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Radiographic study on relation of the periapical status and frequency of endodontic treatment of teeth with and without apical periodontitis in an Iraqi population .

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Abstract

Aim: The point of the study was to assess the prevalence of apical periodontitis and frequency of endodontic treatment in an Iraqi population.

Materials and methods: Panoramic radiographs of 300 Iraqi subjects 18-60 years old. The periapical status of all teeth (with the exception of third molars) was examined using periapical index scoring system (PAI). Information were investigated statistically using the Chi-squared test at the significance level of $p<0.05$.

Results: Out of 5822 examined teeth belonging to 300 patients 156 had one or more teeth with apical periodontitis (PAI 3-5) and 253 individuals had one or more endodontically treated teeth.

Conclusions: The discoveries of the exhibit examination come into concurred upon with different investigations which accentuate that a worldwide improvement in the quality of root canal treatment in general dental practice is required to promote periradicular health.

Keywords: Apical periodontitis , endodontic , teeth ,panoramic .

Introduction

The pulp and the periodontium are in intimate relationship from the beginning of the development. As development progresses there's a direct vascular communication between the pulp and the periodontium through the apical foramen and accessory canals [(1)] . Apical periodontitis is an acute or chronic inflammation process around apex of the tooth. This inflammation is frequently asymptomatic and distinguished primarily on routine radiographic examination. Early-stage apical pathology may be indicated by radiographically noticeable changes in the lamina dura [(2)] .The main reason of apical periodontitis is bacterial invasion and colonization of the root canal infiltrating into the periapical tissues. Apical periodontitis usually develops following necrosis of the pulp [(3)] also is frequently detected in connection with endodontically treated teeth [(4,5,6)] . The prognosis for teeth with apical periodontitis to heal completely after conventional root

canal treatment is 73-86% [7,8] . The diagnostic outcome of root canal treatment may be dependent upon clinical and radiological findings [9,10] . It is not uncommon for disease to be clinically asymptomatic [11,12,13] ; therefore, radiological evaluation is important to objectively determine the outcome of treatment [14] . The point of the study was to assess the prevalence of apical periodontitis and frequency of endodontic treatment in an Iraqi population.

Materials and Methods

The study sample was collected from the College of Dentistry of Al Mustansiria University and comprised of orthopantomographs (OPGs) of 300 Iraqi subjects 18-60 years old (100 males and 200 females, in five age groups of 10 year intervals, within 60 individuals per group .Each subject needed an OPG made throughout those examination. Individuals younger than 15 years and those with 7 or less remaining teeth were excluded from the study participation . Constantly on OPGs were obtained using digital devices (My ray CE 0051(V.B1 cocc A 14/C-IMOLA (BO)-Italy, X-ray source (75 kVp, 8 mA) , exposure time (9.42 sec) . Missing and root filled teeth were recorded from the panoramic survey. The periapical status of all teeth (with the exception of third molars) was examined using periapical index scoring system (PAI), suggested by Ørstavik et al. [15] (Figure 1) [16] . PAI is based on the use of reference radiographs with verified histological diagnosis and is composed of five categories as follows:

1) Normal periapical structures or normal apical periodontium,
2) Small changes in periapical bone structure or bone structural changes indicating, but not pathognomonic for apical periodontitis,
3) Changes in periapical bone structure with some mineral loss or bone structural changes with some mineral loss characteristic of apical periodontitis,
4) Demineralization of periapical bone with well defined radiolucent area or well-defined radiolucency,
5) Demineralization of periapical bone with exacerbating features or radiolucency with radiating expansions of bone structural changes.

Scores 1 alternately 2 indicated healthy teeth where as scores 3 to 5 indicated the presence of AP. For multi rooted teeth, the root with the highest PAI score was recorded.

Teeth were categorized as endodontically treated if they had been obturated with a radio-opaque material in the pulp chamber and/or in one or more of the root canals The statistical analyses were assessed by chi-square test and the significance level was $p<0.05$.

Results

The study sample comprised 5822 teeth belonging 300 patients (100 males and 200 females). A range: 8-28 teeth were analyzed for every subject. Age range of the subjects was 18 to 60 years. Out of 5822 examined teeth, the frequency of AP and RFT was 2.6% and 4.3%, respectively. Of the 5822 teeth examined, 4.3% had been root-filled, and of these 27.6% exhibited an AP (PAI>2) . Gender had effect on the presence of AP or the frequency of endodontic treatment and it was significant (Chi-square=2.032 p=0.048 P<0.05 Significant) . The frequency of AP and endodontic treatment increased with age and they are significant when different age groups are compared (Chi-square=6.198 p=0.003 P<0.05 Significant ; Chi-square=4.905 p=0.027 P<0.05 Significant ,

respectively) . The age and gender distributions of examined teeth stratified by the apical status and endodontic treatment are shown in Tables 1; 2 and 3 ; AP recorded basically On score 3 and it was significant when compared with scores 4 and 5 (Chi-square=7.265 p=0.026 P<0.05 Significant) ;Table 4 and Figure 5 are spoken to that. Overall, 4.3% of the RFT , the lower first molar had most effected teeth in both gender ; Tables 5 , 6 and Figures 6 , 7 are cleared that.

Discussion

Periapical periodontitis represents a diminishment in the mineral density of the affected periapical bone in response to a localized inflammatory reaction to residual and/or re-infection within the root canal system [17,18] ; radiographically, this displays as a radiolucency. Conversely, the nonattendance of a periapical radiolucency at the periapex of the root canal-treated roots demonstrates the absence of periapical periodontitis, suggesting that root canal treatment has been successful [19,20] . A number of researchers have used panoramic radiographs for periapical evaluation[7,21,22]. The PAI was first described for periapical radiographs [23,24,25] , However various epidemiologic studies have used this index for panoramic radiographs or for both techniques at the same time too [24] . In this study , the frequencies of apical periodontitis and endodontic treatment was 2.6% and 4.3%, respectively. Taşsöker and Akgünlü [16] found that the frequencies of apical periodontitis and endodontic treatment was 1.8% and 3.7%, respectively during a study sample comprised 6196 teeth belonging to 250 patients which in close proximity with the results of this study . The present study was in a line with the studies from Denmark only 1.8% [6] , from Portugal 2.0% [26] and from patients aged 35 to 44 years attending a university dental clinic in Ireland, 2.2% of all evaluated teeth was found with apical periodontitis [27] . Other two investigations bring indicated higher figures, Kabak and Abbott [21] 12% and Sidaravicius et al. [28] 7.2%. The information introduced in regarding prevalence of apical periodontitis demonstrates that this state is most prevalent in Eastern European countries [26] . On the other hand, the frequency of RFT we observed in this study was 4.3% and this was within the findings reported (2.0% - 21%) in previous studies [29,30, 31,32] . The frequency of AP in RFT was (27.6%), this result comes in agreement within the range reported by several previous studies (25% - 64.5%) [31,33,34] . In other study , the frequency of AP in RFT was lower (15.5%) than that of the present study , this difference might be identified with the frequent extraction of teeth with periapical disease and even with pulpitis in this population [16] .The RFT frequency found in this study (4.3%) was in close with Kirkevang et al. [6] and Peters et al. [32] 4.8% . According to study findings, the frequencies of AP and endodontic treatment increased with age, which is in accordance with some researchers [2,6] and it showed statistical significance among different age groups .This increase may be that the younger people tend to visit the dentist more frequently when contrasted with elderly and thus they have a lower incidence of caries and periodontal diseases [35] . The results of the present study demonstrated that gender had effect on frequency of RFT or AP which in a consistent with other studies, gender was reported to have an effect on the number of RFT related to female predominance [36,37] . The present study is in conformity with the

opinion of the authors [36,37] claimed that this result may indicate the greater interest of female patients to have dental care and their regular attendance for check-ups .The findings of the present investigation come into agreement with other studies which emphasize that a worldwide improvement in the quality of root canal treatment in general dental practice is required to promote periradicular health.

Conclusions

The discoveries of the exhibit examination come into concurred upon with different investigations which accentuate that a worldwide improvement in the quality of root canal treatment in general dental practice is required to promote periradicular health. This study provides epidemiological data about apical periodontitis and endodontic treatment in an Iraqi population .

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Figure (1) [16] :Visual references used for the evaluation of the roots using the Periapical Index (PAI) score system as proposed by Ørstavik et al. [15] .

Table (1) : The age distribution of examined teeth according to endodontic treatment and these teeth with AP.

age groups	number of teeth	Number of endodontic	With AP
≥ 20	1200	30 (11.9%)	2(2.9%)
21-30	1300	45 (17.8%)	8(11.4%)
31-40	1512	55 (21.7%)	15(21.4%)
41-50	1010	60 (23.7%)	17(24.3%)
50-60	800	63 (24.9%)	28(40%)
total	5822	253 (4.3%)	70(27.6%)

Chi-square=4.905 p=0.027 P<0.05 Significant
The Hypothesis between variables and the significant difference , H1 =0.973 P<0.05 Significant

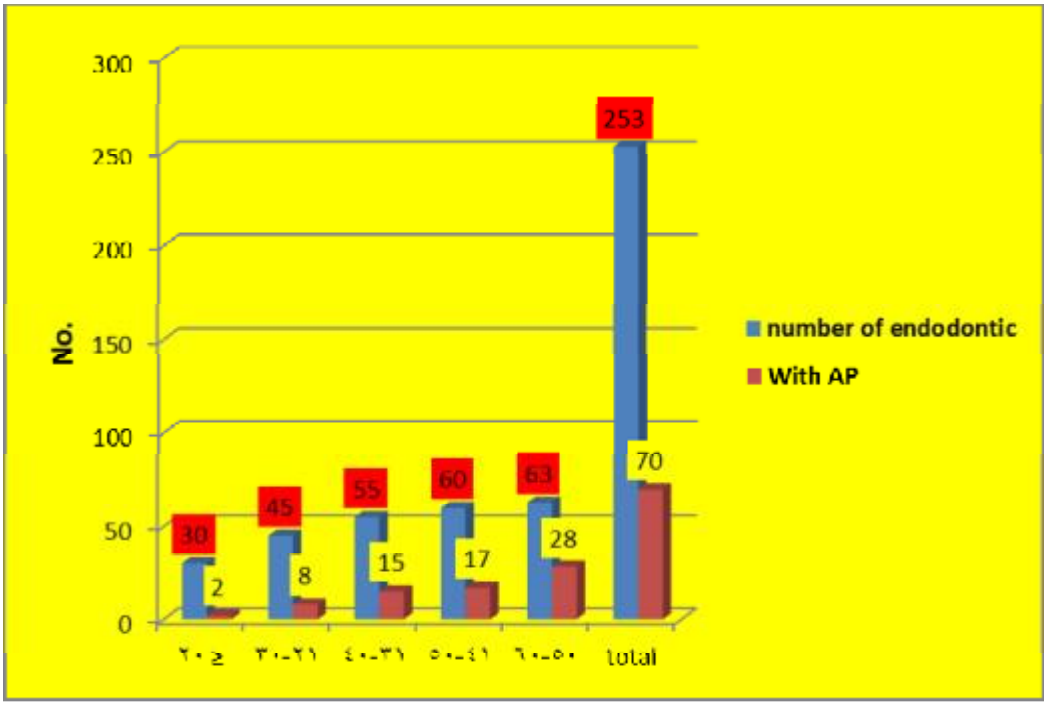

Figure (2) :The age distribution of examined teeth according to endodontic treatment and these teeth with AP.

Table (2): The gender distribution of examined teeth according to the apical status and endodontic treatment.

Gender	No.	number of endodontic with or without AP	number of AP with or without endodontic treatment
female	2732 (46.9%)	140 (55.3%)	63 (40.4%)
male	3090 (53.1%)	113 (44.7%)	93 (59.6%)
total	5822	253 (4.3%)	156 (2.6%)

Chi-square=2.032 p=0.048 P<0.05 Significant.
The Hypothesis between variables and the significant difference , H1 =0.952 P<0.05 Significant

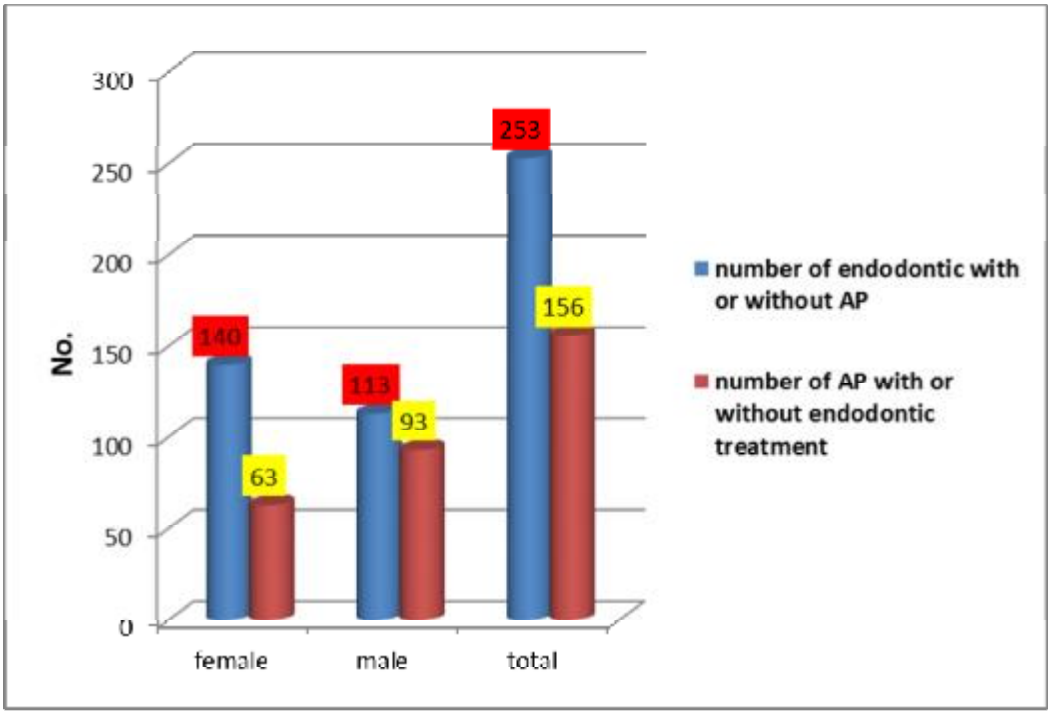

Figure (3) : The gender distribution of examined teeth according to the apical status and endodontic treatment .

Table (3) : The age distribution of examined teeth according to apical status.

age groups	number of teeth	number of AP with or without endodontic treatment
≥ 20	1200	16 (10.3%)
21-30	1300	25 (16%)
31-40	1512	32 (20.5%)
41-50	1010	38 (24.3%)
50-60	800	45 (28.8%)
Total	5822	156

Chi-square=6.198 p=0.003 P<0.05 Significant.
The Hypothesis between variables and the significant difference , H1 =0.997 P<0.01 high Significant

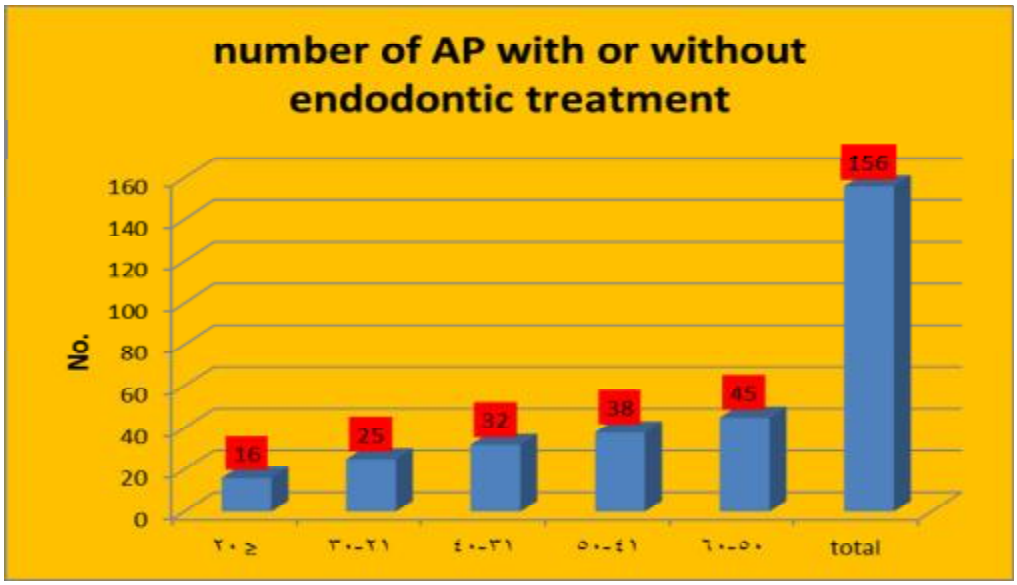

Figure (4) : The age distribution of examined teeth according to apical status.

Table(4) : The age distribution of examined teeth with AP according to scores .

age groups	scores			Total
	number of score 3	number of score 4	number of score 5	
≥ 20	8	5	3	16
21-30	13	7	5	25
31-40	20	7	5	32
41-50	18	17	3	38
50-60	28	10	7	45
Total	87	46	23	156

Chi-square=7.265 p=0.026 P<0.05 Significant

The Hypothesis between variables and the significant difference , H1 =0.974 P<0.05 Significant

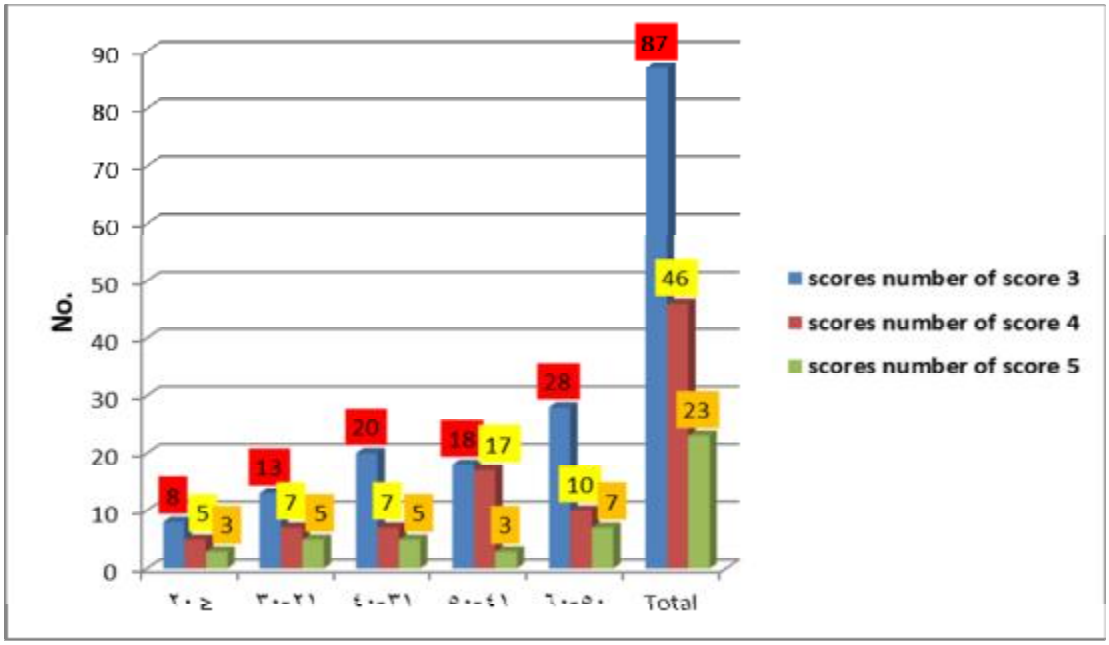

Figure (5) : The age distribution of examined teeth with AP according to scores.

Table (5) : The endodontic treated teeth distribution according to age and gender in upper jaw .

age groups	Gender	upper incisors	upper cuspid	upper premolars	upper 6	upper 7
≥ 20	Female	1	0	3	2	0
	Male	3	0	2	1	0
21-30	Female	1	0	5	3	4
	Male	1	0	3	2	1
31-40	Female	0	0	6	5	2
	Male	2	0	3	3	1
41-50	Female	1	0	4	4	1
	Male	2	0	8	6	0
50-60	Female	2	1	7	6	0
	Male	4	0	5	2	0

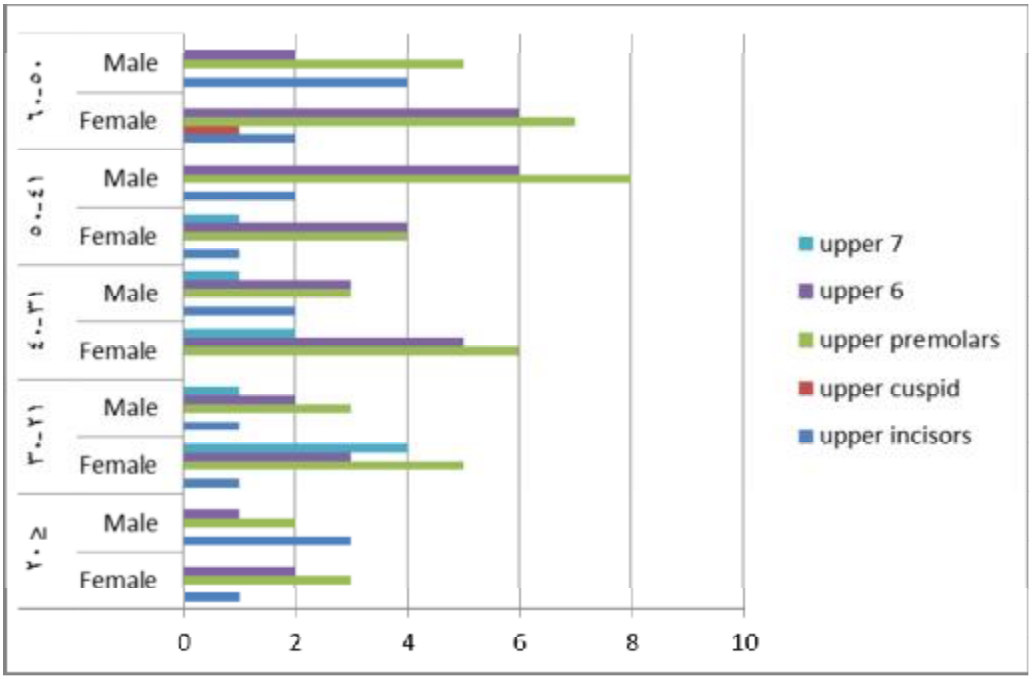

Figure (6) : The endodontic treated teeth distribution according to age and gender in upper jaw .

Table (6) : The endodontic treated teeth distribution according to age and gender in lower jaw .

age groups	Gender	lower incisors	lower cuspid	lower premolars	lower 6	lower 7
≥ 20	Female	0	0	3	7	2
	Male	0	0	2	3	1
21-30	Female	0	0	2	9	4
	Male	0	0	1	6	3
31-40	Female	0	0	4	10	6
	Male	0	0	2	7	4
41-50	Female	0	0	1	10	5
	Male	0	0	1	10	7
50-60	Female	4	1	5	6	3
	Male	3	1	3	5	5

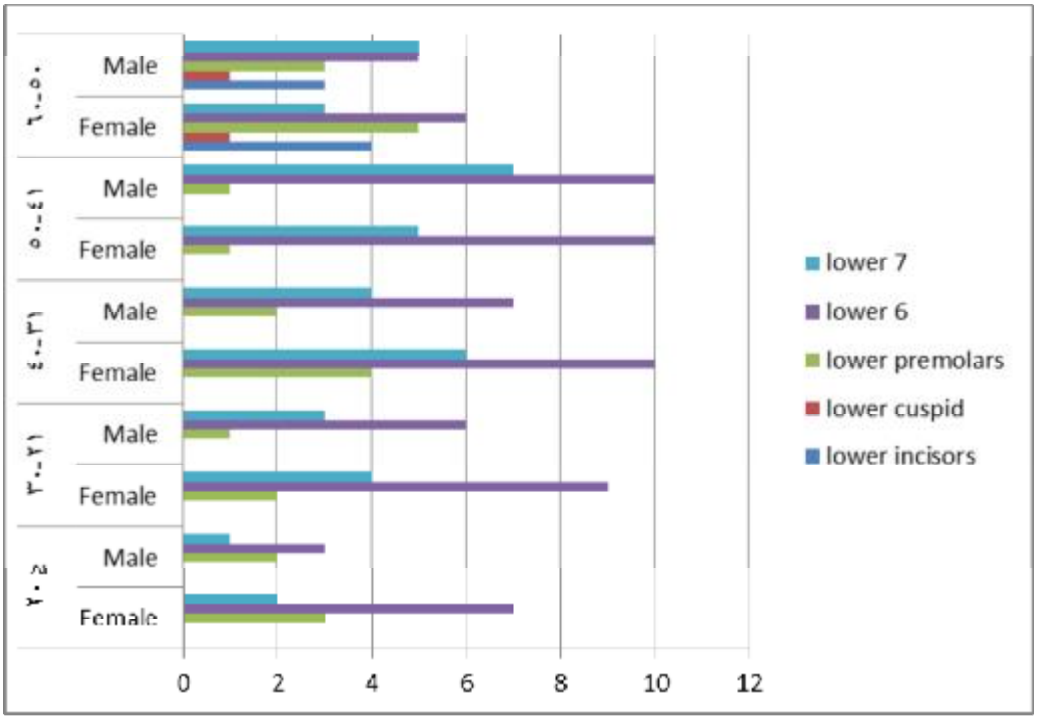

Figure (7) : The endodontic treated teeth distribution according to age and gender in lower jaw .