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ORIGINAL ARTICLE

Assessment of Framingham Risk Score and Systemic Coronary Risk Evaluation in Rosacea Patients☆

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ABSTRACT

Background/Objective(s): Although some studies with contrary results have been reported, recent studies suggest an association between rosacea and cardiovascular diseases. However, no study has investigated the frequency of cardiovascular risk in rosacea patients using a validated scale. We aimed to determine the frequency of cardiovascular risk by the Framingham Risk Score (FRS) and Systemic Coronary Risk Evaluation (SCORE) in rosacea patients.

Methods: We conducted a case–control study including 85 rosacea patients and 90 controls. Demographic information, rosacea duration (obtained by self-report of the patients) and subtype, smoking history, lipid parameters, blood pressure, use of antihypertensive drug, fasting blood glucose, body mass index, family history of coronary artery disease, presence of metabolic syndrome and insulin resistance, and total points of the FRS and SCORE were recorded.

Results: Eighty-five rosacea patients (65 females and 20 males; mean age, 50.63 years) and 90 controls (67 females and 23 males; mean age, 50.79 years) were included in the study. Of the 85 rosacea patients, 44 had the erythematotelangiectatic type and 41 had the papulopustular type. The mean SCORE and FRS levels were not significantly different between the rosacea and control groups. Ten patients (12.5% vs. 11.8%) were estimated to be at high risk by both the SCORE and FRS models. The SCORE levels correlated with the rosacea duration. The patients with the papulopustular type had significantly higher cardiovascular risk than those with the erythematotelangiectatic type.

Conclusion: Rosacea patients did not have an increased risk of cardiovascular disease, as estimated by the two validated models. However, further studies are needed with the four subtypes of rosacea to evaluate cardiovascular risk factors separately.

Introduction

Rosacea is a relatively common skin disease, which has been associated with cardiovascular diseases and gastrointestinal diseases recently.[1–3] Since Duman et al[1] reported that cardiovascular risk factors are increased in rosacea, diverse studies with contrasting results have been published. Among the various cardiovascular risk factors, total cholesterol, low-density lipoprotein, C-reactive protein, smoking, and alcohol consumption have been found to be increased in rosacea patients.[1] In a study by Hua et al,[4] dyslipidemia and hypertension have been shown to be increased in these patients. In contrast to these studies supporting high cardiovascular risk in rosacea patients, some studies have reported that no increased risk of death exists due to cardiovascular events in rosacea patients.[2,5]

Cardiovascular disease risk increases proportionally with the increase in numbers of risk factors and can be predicted based on the presence of some risk factors together. At the present time,

☆ Rosacea has been associated with cardiovascular diseases recently. To our knowledge, no study has investigated the frequency of cardiovascular risk in rosacea patients using a validated scale. We, therefore, aimed to determine the frequency of cardiovascular risk by Framingham Risk Score and Systemic Coronary Risk Evaluation in rosacea patients.

Conflicts of interest: The authors have no conflicts of interest to declare.

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various cardiovascular risk models have been used to calculate the total cardiovascular risk. The Framingham Risk Score (FRS) and Systemic Coronary Risk Evaluation (SCORE) are the frequently used cardiovascular risk models for calculating cardiovascular risk. These tools classify risks from low to high.[6,7] To the best of our knowledge, no study has investigated the frequency of cardiovascular risk in rosacea patients using a validated scale.

We aimed to determine the frequency of cardiovascular risk by the FRS and SCORE models in rosacea patients in comparison with controls.

Materials and methods

We conducted a case–control study including 85 rosacea patients and 90 controls at the Department of Dermatology of Mugla Sitki Kocman University Training and Research Hospital between January 2015 and November 2016. Ethic Committee approval was obtained from the local hospital Ethic Committee. Rosacea patients and controls who meet the inclusion/exclusion criteria were enrolled in the study consecutively. Diagnosis of rosacea was based on the National Rosacea Society criteria by a single dermatologist. Controls were selected from the age-, sex-, and body mass index (BMI)-matched patients who were admitted the hospital with various dermatological problems except rosacea. Exclusion criteria for the two groups were presence of a known cardiovascular disease, peripheral vascular disease, diabetes mellitus, and any other inflammatory disease.

Demographic information, rosacea duration (obtained by self-report of the patients) and subtype, smoking history, lipid parameters, blood pressure levels, use of antihypertensive drug, fasting blood glucose, BMI, family history of cardiovascular disease, and presence of metabolic syndrome and insulin resistance were systematically recorded. All biochemical blood parameters were studied after a 12-hour fasting period. BMI was calculated using the following formula: weight (kg)/height^2 (m^2). Diagnosis of metabolic syndrome was based on the criteria of the International Diabetes Federation (IDF-2005).[8] The homeostasis model assessment of insulin resistance was used to calculate insulin resistance according to the following formula: fasting insulin level (μIU/mL) × fasting blood glucose level (mg/dL)/405. A value >2.7 was considered to indicate insulin resistance.

The FRS of each participant was calculated using the ATP III charts and a 10-year fatal or nonfatal cardiovascular risk of the participants was classified into three groups: low risk (<10%), intermediate risk (10–20%), and high risk (>20%).[7] The SCORE of each participant was calculated using the Turkish Society of Cardiology charts and the cardiovascular risk of the participants was classified into two groups: low intermediate risk (<5%) and high risk (≥5%).[9]

The statistical program SPSS for Windows 22.0 (SPSS Inc., Chicago, IL, USA) was used for statistical analysis of the study data. Mean, standard deviation, ratio, and frequency were used for the descriptive statistics. After checking for distribution of variables with the Kolmogorov–Smirnov test, independent samples *t* test and Mann–Whitney *U* test were performed for variables distributed normally and non-normally, respectively. The Chi-square test was used for the categorical data. All *p* values < 0.05 were assessed as significant.

Results

Eighty-five rosacea patients (65 females and 20 males; age range, 35–74 years; mean, 50.63 years) and 90 controls (67 females and 23 males; age range, 35–78 years; mean, 50.79 years) were included in the study. Of the 85 rosacea patients, 44 (51.8%) had erythematotelangiectatic-type and 41 (48.2%) had papulopustular-type rosacea. The duration of rosacea ranged from 3 months to 20 years (mean, 3.52 years). Sixty-three patients (74.1%) had rosacea on the central face, one (1.2%) on the chin, seven (8.2%) on the cheek, and 14 (16.5%) throughout the face.

Five patients in the rosacea group and eight patients in the control group were not included in the statistical analysis of the SCORE model because they were under 40 years. The mean SCORE and FRS levels were not significantly different between the rosacea and control groups ($p < 0.05$). After the SCORE levels were divided into two groups (low-moderate risk and high risk) and the FRS levels were divided into two groups (low risk and moderate-high risk), there was no significant difference between the groups ($p < 0.05$). Ten patients (12.5%) were at high risk, as estimated by the SCORE model, and another 10 patients (11.8%) were at moderate-high risk, as estimated by the FRS model. However, the rosacea group had significantly high C-reactive protein, systolic blood pressure, and diastolic blood pressure levels ($p < 0.05$; Table 1). In addition, the SCORE levels were correlated with the rosacea duration after adjusting for age ($p = 0.034$).

Because the risk of cardiovascular diseases increases in women after menopause, we divided the female participants into two groups, according to the mean menopause age (47 years) in Turkey.[10] The mean SCORE and FRS levels were not significantly different between the rosacea and control groups in the premenopausal and postmenopausal periods ($p < 0.05$) (Table 2).

When we compared cardiovascular risk factors in patients with erythematotelangiectatic-type and papulopustular-type rosacea, the patients with the papulopustular-type rosacea had significantly higher risk estimated by the SCORE model, moderate-high risk estimated by the FRS model, and high systolic blood pressure ($p > 0.05$). In addition, the mean SCORE level was significantly

Table 1 Comparison of the demographic, clinical, laboratory, and cardiovascular risk score characteristics in the rosacea and control groups.

	Rosacea group ($n = 85$) n (%)/mean ± SD	Control group ($n = 90$) n (%)/mean ± SD	p
Age (y)	50.63 ± 8.45	5.79 ± 9.02	0.993
Smoking	9 (10.6)	16 (17.8)	0.174
Alcohol consumption	5 (5.9)	6 (6.7)	0.831
Regular exercise	27 (31.8)	40 (44.4)	0.085
BMI (kg/m^2)	28.07 ± 3.45	27.50 ± 3.47	0.285
LDL (mg/dL)	129.56 ± 31.58	121.91 ± 25.43	0.078
Triglyceride (mg/dL)	135.39 ± 70.31	117.23 ± 54.49	0.103
Total cholesterol (mg/dL)	212.71 ± 36.27	204.14 ± 33.53	0.107
HDL (mg/dL)	55.91 ± 13.79	57.59 ± 16.47	0.641
FBG (mg/dL)	96.71 ± 14.27	93.56 ± 9.05	0.429
CRP (mg/dL)	3.35 ± 3.31	2.33 ± 2.13	**0.015**
High systolic BP	29 (34.2)	17 (18.9)	**0.017**
High diastolic BP	27 (31.8)	19 (11.1)	**0.001**
Family history of CAD	13 (15.3)	20 (22.2)	0.273
Insulin resistance	30 (35.3)	21 (23.3)	0.082
Metabolic syndrome	28 (32.9)	21 (23.3)	0.157
Mean SCORE	1.95 ± 2.95	2.21 ± 3.57	0.89
SCORE			0.763
Low-moderate risk	70 (87.5)	73 (89.1)	
High risk	10 (12.5)	9 (10.9)	
Mean FRS	3.09 ± 4.52	2.84 ± 4.31	0.903
FRS			0.373
Low risk	75 (88.2)	83 (92.2)	
Moderate-high risk	10 (11.8)	7 (7.8)	

Data were analyzed using the Chi-square, independent samples *t*, and Mann–Whitney *U* tests.

BMI = body mass index; BP = blood pressure; CAD = coronary artery disease; CRP = C-reactive protein; FBG = fasting blood glucose; FRS = Framingham Risk Score; HDL = high-density lipoprotein; LDL = low-density lipoprotein; SCORE = Systemic Coronary Risk Evaluation; SD = standard deviation.

The *p* values < 0.05 were assessed as statistically significant, they were presented in bold.

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