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Caries experience and salivary interleukin-17 level in pre and postmenopausal women

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Abstract Background: The oral tissues has been affected by menopause in the same way as the other human body systems .Aim of study: This study was set for estimating the experience of caries in correlation to the salivary interleukin-17 level in post-menopausal and pre-menopausal women .Materials and Methods: Females which aged (47-51) years old divided in to : First group (control group) contained forty five pre-menopausal females and the second group (study group) contained forty five post-menopause females and were examined for caries experience on the authority of WHO,(1997)).We'd collect the un stimulated saliva from all females to analyses salivary interleukin-17 level ..Results: In control group the pre-menopause; the mean value of Decayed Surfaces, Missed Surfaces and DMFS were lower than that of study group the post-menopause group with lower level of salivary interleukin-17 .Conclusion: menopause influence female's dental health represented by higher dental caries severity which might be related to elevated IL-17 level among postmenopausal women. Further studies recommended with larger sample size with other salivary immune factors types measurement.

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Keywords: *Caries experience, salivary intrleukin-17, pre and postmenopausal females.*

1. INTRODUCTION

Menopause means constant stoppage of menstruation at the last reproductive life because of the waste of the follicular activity of the ovary.[1] Menopause must be counted from the last menstruation day, like a short period (an interruption of 12 months)[2] , Ovaries lost their hormonal and reproductive functions permanently. [3] Premenopausal changes refer to the period before menopause, as well as postmenopausal changes refers to the time after menopause , while the perimenopause to the stage around menopause (40-55)[1] However the climacterium means a highly longer time demand a collection of calamities like the absence of women venereal capacity and the release of remarkable changes in gender hormone production.A considerable modifications induced in the genital apparatus due to these calamities and in other parts of the human body[2]. Oral presentations would found preposition to the general marks of menopause, as well as to the physiological progression of the oral tissues, the alterations in hormones that arise in menopausal females are responsible for the change noticed inside the oral cavity. This physiological phenomenon affects the oral tissue at the same manner which it affects the other tissue. The changes in the oral cavity are because of senility and the low productions of estrogen hormone (hypoestrogenism).[4] Histologically, the oral mucosa is look alike vaginal mucosa, and in its reaction to estrogen hormone. In salivary gland and the oral mucosa, the receptors of sex hormone have been reported[5,6] .

IL-17 is a proinflammatory cytokine produced by activated T-cells. An important role has been played by its ligands and receptors in the homeostasis of tissues in health and disease with the immune system Now IL-17 consider as a new inducer of bone loss in postmenopausal osteoporosis, and it represents across link between estrogen deprivation and increased immune reactivit [6]

2. MATERIAL AND METHOD

The whole sample contained ninety (90) females aged 48-52. According to the last birthday we counted their ages (WHO, 1997)[7] We informed them carefully on the aim of the examination and we obtained their permissions. Informed consent and ethical approval had been collected.

In this study, the first group (control group) contained 45 premenopausal women and the second group (study group) contained 45 post-menopausal women who attending Heath care Centers and Collage of Dentistry/ Baghdad University. Bio- chemical laboratory events were done in Poisoning Consultation Center at Gazi Al-Hariri hospital.

Inclusion criteria:

For first group (control group) , all healthy women aged 47-51 with steady menstrual cycle during the last year.

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For second group (study group) , all healthy women aged 47-51 with one year amenorrhea

All females have a good health status with no history of any systemic illness (diabetic mellitus, thyroid malfunction, Auto immune diseases, hysterectomy, ovarian cystic lesion and any sign of early menopause for other cause) or take any medications. All information had taken from their medical records.

According to (WHO,1997).[7] , each females in each group received a total examination of all teeth except wisdom teeth and on all surfaces (lingual/palatal, mesial, distal and buccal/labial) by using dental explorer. According to decayed, missed and filled teeth and decayed, missed, filled surfaces indices and its fractions Decayed S, Missed S, Filled S for permanents teeth), decayed, missing, filled index the caries experience was reported

Saliva collection

At a specific time(8-11 a.m.) , the unstimulated saliva samples were assembled. The participant was told to stop eating and drinking any sustenance except water is accepted, before an hour of the examination time. We asked each participants to be seated on a chair and use distilled water for irrigation and rested at for 5 minutes and settle her head up and to keep the test tube below it and to persist her mouth opened to let the saliva droll and fall into the tube for 5 minutes (Navazesh and Kumar, 2008).[8]

The bio-chemical analysis of saliva:

Salivary interleukin-17 analysis: The salivary interleukin-17 concentration was determined by using the supernatant salivary samples with mean of Enzyme Linked Immune-Sorbent Assay (ELISA). The DEMEDITEC Salivary interleukin-17 ELISA kit (96-wells)

Data processing and statistical analysis: We recorded the data by a personal computer. Statistical analysis was done by using correlation test by the aid of the SPSS version 21 (Statistical Package for Social Sciences).

3. RESULTS

Table (1) illustrated caries experience and its parts (Decayed S, Missed S, DMFS, and DMFT) of study and control group. It was reported that the mean value of the Decayed S, Missed S and DMFS were higher in study group than that of control group and highly significant difference statistically for Decayed Surfaces ($p < 0.01$) and non-significant difference for Missed S and the sum of decayed ,missed and filled Surfaces ($p > 0.05$)

DMFT higher in control group with non-significant difference ($p > 0.05$)

Table 1: *The experience of caries in pre & post-menopausal females (DS, MS, DMFS, DMFT)*

Variables		*Mean*	*±SD*	*Median*	*Mean Rank*	*Z*	*P-value*
Decayed S	Pre	5.289	2.222	5.000	37.99	2.751	.006**
	Post	6.489	2.139	7.000	53.01		
	The total	5.889	2.251	6.000			
Missed S	Pre	31.822	9.439	33.000	44.72	.283	.777
	Post	32.556	9.137	33.000	46.28		
	The total	32.189	9.244	33.000			
Decayed Missed Filled Surfaces	Pre	43.156	9.551	44.000	45.88	.137	.891
	Post	43.311	9.800	44.000	45.12		
	The total	43.233	9.622	44.000			
Decayed Missed Filled Teeth	Pre	13.800	3.130	14.000	45.56	.020	.984
	Post	13.711	3.628	14.000	45.44		
	The total	13.756	3.370	14.000			

*Significant at($p<0.05$)**

***Highly significants at($p<0.01$)*

About the filled surfaces part (FS) for pre and post-menopausal females, T-test was used for statistical analysis and illustrated in the Table 2 , mean value of filled surfaces was higher in control group with highly significant difference ($p < 0.01$).

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Table 2: *The experience of caries FS in control and study group*

Variable		*Mean*	*±SD*	*T*	*df*	*P-value*
Filled S	Pre	6.111	2.347	3.836	88	.000**
	Post	4.244	2.268			
	Total	5.178	2.479			

**Significant at (p < 0.05)*
***Highly significant at (p<0.01)*

Salivary interleukin-17 in this study was higher in postmenopausal females than control group with no significant difference (p<0.01), table (3).

Table 3: *The descriptive and statistical test for salivary IL-17 level among the two groups*

Menopause status	Mean	±SD	Median	Mean Rank	Z	P-value
Pre-menopause	77.589	39.551	84.950	45.84	0.125	0.900
Post-menopause	82.147	28.283	83.779	45.16		NS
Total	79.868	34.265	84.248			

The correlations of interleukin-17 with decayed surfaces, missed surfaces and filled surfaces among control and study group showed a positive highly significant correlation of IL-17 with DS fraction among premenopause (r=0.0393, p=0.008) while the remaining relations were non significance difference (p>0.01).table (4)

Table 4: *The correlation of salivary interleukin-17 level and caries experience by using Spearman correlation.*

Menopause	The Variable	IL	
		r	P-value
Post-menopause	Decayed S	.086	.576
	Missed S	.003	.987
	Filled S	.266	.077
	DMFS	.011	.941
	DMFT	-.015	.921
Pre-menopause	Decayed S	**.393**	**.008****
	Missed S	-.137	.369
	Filled S	.080	.599
	DMFS	-.016	.914
	DMFT	-.189	.213

*** Highly significant (P<0.01)*

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4. DISCUSSION

According to the aim of the current study that was estimating dental caries experience in relation to the IL-17 in postmenopausal and premenopausal women.

Results of the current study showed that caries experience (DS, MS and DMFS) were higher in postmenopausal women as compared to premenopausal women. These results goes in accordance with Yalçın et al., 2005 and Dural et al., 2005 studies as they stated that postmenopausal women revealed higher caries experience (DMFT) as compared to menstruating women. [9,10]

Poor dentition status in postmenopausal women probably related to endocrine disturbances , vitamins and calcium deficiency and numerous psychological factors through menopausal time that increase susceptibility to dental decay. [10]

In addition to hormonal alteration (low estrogen level) that happened in menopausal females are in charge of the alterations noticed within the mouth. [4] This study showed positive correlation for caries experience with salivary interleukin-17, as an influence of hypo-salivation, dry mouth or xerostomia (low secretion of saliva) was a symptom noticed with menopause time (Agha-Hosseini 2009), and the dental decay probability increase with hypo-salivation. [11,12,13]

The above finding are supported by the present study results as the IL-17 level was higher in postmenopausal women as compared to control though with no statistically significant difference.

Such higher level of IL-17 among postmenopausal women might affect dental caries severity through its effect on oral immune system but this need further studies.

Furthermore, highly significant correlation was recorded for IL-17 with decayed surface also this need further studies to explore the relation of IL_17 with dental caries process.

Conclusion: menopause influence female's dental health represented by higher dental caries severity which might be related to elevated IL-17 level among postmenopausal women. Further studies recommended with larger sample size with other salivary immune factors types measurement.

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