Gingival health status and oral hygiene among patients attending health centers aged (20-80) years in Erbil city

Received: 2/6/2010 Accepted: 27/2/2011

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Abstract

Background and objectives: Aims of the present study were to investigate the gingival health status in different age groups of both genders in (300) subjects aged 20–80 years, also to fined the effect of the frequency of tooth brushing and education level on gingival health of adult population in Erbil city.

Methods: The examination was performed using plaque, gingival and calculus indices. The level of education and frequency of tooth brushing were reported.

Results: Demonstrated that ; the total mean for plaque(1.18) ,gingival (0.97) and calculus (0.19) scores were increased with increasing age with significant differences fore plaque (P-value =0.017) and calculus(P-value =0.00) score but with no significant difference for gingival score(P-value =0.31) . Males reported higher means than females for plaque and gingival score while male reported equal means with female for calculus with no significant differences. (P-value =0.41), (P-value =0.16), (P-value =0.82) respectively.

The highest mean of plaque (1.68), gingival (1.43) and calculus (0.31) scores were seen related to non brushing group with significant differences between all groups.
(P-value =0.00)

The highest mean of plaque (1.45), gingival, (1.19) and calculus (0.23) scores, were seen related to illiterate level of education with significant differences between all groups.
(P-value =0.00)

Conclusion: Females reported less mean plaque score and more healthy gingiva than males. Gingival, plaque and calculus scores were increasing with age. Most of the of them needs increasing their level of education and oral health education.

Key words: plaque, calculus, gingiva, brushing, level of education.

Introduction

Oral health is an essential and integral component of health throughout life. No one can be truly healthy unless he or she is free from the burden of oral and craniofacial diseases and conditions[1]. Investigations show that marginal gingivitis starts in early childhood and its incidence and degree of severity increases in adolescence, whereas in the next decade, the incidence of gingivitis spreads insignificantly.

However, gingivitis of adults appears in a more severe form. After evaluation of the general incidence among the adult population, it was stated that from 50,0 to 100,0% of people suffer from gingivitis[2]. The main provoking factor that induces inflammation of gingival tissue is the presence of bacterial biofilms (dental plaque) on the teeth/gingival interfaces[3].

Despite great improvement in the oral health of populations globally, problems still persist, particularly among underprivileged groups, both in developed, and developing countries [4]. Oral hygiene reflects the amount of plaque on teeth, and it is reasonable to predict that the level of oral hygiene in a population is positively

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correlated with the prevalence and severity of periodontal diseases [5,6]. The most widely accepted risk factor is dental plaque that forms on the teeth because of the lack of effective oral hygiene. The most effective method of dental plaque removal is regular tooth brushing [6,7]. Prevention of gingivitis, in the individual patient or in populations, is still the first step toward preventing periodontitis [8]. Prevention of these diseases among older subjects emphasizes elimination of plaque retentive factors, fluoride treatment, counseling on oral hygiene and diet [9,10]. The aims of the study were to:

1. Determine the gingival health status in both genders and different age groups among adult population aged 20–80 years.
2. To find that if there is effect of frequency of tooth brushing and education level on oral hygiene and gingival health status in Erbil city.

Methods

The total sample was composed of 300 individuals (150 male and 150 female) age ranging between 20–80 years divided into 5 age groups of 10 years interval: 20-29, 30-39,40-49,50-59 and ≥60 years adult people were seeking for dental treatment , who were attending the only four medical centers ,Ministry of Health which present in different health center in Erbil city named (Shahidan ,Soltan Mozafar,Newroze, Malla Afandy) in different region .They were medically fit ,selected randomly for examination by one examiner(the authors). There are (16) health centers in Erbil city, every (2) or (3) districts are the responsibility of one health center, so the authors chose (4) health centers randomly, the examination was done twice weekly and (15) subjects examined on every call.

The clinical examinations were performed in the dental clinic of medical centers. The plaque index by Silness J& Löe [11], gingival index by Löe H& Silness [12] and calculus index by Ramfjord [13] were used for the examination of six teeth which represent six segments of the jaw [13] upper right 1st molar ,upper left central incisor and upper left 1st premolar ,lower right 1st premolar and central incisor and lower left 1st molar. Patient who had less than 20 teeth were excluded from the study.

The examination was done by using plane mouth mirrors, WHO periodontal probes to detect the dental plaque and gingival health cotton and disinfectant agent were also used.

The patients were asked about there level of educations and determined by giving the scores [14].

Score 0-Illiterated
Score1-Primary school
Score2-Secondary school
Score3-High school
Score4-College

Also they were asked about the frequency of tooth brushing and a score was given according to [15]: Score 0-Non brushing:
Score1-Some time brushing (once twice,or three times a week)
Score2-Once a day
Score3-Twice a day
Score4- More than twice in a day.

The statistical analysis of the data was carried out by using (SPSS) version was 11.5.This includes:

1. Descriptive statistics (mean, standard error, and percentage).
2. Using S.N.K Multiple Range Test and analysis of variance (ANOVA) test.

Results

The total sample consists of 300 individuals comprising 50% males and 50% females. The population sample is divided into 5 age groups as in Table (1).

Mean plaque index scores are seen in Table (2) according to gender and age groups. The mean plaque for the total sample was 1.18 and the males reported higher mean than females in the first, third, fourth, fifth age groups and also the total except the second age groups; female reports higher mean than male group with statistically no significant difference of plaque accumulation between both male and female groups. The study include that

the mean plaque is increased with age with statistically significant difference at 0.05 levels.

Table (3) demonstrated that the mean gingival score according to gender and age groups. The mean for the total sample was (0.972). Males reported higher mean gingival score than female but the difference was not found to be statistically significant. The mean gingival score was increased with age but with no statistically significant difference (P> 0.05).

Mean calculus index scores are shown in Table (4) according to gender and age groups. The mean calculus for the total sample was 0.19 and the males reported slightly higher mean than females in the third and, fifth age groups while in the second and fourth age group females reports slightly higher means than male and in the first age group they report equal amount of calculus also as a total female showed equal mean of calculus with male (0.18); with statistically no significant difference of calculus accumulation between both male and female groups. The study found that the mean calculus was increased with age with statistically significant difference at 0.05 levels.

Mean plaque, calculus and gingival indices scores are shown in (Table 5) according to frequency of tooth brushing. The highest mean of plaque, calculus and gingival indices were seen related to non brushing group of both genders, with highly significant differences (P-value <0.005). The data collection about teeth brushing shows that highest percentage of population were brush their teeth once a day (% 33); and (15.6%) were brushing their teeth twice ,females reported more frequent teeth brushing than males.

Mean plaque, calculus and gingival indices scores are demonstrated in (Table 6) according to their level of education. The highest mean of plaque, calculus and gingival scores were seen related to illiterate level of education of male and female groups. Statistical analysis showed highly significant differences of plaque, calculus and gingival scores of male and female groups according to there level of education.

Table 1: The number and percentage of individuals distributed according to gender and age groups

Age groups	Males No.%	Females No.%	Total No.%
20-29	65 (43.3)	55 (36.7)	120 (80.0)
30-39	38 (25.3)	49 (32.7)	87 (58.0)
40-49	19 (12.7)	27 (18.0)	46 (30.7)
50-59	19 (12.7)	11 (7.3)	30 (20.0)
≥60	9 (6.0)	8 (5.3)	17 (11.3)
Total	150 (100)	150 (100)	300 (200)

Table 2: The mean and standard error of plaque index according to genders and age groups.

Age group	Males	Females	*P-value	Total	**P-value
	Mean± SE	Mean± SE		Mean± SE	
20-29	1.17 ± 0.09	1.05±0.06	0.141 NS	1.12±0.07	0.017 S
30-39	0.98 ±0.13	1.15±0.11		1.10±0.09	
40-49	1.28 ±0.19	1.14±0.16		1.11±0.12	
50-59	1.55 ±0.18	1.13±0.27	F=2.179 df=1 298 299	1.39±0.15	F=3.079 df=4 295 299
≥60	2.22 ± 0.15	1.13±0.33		1.70±0.22	
Total	1.25±0.0.07	1.11±0.06		1.18±0.09	

*Not significant difference of plaque accumulation between both male and female groups.
** Statistically significant difference of plaque accumulation according to age groups at 0.05 levels.

Table 3: The mean and standard error of gingival index according to genders and age group

Age group	Males	Females	*p-value	Total	**p-value
	Mean ± SE	Mean ± SE		Mean ± SE	
20-29	1.0±0.09	0.88 ±0.09	0.160 NS	0.95±0.64	0.311 NS
30-39	0.89±0.11	0.89±0.10		0.89±0.73	
40-49	1.02±0.12	0.99±0.12		1.0±0.10	
50-59	1.23±0.15	1.08±.23	F=1.986 df=1 298 299	1.174±0.12	F=1.199 df=1 298 299
≥60	1.42±0.24	0.817±0.26		1.135±0.20	
Total	1.03±0.06	0.916±0.05		0.972±0.04	

*Not statistical significant difference of gingival score between male and female groups.
** No statistical significant difference gingival score according to age groups.

Table 4: The mean and standard error of calculus index according to gender and age group.

Age group	Males Mean ± SE	Females Mean ± SE	*P-value	Total Mean ± SE	**P-value
20-29	0.11±0.03	0.11±0.02		0.11 ±0.02	
30-39	0.15±0.04	0.19±0.03	0.827 NS	0.19±0.03	0.00 S
40-49	0.29±0.08	0.23±0.05		0.23±0.05	
50-59	0.20±0.07	0.24±0.07	F=0.048 df=1 298 299	0.24±0.07	F=6.43 df=4 295 299
≥60	0.53±0.15	0.50±0.14		0.50±0.14	
Total	0.18 ±0.24	0.18 ±0.02		0.19±0.02	

*****Not statistical significant difference of calculus accumulation between males and females groups.
****** Statistically significant difference of calculus accumulation according to age groups

Table 5: The number, percentage, mean and standard error of plaque, calculus and gingival indices according to frequency of tooth brushing.

Frequency of tooth brushing	**Male N0.%**	**Female N0.%**	**Total N0.%**	**Plaque index Mean ±SE**	**Calculus index Mean ±SE**	**Gingival index Mean ±SE**
0	40(26.6)	37(18)	77 (25.6)	1.80±0.07	0.31±0.05	1.43±0.07
1	37(18)	34(22.6)	71(23.6)	1.25±0.08	0.15±0.03	0.96±0.08
2	48(32)	51(34)	99(33)	0.97±0.07	0.12±0.02	0.83±0.06
3	24(16)	23(15.3)	47(15.6)	0.58±0.10	0.17 ±0.05	0.60±0.10
4	1(0.6)	5(3.3)	6(2)	0.31±0.30	0.17 ±0.11	0.40±0.35
Total	150(100)	150(100)	300(100)	1.18±0.04	0.19±0.20	0.97±0.04
*P-value				0.000	0.0.003	0.0000
				F=30.54 df=4 295 299	F=4.19 df= 4 295 299	F=16.87 df=4 295 299

***** Statistically significant differences of plaque ,gingival and calculus scores were seen between males and females according to tooth brushing (P-value <0.005).

Table 6: The mean and standard error of plaque, calculus and gingival indices according to level of education.

Level of education	Plaque index Mean ±SE	Calculus index Mean ±SE	Gingival index Mean ±SE	Total N0.%
0	1.45±0.06	0.23±0.03	1.19±0.06	139(46.3)
1	1.22 ±0.11	0.19±0.06	0.95±0.10	40(13.3)
2	1.10 ±0.17	0.18±0.05	0.96±0.15	25(83.3)
3	0.90 ± 0.10	0.12±0.03	0.81±0.09	58(19.3)
4	0.60 ±0.11	0.09±0.03	0.45±0.08	38(12.6)
Total	1.18 ±0.05	0.19±0.02	0.97±0.04	300(100)
	0.000 (S)	0.031 (S)	.000 (S)	
*P-value	12.72	2.71	10.89	
F	4	4	4	
df	295	295	295	
	299	299	299	

***** Statistical significant differences of plaque, calculus and gingival scores of male and female groups according to there level of education

Discussion

Prevention of gingivitis and periodontitis is based on control of their causal and risk factors. The most widely accepted risk factor is dental plaque that forms on the teeth because of the lack of effective oral hygiene [6,7] .

The result of present study reveled that, the mean plaque score for the total sample was moderate and the males reported higher mean than females in the first, third, fourth and fifth age groups and also the total mean of plaque is higher in male than female, although females suffering from hormonal changes due to pregnancy and post menopausal but the current study reveal highest mean of plaque accumulation among males this is may be due to that the female care much about of their looking with statistically no significant difference of plaque accumulation between both genders groups. This was in accordance with other studies [16, 17] .

The plaque accumulation increased with increasing age and there was a significant difference between the first, second, third and fifth age groups. This finding is in agreement with other studies. [18]; this might be due to lack of proper oral hygiene in older age. It has been generally claimed that increasing age is a risk for periodontitis and that aged persons are more at risk than younger persons for periodontal diseases this is may be due to chronic systemic disease or reducing immunity at older age. Evidence shows that manifestations of periodontitis are more severe in older than in younger individuals. Some studies in Iraq indicated that main cause of increasing plaque accumulation is related to low dental educational level [19,20].

In the present study males reported higher mean gingival score than females but the difference was not found to be statistically significant (p-value >0.05). This was in contrast with the study [16] in which female reported higher mean of gingival score than male .This study is in agreement with other studies [21,22] state that female tended to have higher percentage of healthy gingiva ,although female suffering from gingivitis and periodontal problem more than male due to hormonal changes and pregnancy but the current study is reported more healthy gingiva than male

this is may be attributed to the habit and conscious of females in doing a better oral hygiene practice.

The mean gingival score for the total was increased with age but statistically with no significantly difference at 0.05 levels. That means the youngest age groups (20–29and30-39 years) have healthier gingiva than the older age groups. This means that this age group cares for their gingival health more than old age in addition that old age groups suffering from hormonal changes, reducing immunity, chronic diseases and medications more than young age. This finding is in agreement with other studies which stated that prevalence of periodontal disease was found in about 100% in adult 35 year of age and older [16] .

The mean calculus for the total sample was 0.19. The total mean of calculus index was equal between male and female group; with statistically no significant difference of calculus accumulation between both genders. This was in contrast with the studies [23 ,24], in which they found statistically significant difference of calculus accumulation between both male and female groups.

Calculus was the most frequently observed periodontal condition for the patients as a whole and all age group. The current study revealed that the mean calculus is increased with age with statistically significant difference at 0.05 levels. This finding is in agreement with other studies which they stated that the mean number of sextants with calculus and pockets increased with age [25]. The findings suggest that periodontal disease prevalence ranged from moderate to high. When making comparisons with other studies, for example in the age group 35-44 years. They are also comparable to another study conducted in a rural area in Nineveh governorate [25].Similarly, a high prevalence of dental plaque and calculus has been highlighted in other Asian countries [26,27,].

Tooth brushing data indicate that about 25.6% of sample did not brush their teeth and 18% female). This is may be due to low level education. while (Mosul), it was 60% not brushing their teeth [25].

As in most studies female reported more frequent brushing teeth than male because female is consistently more likely to brush frequently than male. Gender differences should be noted in order to enhance tooth-brushing behavior .This was in accordance with many studies [28]. A clear relationship appeared between a higher frequency of tooth-brushing and better oral hygiene for both genders, a positive sign of the role of tooth-brushing frequency in dental and gingival health [29].

In the present study the highest percentage of teeth brushing were once a day 33 % while the high prevalence of dental plaque among the present young adults results from their poor oral hygiene practices only (26% of the adult population reported twice daily teeth brushing [30]. In Iran, it seems to be a demanding challenge to reach the goal of twice-daily tooth-brushing, since no more than 57% to 67% of dental educators, dental students, and dentists themselves perform twice daily tooth-brushing [31,32]. In Europe and North America the corresponding percentages for adolescents range from 18% to 86% [33]. Studies in Korea indicated that the person who brushed their teeth two or more times showed about 60% of risk to have periodontitis compared with one or less times tooth-brushing per day [34].

The highest mean of plaque, calculus and gingival indices were seen related to non brushing group of male and female. This was in accordance with many studies [21,35] in which they found that the lowest number of subject with a healthy periodontal status was demonstrated in those with plaque index 3 category, who did not brush daily ($P < 0.0005$).

Regularly reported tooth cleaning according to their level education, the highest mean of plaque, calculus and gingival indices were seen related to first illiterate groups of level of education between male and female groups. The present findings are consistent with earlier reports indicating that well educated individuals maintain

a more favorable oral health status than do less-educated individuals [35,36,37] ;implying that ineffective teeth cleaning seems to be particularly common in elderly subjects in general, and, especially among men and those with a lower educational attainment.

Conclusion

Periodontal disease are very important public health problems in the most of developing countries .Therefore, an efficient dental health care instruction program should be constructed to achieve an acceptable standard of oral hygiene.

From this study the periodontal conditions of people have shown that gingivitis is very common in some population groups. Males reported higher mean plaque score than females because females care much about their looking and practice of tooth brushing. The gingival health, plaque and calculus scores were increasing with age due to the accumulative nature of the disease. Majority of the subjects needs oral health education.

References

1. U.S. Department of Health and Human Services (HHS). Oral Health in America: A Report of the Surgeon General. Rockville, MD: HHS, National Institutes of Health, National Institute of Dental and Craniofacial Research, 2000..
2. Sheiham A. In the chemical prevention of gingivitis necessary to prevent severe periodontitis. Periodontol 2000. 1997; 15:15-24.
3. Haffajee AD, Socransky SS. Microbial etiological agents of destructive periodontal diseases. Periodontol 2000. 1994;5:78-111.
4. Petersen PE. The World Oral Health Report: continuous improvement of oral health in the 21stcentury – the approach of the WHO Global Oral Health Programme. Community Dent Oral Epidemiol 2003; 31(Suppl. 1): 3-24.
5. Albander JM. Global risk factors and risk indicators for periodontal diseases. Periodontol 2000 2002;29: 177-206
6. Löe H. Oral hygiene in the prevention of caries and periodontal disease. Int Dent J 2000; 50: 129-139.
7. Pihlstrom BL, Michalowicz BS, Johnson NW. Periodontal diseases. Lancet 2005; 366: 1809-1820.
8. Muller HP, Heinecke A, Eger T. Site-specific association between supragingival plaque and bleeding upon probing in young adults. Clin Oral Investigations 2000;4:212-218.
9. Curzon MEJ, Preston AJ. Risk groups: nursing bottle caries/Caries in the elderly. Caries Res 2004; 38(Suppl 1): 24-33.
10. Axelsson P, Albandar JM, Rams TE. Prevention and control of periodontal diseases in developing and industrialized countries. Periodontol 2000 2002; 29: 235-246.
11. Silness J, Löe H. Periodontal disease in pregnancy. II. Correlation between oral hygiene and periodontal condition. Ac-ta Odontol Scand. 1964; 22: 121-135.
12. Löe H, Silness J. Periodontal disease in pregnancy. I. Prevalence and severity. Acta Odontol Scand. 1963; 21: 533-551.
13. Ramfjord SP ,:indices for prevelance and incidence of periodontal disease .J Periodontal .1959 ;30:51-59.
14. Al Juboory IKC ,1999: evaluation of dental health knowledge attitude and oral health status of pregnant women in Baghdad city.MSc Thesis College of dentistry ,University of Baghdad; 38-39.
15. Baban D,2003:prevelance and severity of periodontal disease in pregnant women .MSc Thesis ,College of dentistry ,Hawler Medical University.
16. Salman FD, Al–Naimi RJ, Al–Sayagh GhDh. Oral hygiene and gingival health among adult population (21–80) years in Thamar–Yemen . Al–Rafidain Dent J. 2004 ; 4 (1) :49-54.
17. Abdal AK, Khamrco TY. Oral and dental health status in Sharkhan village.J Coll Dent.2000;6:150-156.
18. الشيخ عبدال ،عبدالخالق ،خمركو،طارق يوسف.حالة صحة الفم والاسنان في قرية الشريخان ،مجلة كلية طب الاسنان 2000؛6: 150-156 .
19. Gasgoos SS, Gasgoos SS,Al–Saleem NR. The effect of dental educational level in adults (18–25 years old)with crowded teeth on the plaque and gingival conditions.Al–Rafidain Dent J.2005; 5(2): 127-131.
20. Ali NA. A comparative study evaluatingthe effect of dental health educationprograms on the oral health status of 12years old students in Baghdad. MSc thesis.College of Dentistry. University ofBaghdad. 1999.
21. Ashraf-Sadat Sanei DDS , Alireza Nikbakht-Nasrabadi PhD: Periodontal health status and treatment needs in Iranian adolescent population.2005; Archives of Iranian Medicine2005, 8(4), 2005: 290 – 294.
22. Mombiedro-Sandoval R, Llena-Puy C. Periodontal status and treatmentneeds among spanish military personnel. Med Oral Patol Oral Cir Bucal.2008 Jul 1;13(7):E464-9..
23. Khamrco TY. Assessment of periodontal disease using CPITN index in a rural population in Ninevah, Iraq. East Mediterr Hlth J. 1999; 5(3): 549-555.
24. Salman FD, Saleh KhM , Qasm AA.Dental health status of adult population in Yemen

(Thamar city). Al–Rafidain Dent J. 2006 ; 6 (2) :144-150.

25. Dini EI.Changes of periodontal condition of children and adolescents from Araraquara, Brazil.Braz Dent J.2001,12(1):51-55.
26.Kumar TS, Dagli RJ, Mathur A, Jain M, Balasubramanyam G, Prabu D, Kulkarni S. Oral health status and practices of dentate Bhil adult tribes of southern Rajasthan, IndiaInt Dent J. 2009 Jun;59(3):133-40.
27.Salman, FD, Qasim AA, Saleh KhM. Oral health status and treatment needs of Iraqi
and Yemeni dental students A comparative study). Al–Rafidain Dent J. 2005; 5(1):
46-51.

28. Mutaz Gh ALI, Talal H AL SALMAN, Nawfal A ZAKARIA .The oral and dental health status among people in Sharkhan village .Al–Rafidain Dent J. 2001; 1 (2):166-174.
29.Murray JJ, Nunn JH, Steele JG. Prevention of oral disease. 4th ed. Oxford: Oxford University press 2003. pp: 7-34, 77-95, 123-144, 241-258
30.HESSARI HOSSEIN. Oral Health among Young Adults and the Middle-aged in
Iran. Department of Oral Public Health, Institute of Dentistry, Faculty of Medicine,University of Helsinki, Helsinki, Finland. 2009. 69 pp. ISBN 978-952-10-5458-7
31. Ghasemi H, Murtomaa H, Vehkalahti MM, Torabzadeh H. Determinants of oral health behaviour among Iranian dentists. Int Dent J 2007; 57: 237-242.
32.Khami MR, Virtanen JI, Jafarian M, Murtomaa H. Oral health behaviour and its determinants amongst Iranian dental students. Eur J Dent Educ 2007; 11: 42-47.
33.Maes L, Honkala S. Tooth brushing and social characteristics of families in 32 countries. Int Dent J2006; 56: 159-167
34.Youn-Hee Choi1, Hye-Jin Baek, Keun-Bae Song, Ji-Youn Han, Hojang Kwon. Prevalence of periodontitis and associated risk factors in Korean adults: Korean National Oral Health Survey 2006. J Korean Acad Periodontol 2009;39:261-268
35. Pudule I, Villerusa A, Grinberga D, Velika B, Tilgale N, Dzerve V, Zile S, Konttinen H, Prättälä R. Health behavior among Latvian Adult Population, 2006. Publications of theNational Public Health Institute,Finland, B27/2007, Helsinki 2007.
36. Petersen PE, Bourgeois D, Ogawa H, Estupinan-DayS, Ndiaye C. The global burden of oral diseases andrisks to oral health. Bull World Health Organ2005;83:661–669.
37. Suominen-Taipale L, Nordblad A, Vehkalahti M, Aromaa A (eds.). Oral Health in the Finnish Adult Population. Health 2000 Survey. Publications of the National Public Health Institute B 25/2008. Helsinki: Hakapaino Oy, 2008, pp 205.