

«Original Articles »

Association of Rose angina with cardiovascular risk factors among men and women: a population-based study

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Abstract

Background: Rose angina increased the risk of coronary heart disease and death. This research was designed to determine the prevalence of Rose angina and its relationship with cardiovascular risk factors.

Material and methods: In this cross-sectional study, persons with 30 years old or older were participated in Jahrom. Rose angina was assessed with Rose questionnaire. Fasting blood lipids and sugar, blood pressure, weight and height were measured. Data were analyzed by chi squared and logistic regression tests.

Results: The prevalence of Rose angina was 21.1%. Women had Rose angina 12.4% more than men (26.5% in women, 14.3% in men; $p < 0.001$). Logistic regression results showed that there was an association only between obesity (OR=1.72; CI 95%:1.07-2.74) and type 2 diabetes mellitus (OR=2.19; CI 95%: 1.24-3.87) among women and Rose angina.

Conclusion: Rose angina was higher in women with overweight or obesity and diabetes mellitus. Therefore, regarding to the high prevalence of Rose angina should be paid more attention to cardiovascular disease and preventable risk factors seem to be necessary.

Keywords: risk factor, rose angina, rose questionnaire, gender

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Introduction

In 1962, Rose introduced an administered questionnaire for determining the prevalence of chest pain that named Rose Questionnaire (1). This questionnaire is used for determining of natural history of ischemic heart disease (2), interventional response (3) and to comparing of populations (4). Also, Haywood et al suggested that RQ can predict myocardial infarction after hospital admission (5).

Several investigations have been shown that Rose angina increased risk of coronary artery disease and mortality (6-8). Also, Lampe et al were showed that the relative risk of a major ischemic heart disease event were 2.03 for angina compared to no chest pain (9). In another study that subjects aged 40-49 years followed for 23 years, the Rose angina implied an elevated mortality from coronary heart disease (1.5 in men and 1.98 in women) (6). In another study, men with angina had much higher prevalence rates of ischemic heart disease abnormalities on electrocardiogram than men with no chest pain (10). In a cohort study (10 years) in Iran showed that RQ is a powerful predictor of coronary heart disease events in Iranian men and women (11).

Pakhomov et al (2005) showed an association between chest pain and low serum level of high-density lipoprotein (12). Also, the risk of coronary artery calcification was significantly higher in men and women with Rose angina in compared to subjects without angina (13). In another study, women with Rose angina had a poorer cardiovascular risk factors such as degree of obesity, serum cholesterol and blood pressure (14) and serum level of HDL cholesterol (15).

According to importance of Rose angina for prediction of cardiac events and its association with risk factors and dependency of risk factors with lifestyle and different lifestyle of subjects in divers community, the aim of study was epidemiologic survey of Rose angina in

urban population of 30 years and over and association of Rose angina with cardiovascular risk factors.

Material and methods

This was a cross-sectional study as "prevalence of ischemic heart disease and cardiovascular risk factors in an urban population aged 30 years and over" in Jahrom during 2009-2010. One thousand subjects selected with cluster random sampling and were invited to participate in study and attend a Paymanie hospital. Totally, 892 subjects participated. Then recipients were asked to complete a questionnaire including demographic data and tobacco use. The Rose questionnaire was filled in by a physician. Height, weight and blood pressure was measured. A fasting blood sample after 8-10 hours overnight fast was obtained for fasting blood sugar and serum lipids measurement from the all subjects. Pregnant and lactating women and/or persons with chronic disease and mental disorders and unable to walk, were excluded.

The chest pain was assessed with RQ that is valid and reliable (16) and validity and reliability of its Persian version was concluded (17). Definite angina was defined according to standard criteria as chest pain or discomforts which: 1- was brought on by exertion, 2- was situated in the central or left anterior chest, 3- forced the subject to slow down or stop, 4- was relieved if the subject did so and 5- was relieved within 10 min (9). Possible angina was defined as chest pain brought on by exertion, but not fulfilling all of the four additional criteria for definite angina. Subjects with history of myocardial infarction and or was done open heart surgery or coronary angioplasty included in definite angina group.

The measurements for weight, height, blood pressure, fasting blood glucose and serum lipids have been reported previously (18, 19). Body mass index (BMI) was calculated by weight (kg) divided by

height (m) squared (20). Obesity defined as a BMI of ≥ 30 kg/m² and overweight, as a BMI 25-30. According to JNC-VII criteria, hypertension was diagnosed when the systolic blood pressure was ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg or use of antihypertensive medication (21). Smoking status was ascertained by means of a questionnaire. Subjects, who smoked one or more cigarettes or one cup of water pipe per week, were considered as smokers. Lipid disorders was defined according to Third Report of the National Cholesterol Education Program Adult Treatment Panel III (NCEP-ATPIII) (22). According to American Diabetes Association (23), diabetes was defined as fasting blood sugar ≥ 126 mg/dl for two times or use of oral hypoglycemic agents.

Subjects with three or more of the following five risk factors of the criteria of the modified NCEP III definition (22) were defined as having metabolic syndrome: (a) triglyceride ≥ 150 mg/dl, (b) HDL cholesterol < 40 mg/dl in men and < 50 mg/dl in women, (c) systolic blood pressure ≥ 130 mmHg or diastolic blood pressure ≥ 85 mmHg, (d) fasting plasma glucose ≥ 100 mg/dl and (e) waist circumference ≥ 102 cm for men, ≥ 88 cm for women. But we used BMI as substitute of waist circumference.

Data were recorded by SPSS, versions 11.5. Qualitative variables were presented as frequency and quantitative variables were presented as mean \pm standard deviation. The chi squared test was used to compare the proportions between groups and the logistic regression test was used to associate the variables with Rose angina in total and both genders. Two tailed $p < 0.05$ was considered to be statistically significant.

Results

The majority of (487, 54.6%) of participants were women and 40-49 years old (258, 28.9%). Twenty two (2.4%) persons had previous history of myocardial infarction and for 23 (2.5%) persons was done revascularization such as coronary artery bypass or angioplasty.

Rose angina was presented in 188 (21.1%) and women had 12.4% more than men (26.5% in women and 14.3% in men; $p < 0.001$). Definite angina was presented in 41 (10.1%) men and 83 (17%) in women. Also, the prevalence of possible angina was 4.2% (17) in men and 9.7% (47) in women.

The prevalence of Rose angina in men and women was shown in Table 1. The prevalence of angina was higher in women with aged under and over 50 years, overweight or obesity and diabetes, hypertension, hypertriglyceridemia, hypercholesterolemia, high LDL-C, low HDL-C and metabolic syndrome in compare to men. Although, the prevalence of Rose angina were 4.2% more in smoked men than in smoked women, but this different was not statistically significant. Also, the prevalence of Rose angina was insignificantly higher in women with hypercholesterolemia than in men.

The association of Rose angina with studied variables in participants and in men and women was shown in Table 2. The most power risk factor was sex in participants. Thus women had 2.11 fold risk of angina more than men (OR = 2.11, CI: 1.48-3.0). Also, overweight or obesity and age of 50 years and over were significantly associated with angina. In women the most important risk factors were diabetes mellitus and overweight or obesity that they in order to increased 2.19 and 1.72 fold risk of angina. But Rose angina was no significant association to studied variables in men.

Table 1 compare frequency (%) of Rose angina to studied variables in men and women

Variables	Rose angina			P
	Male	Female	Total	
Age < 50 years old	23 (11.6)	68 (23.6)	91 (18.7)	< 0.001
Age ≥ 50 years old	35 (17.0)	62 (31.2)	97 (24.0)	0.001
Overweight or obesity	31 (15.0)	99 (29.4)	130 (23.9)	< 0.001
Smoking	18 (16.7)	1 (12.5)	19 (16.4)	> 0.05
Diabetes mellitus	8 (17.8)	24 (40.7)	32 (30.8)	0.010
Hypertension	25 (17.6)	50 (28.9)	75 (23.8)	0.019
High triglyceride	11 (13.8)	21 (26.6)	33 (20.1)	0.044
Hypercholesterolemia	5 (13.2)	16 (24.6)	21 (20.4)	> 0.05
High LDL-C	2 (7.7)	14 (29.2)	16 (21.6)	0.032
Low HDL-C	18 (13.7)	72 (28.8)	90 (23.6)	0.001
Metabolic syndrome	15 (15.0)	43 (27.4)	58 (22.6)	0.021

Table 2 relation of Rose angina and studied variables in men and women with logistic regression

Variables	All subjects			
	OR (CI 95%)	P	OR (CI 95%)	P
Sex, women	2.11 (1.48-3.0)	< 0.001	-----	-----
Age ≥ 50 years	1.45 (1.03-2.04)	0.033	-----	-----
Overweight or obese	1.44 (1.01-2.06)	0.043	1.72 (1.07-2.74)	0.023
Diabetes mellitus	-----	-----	2.19 (1.24-3.87)	0.007

Variables enter in first stage of logistic regression: age group, overweight or obesity, smoking, hypertension, diabetes mellitus, high triglyceride, hypercholesterolemia, low HDL-C, high LDL-C, metabolic syndrome

Discussion

In our study, the prevalence of Rose angina was more than studies conducted in Ghazvin (24), Tehran (25), England (14) and Scotland (26). Also, Owen-Smith et al (1994-1995) reported the prevalence of Rose angina of 7.4% that was lower than our study (27). But Fishbacher et al (1993-1997) reported that the prevalence of Rose angina was few more than our study (24.6%) (28). In our study, similar to other studies (24, 28), the prevalence of Rose angina was more in women than in men. In a meta-analysis of 74 studies reported from 31 countries, the prevalence of Rose angina was higher in women than in men (29). But, some researchers reported a similar prevalence of Rose angina in women and men (2, 12, 26). The one of cause of more prevalence in women maybe was the conditions that had similar

symptoms. Especially in women, anxiety disorders commonly caused chest pain.

The findings of our study showed the Rose angina was associated with higher age, sex and higher weight. The most important factor was gender. In one Iranian study, investigators was shown the association of angina with sex, smoking, diabetes mellitus and hypertension, but age, obesity, hypercholesterolemia and HDL-C was not associated to Rose angina (30). In a cohort study, on 2629 subjects aged 45-74 years, results showed the increased risk of cardiovascular disease in subjects with diabetes mellitus and prehypertension (31). Also in another study, the age ≥ 40 years, diabetes mellitus and family history of ischemic heart disease was associated with coronary artery disease (32).

In our study, higher weight and diabetes was significantly associated with Rose

angina only in women, but such an association was not observed in men. This is compatible with study Japan, showing diabetes mellitus as a risk factor for cardiovascular disease (33). Nicholson et al in their study showed that women with Rose angina had higher serum cholesterol and blood pressure than women without Rose angina (14). Wilkosky et al in her study reported an inverse powerful association between Rose angina and HDL-C in both women and men (15). In a study that was done on 1991 Indian women and men aged 25-64 years, the coronary artery disease was related to age, high cholesterol level, hypertension and abdominal obesity in both gender and related to smoking and obesity in men (2). Also in a study conducted by Morphy et al, the Rose angina was related to age and systolic hypertension in men and to age, BMI and systolic and diastolic blood pressure in women (26). In study by Vaidya et al on men aged 30 years, the cardiovascular disease was significantly associated to age, tobacco smoking and hypertension (34). Our study has several limitations. This study is limited by the cross-sectional

nature of the data, which provides no indication of the direction of effect or causality. Also, angina was not correctly documented. Another limitation is existence of anxiety disorders that it may present in subjects with symptoms such as chest pain.

In conclusion, our study showed that the Rose angina is directly related to sex, age and weight in total participants and to weight and diabetes mellitus in women. Therefore, educational programs by health workers should focus on reducing weight and complications of diabetes mellitus.

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