxillary radiology twice a week for 15 days. There is no observed significant difference statistically in this study. Of 2653 destroyed and dental caries, the restoration showed 294 dental caries out of 2359 teeth including dental pulp, pulp calcification. In the radio opaque room the existences of the dental pulp (diagram 1) and the existence or lack of dental calcification scores were investigated in this study. The pulp calcification and the channels of the pulp and or the whole section of the same pulp enclosure were also evaluated in this pavement (Diagram 2). The panoramic radiography was achieved on the cervical vetebrate of lateral cervical 4 (C4) and cervical 3 (C3) and under the retro molar area of hyoid bone between the distance of angulus mandible calcified structure of carotid artery calcification (figure 3). X2 test was performed in order to illustrate the relationship between two categorical variables.

Results

In this study, about 115 individuals (57 patients and 58 control group) received panoramic and peripical dental radiography being evaluated on 2359 teeth in this pavement. 35 individuals of hemodialysis patients were female (61.40%) and 22 ones were male (38.60%). In the control group, from 58 individuals about 35 people (60.34%) were female and about 23 ones were male (39.66%) in the related study. The age of patients was ranging from 17-77 years old (41.63%); in the control group, the age was ranging from 16-63 years old (36.34%). There is seen carotid artery calcification among 3 hemodialysis patients (5.26%) but there is no found this carotid artery calcification in control group (0.00%) (Table 1). There is no also found statistical difference in this case.

In control group, three subjects (5.17%) showed totally 5 teeth the related pulp calcification (1.45%); in hemodialysis patients a one subject (1.75%) only showed 1 (0.09%) the pulp calcification in the same tooth. (Table 2). There is no found statistical difference in this regard. Pulp calcification:
In control group, 7 out of 58 teeth (12.06%) and 19 cases out of 1305 teeth the pulp calcification was observed; in hemodialysis patients (57 people) about 16 ones (28.07%) and 108 cases out of 1054 teeth (10.24%) the pulp calcification was also seen (Table 2). There is also statistical difference found in this case (P<0.001).

![Figure 1. Pulp stones (dental pulp)](image_url)
Figure 2. Pulp calcification.

Figure 3. Carotid artery calcification.

Table 1. Number of patients with carotid artery calcification and dental pulp.

<table>
<thead>
<tr>
<th></th>
<th>Number of patients</th>
<th>Carotid artery calcification</th>
<th>Dental pulp calcification</th>
<th>Dental pulp stones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemodialysis patients</td>
<td>57</td>
<td>3 (5.26%)</td>
<td>16 (28.07%)</td>
<td>1 (1.75%)</td>
</tr>
<tr>
<td>Control group</td>
<td>58</td>
<td>0 (0.00%)</td>
<td>7 (12.06%)</td>
<td>3 (5.17%)</td>
</tr>
<tr>
<td>Total</td>
<td>115</td>
<td>3 (2.60%)</td>
<td>23 (20%)</td>
<td>4 (3.47%)</td>
</tr>
</tbody>
</table>
Table 2. Number of teeth regarding to dental pulp calcification.

<table>
<thead>
<tr>
<th></th>
<th>Number of patients</th>
<th>Dental pulp calcification</th>
<th>Dental pulp stones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemodialysis patients</td>
<td>1054</td>
<td>108 (10.24%)</td>
<td>1 (0.09%)</td>
</tr>
<tr>
<td>Control group</td>
<td>1305</td>
<td>19 (1.45%)</td>
<td>5 (0.38%)</td>
</tr>
<tr>
<td>Total</td>
<td>2359</td>
<td>127 (4.96%)</td>
<td>6 (0.25%)</td>
</tr>
</tbody>
</table>

Discussion and Conclusion

In patients with chronic renal failure which are characteristics of arterial disease called atherosclerosis seen the calcification of the middle layer and thickening can be found in these subjects. This also increased the calcification of vascular damage seen in patients’ activators and inhibitors of the calcification process resulting from the decreased metastatic secondary calcification in this pavement. The carotid artery calcifications could be considered as the most crucial symptoms on panoramic radiography and a risk factor for vascular disease. Hence, the carotid artery calcifications on panoramic radiography of the entire patients seen for evaluating and treating the vascular disease are recommended in this regard. The carotid artery calcification on panoramic radiography was found firstly by Friedlander and Land. It is stated that these radiographs play key role in the early diagnosis of carotid artery calcification. Many studies were expressed in the determination of the atheroma’s having high diagnostic value of panoramic radiographs. The electron beam computed the tomography (Electron Beam CT) in a study detected healthy subjects undergoing hemodialysis adult patients with artery calcification. About 112 dialysis patients were conducted in a study undergoing the panoramic radiography in relation to diagnosis the carotid artery calcification that there was no found the related disease in this regard. Kansu et al carried out a study on 29 dialysis patients showed 6 subjects with the same disease and they transplanted 5 patients out of 31 subjects to diagnosis the carotid artery calcification. Ohba T et al in a study carried out on healthy subjects showed that about 5% of individuals showed the carotid artery calcification by achieving panoramic radiography ranging between 5.04% of these people. Garay et al carried out an evaluation on healthy group and they indicated that the angulus in panoramic radiography seen in the mandible of the same groups investigating their soft tissue calcification that about 2.69% of the same carotid artery calcification was found in this case. In our study regarding to dialysis patients the patients (5.26%) showed carotid artery calcification while the same case was seen in control group potentially. The tests of both groups did not show significant difference statistically. Our Results were performed in dialysis patients as well; Kansu et al showed the Results in Patil S; Garay et al and their Results are not coincident with other ones here. The difference between studies may be due to the differences between the ages of the related groups. The pulp calcification of both healthy and diseased groups could be seen in the pulp of un-erupted teeth being calcified into the related masses. The process of pulp calcification is fully understood in the formation of the mentioned reasons despite the age, gender, various systemic diseases and long term irritation as responsible case for the same process. Clinically the process of pulp calcification is not available. They are existed in the pulp chamber and root canals being observed by the radio-opaque structure. The process of radiography is the only non-invasive tool in clinical trials for the evaluation of pulp calcification. Some calcification cannot be seen in radiography due to their indistinguishable sizes in this regard. Periapical and bitewing radiographs and calcification in the pulp can be easily assessed. There were found statistical differences between two related studies. Therefore, periapical radiographs were applied in our study potentially. The chronic renal failure in patients with narrowing of the pulp chamber was found. In another study, about 74.99% of patients with chronic renal failure were observed having the pulp calcification. Again Kansu et al showed 22 out of 29 dialysis patients about 75.90% the pulp calcification. Patient and control groups, 57 dialysis patients only showed 16 (25.07%) pulp calcification. In control groups with 58 subjects only 7 subjects (12.06%) indicated the existence of pulp calcification. The statistical tests performed in terms of the calcification of the pulp had a significant difference statistically in this regard. our results are consistent
with earlier studies here. Pulp teeth was seen that it is free or adherent from microscopic particles large enough to completely filled in the pulp tissue being prevalence in the general population ranging from 8-90% in this field.

For the formation of the pulp teeth regarding to chronic irritations, orthodontic tooth movement was observed in the pulp tissue and epithelial region. However the etiological of the same process is not fully understood in this case. In dialysis patients with chronic renal failure, the formation of the dental pulp was seen in 5 out of 14 dialysis patients. In another study regarding to 112 patients about 5 patients had the dental pulp calcification. Chandler et al in a study carried out on healthy young adults showed about 10% out of 121 individuals and 445 teeth were detected subjects that only 4% was subjected to the pulp movement. Sisman Y et al showed in Turkish population that about 6926 teeth only showed 15% the dental pulp in this pavement. Nayak M et al showed in their study that the systemic disease and comparative studies of the control groups, there is only showed 4.76% were female (882 subjects) having dental pulp calcification. In our study 1 out of 57 patients indicated the movement of the teeth pulp. But in three individuals of the control group, it is shown only in five teeth moving the pulp in this field. Our results are partly coincident with the studies being carried out on healthy groups. However, the study was not compatible with here. This difference may be due to the criteria selected for the evaluation and examination of the teeth number.

References


