

# Modulation of coronary artery disease risk factors by menopausal status: A population based study among Iranian women (KERCADRStudy)

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## BACKGROUND

Menopause is now viewed as a risk factor for coronary heart diseases (CHD). There is a scarcity of evidence concerning the effects of menopause on coronary artery disease (CAD) risk factors. The present study aimed to evaluate the effects of menopausal status on CAD risk factors.

## METHODS

The present study was designed as part of the Kerman coronary artery disease risk study (KERCADRS) that was a population-based study among a cohort of 6000 individuals aged 15 to 75 years in Kerman, Iran. Only women aged 35 to 60 years were enrolled. Participants were categorized according to reproductive age into the three groups of premenopausal, perimenopausal, and postmenopausal states.

## RESULTS

The premenopausal status was accompanied with lower levels of triglyceride (TG), cholesterol, fasting plasma glucose (FPG), and blood pressure compared with the other two groups ( $P < 0.001$ ). In addition, women in the postmenopausal group had higher levels of low-density lipoprotein (LDL) in comparison with the other two groups ( $P < 0.001$ ). After adjusting for age, total cholesterol and LDL levels were significantly higher in the postmenopausal group compared with the other two groups ( $P < 0.05$ ). In addition, total cholesterol and LDL levels, and systolic blood pressure were statistically different according to menopausal status after adjustment for both age and body mass index ( $P < 0.05$ ).

## CONCLUSION

The increased risk of cardiovascular disease in postmenopausal period can be explained by elevated levels of lipid profile and increased systolic blood pressure, regardless of effects of advanced age or other anthropometric parameters.

**Table 1**

Comparison of cardiovascular risk factors according to menopausal status

Characteristics	Premenopausal (n = 931)	Perimenopausal (n = 84)	Postmenopausal (n = 523)	P
Family history of CAD	212 (22.8)*	20 (23.8)	154 (29.4)	0.005
Hypertension	89 (9.6)	15 (17.9)	117 (22.4)	< 0.001
Hyperlipidemia	69 (7.4)	17 (20.2)	138 (26.4)	< 0.001
Diabetes mellitus	14 (1.5)	3 (3.6)	18 (3.4)	0.017
Current smoking	80 (8.6)	9 (10.7)	38 (7.3)	0.384

\*N (%)

Comparing was performed by the ANOVA test; CAD: Coronary artery disease

**Table 2**

Comparison of age-adjusted means of coronary heart diseases (CHD) risk factors according to menopausal status

	Premenopausal (n = 931)	Perimenopausal (n = 84)	Postmenopausal (n = 523)	Unadjusted P	Age-adjusted P	Age and BMI adjusted P
BMI (kg/m <sup>2</sup> )	27.9 ± 4.7*	27.8 ± 4.6	28.5 ± 5.0	0.077	0.458	0.444
Waist circumference (cm)	85.0 ± 11.1	88.6 ± 11.0	89.2 ± 11.7	< 0.001 <sup>a,c</sup>	0.578	0.014 <sup>c</sup>
Systolic blood pressure (mmHg)	112.7 ± 17.3	126.0 ± 20.8	125.7 ± 20.5	< 0.001 <sup>a,c</sup>	0.070	0.025 <sup>c</sup>
Diastolic blood pressure (mmHg)	75.8 ± 9.5	80.6 ± 10.7	80.9 ± 10.8	< 0.001 <sup>a,c</sup>	0.186	0.073
Fasting glycemia (g/dl)	100.4 ± 34.3	113.7 ± 51.6	117.8 ± 55.2	< 0.001 <sup>a,c</sup>	0.504	0.478
Total cholesterol (mg/dl)	197.2 ± 37.9	209.3 ± 43.6	219.3 ± 47.2	< 0.001 <sup>a,c</sup>	< 0.001 <sup>a</sup>	< 0.001 <sup>a</sup>
LDL cholesterol	129.1 ± 31.7	133.7 ± 32.5	144.3 ± 39.4	< 0.001 <sup>a,a</sup>	< 0.001 <sup>a</sup>	< 0.001 <sup>a</sup>
HDL cholesterol	39.9 ± 10.9	39.6 ± 10.6	40.4 ± 9.2	0.663	0.791	0.788
Triglycerides	143.7 ± 79.1	167.7 ± 79.9	170.5 ± 87.9	< 0.001 <sup>a,c</sup>	0.166	0.110

\*Mean ± SD

<sup>a</sup>P < 0.05 for postmenopausal vs. premenopausal

<sup>b</sup>P < 0.05 for postmenopausal vs. perimenopausal

<sup>c</sup>P < 0.05 for perimenopausal vs. premenopausal

Comparisons were performed by ANOVA test followed by Tukay's post-hoc analysis; CHD: Coronary heart diseases; BMI: Body Mass Index; LDL: Low density lipoprotein; HDL: High density lipoprotein

