

## Chewing Khat and periodontal health status in Dhamar -Yemen

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### ABSTRACT

The clinical examination involves eighty one males Yemenis, in Dhamar of age 15 – 45 years old and of similar and regular daily habit of chewing Khat unilaterally at the left side of the oral cavity to enjoy the amphetamin – like effect of Khat as a stimulant in a company with their friends under special environment & social rules in Yemen since a lot of years ago.

The sample was divided equally into three age groups, ( 15 – 24 years), (25– 34 years ) and ( 35–45 years ).The periodontal health status examined clinically to measure the plaque index, gingival index and periodontal pocket depth.

Measurements divided into three groups, non – chewing right site of the mandible, and chewing left buccal site and chewing left lingual site of the mandible in the same individual.

The periodontal health status according to the three parameters, revealed that the scores at the chewing site were higher than that at the non-chewing site, and higher buccally than lingually at the same chewing site.

With the age and prolong abuse of Khat chewing, the scores increased and the periodontal pocket depth significantly differed in the age group (35– 45 years) than the (15 –24 years) and (25 – 34 years), age group.

The periodontal pockets were significantly higher buccally than lingually at the same chewing site, may be due to the manner of Khat chewing, where the leaves of Khat accumulate gradually and held in the lower buccal pouch unilaterally in a bolus for several hours daily.

**Key Words** :Khat, chewing, periodontal health status.

### الخلاصة

شمل الفحص السريري (٨١) ذكراً يمينياً من مدينة ذمار في اليمن بعمر (١٥-٤٥ سنة) اعتادوا على مضغ القات يومياً وعلى جهة واحدة من الفم وهي جهة اليسار ليتمتعوا بتأثير القات كمحفز مشابه لتأثير الأمفيتامين ضمن قواعد وشروط اجتماعية مع لفيف من الأصدقاء منذ عدة سنوات. قُسمت العينة بالتساوي إلى ثلاثة مجاميع عمرية (١٥-٢٤ سنة) و (٢٥-٣٤ سنة) و (٣٥-٤٥ سنة) وتم فحص حالة صحة اللثة وما حول الأسنان سريرياً لقياس دلالة الطبقة الجرثومية ودلالة اللثة وقياس عمق جيب اللثة. قُسمت القياسات إلى ثلاثة مجاميع: جهة يمين من الفك السفلي غير مستعملة بالمضغ، وجهة يسار خدي مستعملة بالمضغ، وجهة يسار لساني مستعملة بالمضغ لنفس الفك ولنفس الشخص.

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بينت الفحوصات لحالة صحة اللثة وما حول الأسنان طبقاً للمعايير الثلاثة أن القراءات في الجهة الماضغة كانت أعلى منها في الجهة غير الماضغة وهي أعلى في المنطقة الخدية عنها في اللسانية لنفس الجهة الماضغة.

مع العمر وسوء استعمال القات ازدادت القراءات وعمق جيب اللثة باختلافات معنوية للفئة العمرية (٣٥-٤٥ سنة) عن الفئتين (١٥-٢٤ سنة) و (٢٥-٣٤ سنة).

كانت قياسات جيوب اللثة أعلى معنوياً في المنطقة الخدية عنها في اللسانية لنفس الجهة الماضغة ويعزى سبب ذلك إلى طريقة مضغ القات حيث تتجمع أوراق القات تدريجياً وتبقى في التجويف الخدي السفلي لجهة واحدة من الفم كلقمة ولعدة ساعات يومياً.

## INTRODUCTION

Khat or Qat (*Catha edulis*) is an evergreen shrub grown in Yemen and East Africa. The first evidence of using Khat in Yemen goes back to Arabian physician Najeeb Al-Deen in 1237 who prescribes Khat for the treatment of psychological depression. Others believe that Khat appeared in Yemen shortly after Islam & was used to dampen sense of hunger & fatigue.<sup>(1)</sup> Khat chewing, particularly in Yemen become a regular daily habit and forms a basis of social interaction and life style and that 70-80% of population of age (16 - 50 years) old are chewing Khat regularly and consume 12% of the family income and 55% of people consumption of water goes to this habits.<sup>(2)</sup>

Khat chewing differ from other stimulant agent is relation to the special way in using Khat. Young fresh leaves are chewed & held in the lower buccal pouch unilaterally in a bolus for 3 hours & longer<sup>(1)</sup>, or until evening for more than 8 hours.<sup>(2)</sup> The chewing habit usually accompanied by water or soft drinks to reduce dehydration in the oral cavity & facilitate swallowing. Usually they use the left site of the oral cavity on buccal surface of lower posterior teeth to to accumulate the leaves gradually<sup>(2)</sup>. Khat composed of phenylalkylamine alkaloids including (cathion, norephedrine, nor-pseudoephedrin and elulline), amino acids, tannins, vitamin & minerals & due to this content it acts as stimulant due to amphetamine-like alkaloids.<sup>(3,4,7,8)</sup>

## MATERIAL AND METHODS

Eighty one male patients accepted to be involved in this research and attend the dental clinic of the College of Dentistry in the University of Dhamar, where the clinical examination had been established.

This sample divided into three aged groups; (15 - 24 years), (25 - 34 years) and (35- 45 years) and they were unilateral chewing of Khat on the left side of the lower posterior teeth and quite healthy and free of systemic diseases and of regular daily manner of chewing Khat from 2 - 8 O'clock, more or less an hour.

The clinical examination includes :

- 1- The plaque Index ( P. I ). [ Silness & Løe, 1964 ]<sup>(11)</sup>.
- 2- The Gingival Index ( G. I ). [ Løe, 1963 ]<sup>(10)</sup>.
- 3- Periodontal pocket depth, measured by graduated periodontal probe at the interdental area of the involved tooth, mesially and distally. Every individual divided into chewing lower left site and non-chewing lower right site, and the chewing left site divided into buccal & lingual sites for measurements,<sup>(3)</sup> i.e the measurements of P.I & G.I, at the buccal left site to be compared with the measurements of the lingual left site of the chewing site & then to be compared with the non - chewing right site of the same person.

#### Statistical Analysis

Statistical analysis of the data included, the mean and standard deviation for plaque index, gingival index and the periodontal pocket depth. The differences between the parameters were tested according to the age and site examined, using student t-test at level  $P < 0.05$  and ANOVA, analysis of variance.

### RESULTS

Table (1) shows the mean of plaque index P. I, gingival index G. I, and periodontal pocket depth P. D, according to the age groups and sites examined. The mean P.I. was of higher scores at the chewing site, than at the non-chewing site. It was higher buccally than Lingually at the same chewing site, in the three age groups. The same result was with the mean G.I except in the group (25 – 34 years) where the lingual scores at the chewing site were less than that at the non-chewing site.

The mean of P.D in mm has the same result as P.I & G.I and the depth was higher in the (25 – 34 years) age group & higher in the (35 – 45 years) age groups.

Table (2) shows that the mean P.I in the age group (15 – 24 years), significantly differed from the other two age groups and that there was no significant differences between the (25 – 34 years) and (35 – 45 years) age groups.

Table (3) shows the mean PI according to the sites examined & that the buccal surface of the chewing site was significantly differed and higher than the lingual surface of the chewing site & than the non - chewing site. While when we compared the non-chewing site and the lingual surface of the chewing site, there was no significant difference.

Table (1): Plaque index, gingival index , periodontal pocket depth – mean and standard deviation according to age groups and sites examined.

	Age	Sites	Mean	±SD
Plaque Index	15 – 24 years	Right	1.22222	0.36324
		Buccal left	1.77778	0.66667
		Lingual left	1.22222	0.44095
		Total	1.40741	0.55534
	25 – 34 years	Right	1.33333	0.35355
		Buccal left	2.38889	0.54645
		Lingual left	1.50000	0.61237
		Total	1.74074	0.68459
	35 – 45 years	Right	1.33333	0.50000
		Buccal left	2.66667	0.50000
		Lingual left	1.38889	0.41667
		Total	1.79630	0.77533
	Total	Right	1.29630	0.39854
		Buccal left	2.27778	0.66986
		Lingual left	1.37037	0.49210
		Total	1.64815	0.69121
Gingival Index	15 – 24 years	Right	0.88888	0.74068
		Buccal left	2.33333	0.50000
		Lingual left	1.22222	0.3624
		Total	1.48148	0.82604
	25 – 34 years	Right	1.50000	0.35355
		Buccal left	2.22222	0.44096
		Lingual left	1.33333	0.43301
		Total	1.68519	0.55726
	35 – 45 years	Right	1.27778	0.36324
		Buccal left	2.33333	0.35355
		Lingual left	1.44444	0.52705
		Total	1.68519	0.62247
	Total	Right	1.22222	0.56045
		Buccal left	2.29630	0.24197
		Lingual left	1.33333	0.43835
		Total	1.61728	0.67672
Periodontal Pocket	15 – 24 years	Right	2.16667	0.53555
		Buccal left	3.16667	0.54486
		Lingual left	2.22222	0.44096
		Total	2.51875	0.63898
	25 – 34 years	Right	2.08333	0.12500
		Buccal left	3.55556	0.68211
		Lingual left	3.00000	0.89268
		Total	2.87693	0.88081
	35 – 45 years	Right	3.05555	0.80795
		Buccal left	4.72222	0.93912
		Lingual left	3.66667	0.90139
		Total	3.81481	1.10199
	Total	Right	2.43519	0.66720
		Buccal left	3.81481	0.97958
		Lingual left	2.96296	0.95752
		Total	3.07099	1.04001

Table (2): shows the mean of plaque index P.I., according to the age groups

Age (Years)	Subset	
	1	2
15 – 24	1.40741	
25 – 34		1.74074
35 – 45		1.79630

P. < 0.05

Table (3): shows the mean of plaque index P.I, according to the site examined

Sites	Subset	
	1	2
Right	1.29630	
Lingual Left	1.37037	
Buccal Left		2.27778

p < 0.05

Table (4) shows the mean of G.I according to age group, where there was no significant differences in the mean G.I of the three age groups, but the age group (15-24) was slightly lower than the tow age group.

Table (4): shows the mean gingival index G.I according to the age groups

Age (Years)	Subset
15 – 24	1.48148
25 – 34	1.68519
35 – 45	1.68519

p < 0.05

Table (5) shows the mean G.I according to the sites examined, where the buccal surface of the chewing site, significantly differed from the lingual surface of the same site & from the non- chewing site. There was no significant differences between the non-chewing site and the lingual surface at the chewing site.

Table (5): shows the mean of gingival index G.I, according to the sites examined

Sites	Subset	
	1	2
Right	1.22222	
Lingual Left	1.33333	
Buccal left		2.29630

p &lt; 0.05

Table (6) shows the mean P.D. according to the age groups. There was no significant differences between the (15 – 24 years) and (25 – 34 years) age group. But the (35 – 45 years) age group showed a significant differences and was higher than the other age groups.

Table (6): the mean of periodontal pocket depth P. D., according to the age groups

Age (Years)	Subset	
	1	2
15 – 24	2.51852	
25 – 34	2.87963	
35 – 45		3.81481

p &lt; 0.05

Table (7) shows the mean P.D according to the sites examined. There was a significant differences between the chewing site & non-chewing site and also between the buccal and Lingual of the same chewing site.

The higher mean was at the buccal surface of the chewing site, then at the Lingual surface of the chewing site, and then at the non - chewing site.

Table (8) shows the relations of the three periodontal parameters, P. I, G. I and P. D. with the age.

There was a significant difference in P. I of the sample size (P.I/person) with age.

The G.I showed no significant difference.

The P.D. showed a highly significant difference with age.

Table (7): the mean of periodontal pocket depth P.D according to the sites examined

Sites	Subset		
	1	2	3
Right	2.43519		
Lingual Left		2.96296	
Buccal Left			3.81481

p&lt;0.05

Table (8): plaque index P.I., gingival index G.I. and periodontal pocket depth as a sample size in relation to age

Age	Variables	Mean square	F	Significance
	P. I.	1.194	4.793	0.11
	G. I.	0.373	1.703	0.189
	P. D.	12.084	25.642	0.000

p&lt;0.05

## DISCUSSION

Chewing Khat in Yemen is the most common finding where the people arrange special location time and friends to enjoy chewing Khat. It's not a habit, it's a regular manner & a special style of life following certain social rules which make a deep discussion in what they believe in, something quite difficult, for these conditions, the examination include males only and in order to reduce the variables, the 60 persons were of similar manner of chewing Khat in relation to systemic condition, site of chewing, duration, Liquid used during chewing and the amount usually used. The individuals excluded were usually due to liver deficiency, infectious diseases, bleeding disorder and a large group of people had not attend the dental clinic.

The results of our clinical examination revealed that the mean plaque index was higher at the buccal left chewing site than at the Lingual of the same site, and that the chewing site (left site) showed higher scores than non-chewing site (right site) in the 3 age groups. The same results was with the periodontal pocket depth were it was deeper at the chewing site than non-chewing site.

The same result was with the mean Gingival index except in the age group (25 – 34 years) where the Lingual mean of G.I at the chewing site less than that at the non-chewing site.

Statistically there was a significant difference between the mean P.I of the buccal & Lingual sites of the chewing site, but between the chewing & non-chewing site, there was no significant difference.

The age group (15 – 24 years) showed mean P.I less than the other groups & differ significantly from them.

The G.I according to the age groups showed no significant differences, but the buccal left differ significantly from the Lingual left, while the Lingual left did not show a significant difference from the right non-chewing site.

The results related to the periodontal pocket depth showed a higher scores buccally than lingually, & at the chewing site than non-chewing site and significantly differed.

The highest score or the deepest pocket were recorded at the (35–45 years) age group. Statistically, there was a significant differences related to the sites, but according to the age groups only the (35 – 45 years) age showed a significant difference than the others.

We can observe that the measurements were higher at the chewing site than the non-chewing site & this result is similar to that found by<sup>(5)</sup>, who they compared the periodontal pocket at the right & left of 43 Yemens who used to chew Khat at one site. And also agreed with<sup>(9)</sup> who observed a high rate of periodontal disease in Khat chewers.

Mengal et al 1996<sup>(12)</sup>, examined a sample at (12 – 44 years) old using community periodontal index of treatment need (CPITN) & showed that this index was significantly higher for Khat consumer than for non-consumer.

These results may help us to understand that Khat does not have an effect on general health and attitude, or just consuming our life time, or make an economical difficulties for each family, but also chewing Khat & accumulation in the oral cavity will make a disharmony in the external morphology of the face & Localize a pressure at the gingival tissue to be detached away & gradually along the years from the tooth & this will necessitate a progressive & concentrated periodontal education & therapeutic programs which need a man power and cost a lot.

In conclusion : the past researches showed that the oral health status for Khat consumer was bad more than non – consumer & our result showed that chewing is more damaging periodontally to the related site than non - chewing site.

Therefore, education's programs should orient the individuals for the preventive measures of periodontal status & to the role of chewing at the periodontium.

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