



The Impact of Menopause on Dental Caries and Salivary IL-17 Levels

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ARTICLE INFO

Received: 21 Jul 2025,

Revised: 30 Jul 2025,

Accepted: 3 Aug 2025,

Online: 25 Aug 2025

Keywords:

Caries experience, salivary interleukin-17, premenopausal, postmenopausal women.

ABSTRACT

Background: Menopause affects oral tissues similarly to other body systems. **Aim of the Study:** This study aimed to evaluate dental caries experience in relation to salivary interleukin-17 (IL-17) levels among premenopausal and postmenopausal women. **Materials and Methods:** Ninety women aged 46–50 years were divided into two groups: 45 premenopausal (control group) and 45 postmenopausal (study group). Caries experience was recorded using WHO (1997) criteria. Unstimulated saliva samples were collected for IL-17 analysis. **Results:** The postmenopausal group had higher mean values of decayed surfaces, missed surfaces, and DMFS than the premenopausal group. Only the decayed surfaces showed a statistically significant difference ($p < 0.01$). The IL-17 level was also higher in postmenopausal women. **Conclusion:** Menopause may contribute to worsened dental health, reflected in increased caries severity potentially associated with elevated IL-17 levels. Further studies with larger sample sizes and additional salivary immune markers are suggested.

1. Introduction

Menopause refers to the permanent cessation of menstruation due to the depletion of ovarian follicular activity. It is clinically diagnosed after 12 consecutive months without a menstrual period. The perimenopausal stage includes the transition period (typically between ages 40–55), while the postmenopausal stage follows menopause. This transitional period involves significant hormonal shifts, particularly a decline in estrogen, which affects not only the reproductive system but also other body systems including the oral cavity.

Oral manifestations of menopause include dry mouth, burning sensations, and altered taste. The reduction in estrogen levels is believed to contribute to changes in oral mucosa, salivary gland function, and susceptibility to dental caries. IL-17 is a proinflammatory cytokine that plays a role in immune regulation and is considered a potential contributor to postmenopausal bone loss and immune reactivity. Its role in oral health, particularly in relation to caries experience in menopausal women, warrants further investigation.

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doi: [10.5281/jgsr.2025.16941755](https://doi.org/10.5281/jgsr.2025.16941755)

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2. Materials and Methods

This study included 90 women aged between 46 and 50 years, classified into two groups. The control group comprised 45 premenopausal women with regular menstrual cycles, and the study group comprised 45 postmenopausal women who had experienced at least 12 months of amenorrhea. Participants were selected based on good general health with no systemic diseases, surgical history affecting reproductive organs, or medications influencing hormone levels. All participants provided informed consent.

Dental examinations were performed according to WHO guidelines (1997), evaluating all permanent teeth (excluding third molars) using DMFT and DMFS indices. Saliva was collected between 8:00 and 11:00 AM under standardized conditions. Participants refrained from food or drink (except water) for at least one hour before collection.

Unstimulated saliva was gathered over a 5-minute period and analyzed for IL-17 concentration using ELISA (DEMEDIATEC kit). Data were processed using SPSS version 21, and Spearman correlation was used for statistical analysis.

3. Results

The study group (postmenopausal) demonstrated higher mean values for decayed surfaces (DS), missed surfaces (MS), and DMFS compared to the control group. A significant difference was found only in DS ($p < 0.01$). The mean DMFT was slightly higher in the control group but not statistically significant. Filled surfaces (FS) were significantly higher in the premenopausal group ($p < 0.01$). IL-17 levels were elevated in the study group but without statistical significance. A significant positive correlation between IL-17 and DS was noted in the premenopausal group ($p < 0.01$), while other correlations were non-significant.

Table 1: Caries experience among pre and post-menopausal women (DS, MS, DMFS, DMFT)

Variables		Mean	$\pm SD$	Median	Mean Rank	Z	P-value
DS	Pre	5.289	2.222	5.000	37.99	2.751	.006**
	Post	6.489	2.139	7.000	53.01		
	Total	5.889	2.251	6.000			
MS	Pre	31.822	9.439	33.000	44.72	.283	.777
	Post	32.556	9.137	33.000	46.28		
	Total	32.189	9.244	33.000			
DMFS	Pre	43.156	9.551	44.000	45.88	.137	.891
	Post	43.311	9.800	44.000	45.12		
	Total	43.233	9.622	44.000			
DMFT	Pre	13.800	3.130	14.000	45.56	.020	.984
	Post	13.711	3.628	14.000	45.44		
	Total	13.756	3.370	14.000			

Regarding FS fraction for pre-menopausal and post-menopausal women is statically analyzed by T-test and shown in the table (2), the mean value of FS is higher in pre-menopausal group with highly significant difference ($p < 0.01$).

Table 2: caries experience among pre and post-menopausal group (FS)

Variables		Mean	$\pm SD$	T	df	P-value
FS	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 ($p < 0.01$)

Regarding salivary interleukin-17, the present study was found that interleukin-17 in postmenopausal group is higher than control group with no significant difference between the two groups ($p < 0.01$), table (3).

Table 3: Descriptive and statistical test of IL-17 level among groups

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

The correlation for interleukin-17 with caries experience (DS, MS & FS) between two groups revealed negative correlation with no significance difference ($p > 0.05$). Table (4)

Table 4: Correlation between salivary interleukin-17 and caries experience by groups using Spearman correlation

Menopause	Variables	IL	
		r	P-value
Post	DS	.086	.576
	MS	.003	.987
	FS	.266	.077
	DMFS	.011	.941
	DMFT	-.015	.921
Pre	DS	.393	.008
	MS	-.137	.369
	FS	.080	.599
	DMFS	-.016	.914
	DMFT	-.189	.213

4. Discussion

This study revealed that postmenopausal women had increased caries experience, particularly in DS and DMFS, aligning with previous research by Yalçın et al. (2005) and Dural et al. (2005). Hormonal changes, specifically reduced estrogen, may affect salivary composition and quantity, contributing to xerostomia and increased caries risk. Additionally, higher IL-17 levels in postmenopausal women may influence immune responses in the oral cavity, exacerbating caries progression. While IL-17 was not significantly different between groups, its positive correlation

with DS in premenopausal women suggests a possible link that needs further investigation.

5. Conclusion

Menopause appears to impact oral health negatively by increasing caries severity. This may be partially attributed to elevated salivary IL-17 levels. Further research is needed with larger sample sizes and analysis of additional salivary immune biomarkers to clarify this association.

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