



Gender Differences in Quality of Life after Percutaneous Coronary Intervention

Sahakyan Y.A.

Department of Internal Diseases No. 2, Yerevan State Medical University, Yerevan, Armenia

Abstract

Coronary artery disease is the leading cause of morbidity and mortality throughout the world. Along with more traditional clinical outcomes in patients with coronary artery disease, health related quality of life differs by gender as well. This study assessed gender differences in quality of life 3 years after the percutaneous coronary intervention in Armenian population.

The study utilized an observational, retrospective cohort design. The study included all patients with coronary artery disease, who underwent percutaneous coronary intervention from 2006 to 2008 at "Nork – Marash" Medical Center. The quality of life was evaluated by an interviewer, who administered SF-12 Questionnaire.

Among 444 participants involved in the analysis, 385 (86.7%) were men. On average, women were older, more hypertensive, more obese, and had significantly higher rates of diabetes. The quality of life analysis showed that women had worse scores in all 8 domains of the Questionnaire. The physical composite scores of women versus men were 37.0 ± 11.3 compared to 43.8 ± 10.7 and mental composite scores were 40.8 ± 11.1 versus 46.8 ± 10.6 , respectively ($p < 0.001$).

The analysis demonstrated that quality of life scores in women are worse than those of men in both physical and mental components.

Keywords: coronary artery disease, percutaneous coronary intervention, quality of life, gender analysis.

INTRODUCTION

Coronary heart disease (CAD) is the leading cause of morbidity and mortality both among men and women throughout the world [WHO, 2011]. Although, historically it was considered to be a "man's disease" by manifesting earlier in man's life, recent studies showed that more females die from the CAD than males [Shu W. et al., 2007; Duvernoy C. et al., 2010]. Gender differences exist in CAD risk factors, manifestation of symptoms, management, and outcome. Generally, women have more existing risk factors such as older age, obesity, hypertension, diabetes, and congestive heart failure [Blomkalns A. et al., 2005; Dotevall A. et al., 2005; Duvernoy C. et al., 2010]. However, men have higher prevalence of smoking, previous history of myocardial infarction (MI), percutaneous coronary intervention (PCI) and coronary artery bypass surgery (CABS) compared to women in the same age group [Berger J. et al., 2006].

Address for correspondence:

Department of Internal Diseases No. 2
Yerevan State Medical University after M. Heratsi
2 Koryun Street, 0025, Yerevan, Armenia
Tel.: (+374) 91501726
E-mail: evasahak@yahoo.com

Along with more traditional clinical outcomes in patients with CAD, health related quality of life (QoL) evaluated by presence of depression, anxiety and general health, differs by gender as well. Two studies reported that women with acute MI have higher level of depression, poorer psychosocial and general health in comparison with men [Schumaker S. et al., 1997; Westin L. et al., 1999]. The Danish Multicenter Randomized Study on Thrombolytic Therapy versus Acute Coronary Angioplasty in Acute Myocardial Infarction (DANAMI 2) evaluated health related QoL between genders after 12 months of PCI in patients with MI. It utilized the SF 36 validated questionnaire, which evaluated 8 domains of health status (physical functioning, role limitations due to physical problems, bodily pain, general health vitality, social functioning and role limitations due to emotional problems), and 2 summary scales (mental and physical composite scores) [Bjorner J. et al., 1998]. The study found that women reported lower scores in all 8 domains and in the summary scores than men [Mortensen O. et al., 2007].

The burden of CAD in Armenia is significant as

in the most of the world. According to the World Health Organization (WHO) statistics, in Armenia in 2004 the proportionate mortality in adult population from CAD in women was higher than in men: 37.0% versus 35.2% [WHO, 2010].

To our knowledge, no study has explored a link between gender and QoL outcomes in patients with PCI in Armenia. Thus, this study assessed gender differences and QoL outcomes of PCI patients. Specifically, the study:

- Assessed sex differences in baseline characteristics upon admission;
- Assessed gender differences in the QoL (assessed by the SF-12) within 3-5 years follow-up at the “Nork–Marash” Medical Center (NMMC) in Armenia.

MATERIAL AND METHODS

The study utilized an observational, retrospective cohort design. The study enrolled all patients with CAD that had PCI intervention at NMMC from January 1, 2006 to December 31, 2008. Patients with missing contact information, missing medical records, outside of Armenia at the time of study and those, who did not speak Armenian, were excluded.

Patient contact information was abstracted from the NMMC PCI dataset for the specified time interval. Telephone surveys were conducted to evaluate patients’ QoL. It was measured by an interviewer-administered SF-12 Questionnaire [Ware J. et al., 2001]. It measured 8 domains of health status (physical functioning, role limitations due to physical problems, bodily pain, general health vitality, social functioning and role limitations due to emotional problems) and assessed 2 summary scales (mental and physical composite scores) as well.

The study protocol was approved by the NMMC Administrative Board and by the Institutional Review Board/Committee on Human Research (IRB) within the College of Health Sciences at the American University of Armenia.

Continuous variables were presented as means and standard deviations and compared by the Student *t*-test; categorical variables were presented as counts and percentages and compared by the Chi-square test. All statistical analyses were performed using Stata10 software package (StataCorp 2007. Stata Statistical Software: Release 10. College Station, TX: StataCorp LP).

RESULTS AND DISCUSSION

Overall, 894 patients underwent PCI from 2006 to 2008 at NMMC, of whom 839 were residents of Armenia. Of those 839 patients, 315 were not available for contact because of different reasons: current residence out of the country, wrong phone numbers, no responders, contact numbers not provided, etc.

Among the 524 patient households contacted by phone, 38 patients had died and 23 refused to participate. Six cases were ineligible. Medical records were not found for 13 patients. The sample available for analysis was 444, among which 385 (86.7%) were male.

Patients’ baseline characteristics stratified by sex is presented in Table 1. On average, women were 5 years older than men, more hypertensive, more obese, and had significantly higher rates of diabetes.

Table 1.

Baseline characteristics of patients

Patient characteristics	Men (n = 388)	Women (n=59)	P value
Risk factors and comorbidities			
Age (years), mean±sd	54.4±9.4	59.7±8.6	<0.01
Current smoker	241 (62.1%)	4 (6.7%)	<0.01
Diabetes	53 (13.6%)	20 (33.9%)	<0.01
Hypertension	270 (69.6%)	51 (86.4%)	<0.01
BMI (kg/m ²), mean±sd	28.6± 4.1	30.4 ±5.3	<0.01
Stroke/TIA	32 (8.2%)	7 (11.8%)	0.26
Renal failure	2 (0.5%)	0 (0.0)	0.49
Cardiac Status			
Acute MI	133 (34.2%)	10 (16.9%)	0.03
Prior MI	139 (35.8%)	16 (27.1%)	0.10
Unstable angina	174 (44.8%)	33 (55.9%)	0.18
Stable angina	51 (13.1%)	15 (25.4%)	0.02
EF, mean±sd	45.0±7.0	47.0±7.0	<0.01
Arrhythmia	53 (13.6%)	10 (16.9%)	0.59

Notes: BMI: body mass index; EF: ejection fraction; MI: myocardial infarction; PCI: percutaneous coronary intervention; TIA: transient ischemic attack; sd: standard deviation.

Table 2.

Evaluation of Quality of life by SF 12

SF 12 Domain & items	Men n (%)	Women (%)	P value
General health			
Excellent	14 (3.65)	0 (0.00)	0.02
Very Good	37 (9.64)	1 (1.69)	
Good	220 (57.29)	29 (49.15)	
Fair	4 (24.48)	20 (33.90)	
Poor	919 (4.95)	9 (15.25)	
Limitation of daily activities			
Moderate activities			
Limited a lot	79 (20.52)	24 (40.68)	0.001
Limited a little	143 (37.14)	23 (38.98)	
Not limited at all	163 (42.34)	12 (20.34)	
Climbing several flights of stairs			
Limited a lot	98 (25.45)	27 (45.76)	0.001
Limited a little	144 (37.40)	25 (42.37)	
Not limited at all	142 (36.88)	7 (11.86)	
Role of emotional limitation			
Accomplished less than you would like			
All of the time	12 (3.13)	7 (12.07)	0.02
Most of the time	41 (10.70)	9 (15.52)	
Some of the time	75 (19.58)	12 (20.69)	
A little of the time	71 (18.54)	15 (25.86)	
None of the time	184 (48.04)	15 (25.86)	
Didn't do work or other activities as carefully as usual			
All of the time	7 (1.83)	8 (13.79)	< 0.001
Most of the time	34 (8.90)	8 (13.79)	
Some of the time	57 (14.92)	11 (18.97)	
A little of the time	78 (20.42)	15 (25.86)	
None of the time	206 (53.93)	16 (27.59)	
Bodily pain			
Not at all	150 (39.06)	16 (27.59)	0.015
A little bit	96 (25.00)	9 (15.52)	
Moderately	77 (20.05)	16 (27.59)	
Quite a bit	48 (12.50)	11 (18.97)	
Extremely	13 (3.39)	6 (10.34)	

SF 12 Domain & items	Men n (%)	Women (%)	P value
Vitality			
Did you have a lot of energy?			
All of the time	41 (10.70)	1 (1.72)	0.001
Most of the time	101 (26.37)	7 (12.07)	
Some of the time	124 (32.38)	17 (29.31)	
A little of the time	81 (21.15)	24 (41.38)	
None of the time	36 (9.40)	9 (15.52)	
Social functioning			
How much physical health or emotional problems interfered with your social activities?			
All of the time	19 (4.96)	14 (24.14)	< 0.001
Most of the time	38 (9.92)	7 (12.07)	
Some of the time	55 (14.36)	11 (18.97)	
A little of the time	75 (19.58)	8 (13.79)	
None of the time	196 (51.17)	18 (31.03)	
Mental health			
Have you felt calm and peaceful?			
All of the time	48 (12.53)	2 (3.45)	0.147
Most of the time	111 (28.98)	17 (29.31)	
Some of the time	120 (31.33)	16 (27.59)	
A little of the time	73 (19.06)	17 (29.31)	
None of the time	31 (8.09)	6 (10.34)	
Have you felt downhearted and depressed?			
All of the time	30 (7.83)	7 (12.07)	0.039
Most of the time	52 (13.58)	12 (20.69)	
Some of the time	111 (28.98)	23 (39.66)	
A little of the time	133 (34.73)	12 (20.69)	
None of the time	57 (14.88)	4 (6.90)	
Role of physical limitation			
Accomplished less than you would like			
All of the time	31 (8.07)	15 (25.86)	< 0.001
Most of the time	41 (10.68)	14 (24.14)	
Some of the time	72 (18.75)	8 (13.79)	
A little of the time	80 (20.83)	8 (13.79)	
None of the time	159 (41.41)	13 (22.41)	
Were limited in the kind of work or other activities			
All of the time	30 (7.81)	14 (24.14)	< 0.001
Most of the time	45 (11.72)	13 (22.41)	
Some of the time	74 (19.27)	13 (22.41)	
A little of the time	77 (20.05)	9 (15.52)	
None of the time	158 (41.15)	9 (15.52)	

Table 3.
Mental and physical composite scores

Composite scores	Men (n=419)	Women (n=66)	P value
Physical	43.8±10.7	37.0±11.3	<0.001
Mental	46.8±10.6	40.8±11.1	<0.001

Notes: *Results are presented as means ± SD.

A higher proportion of men were smokers, had a history of previous MI. At admission, men presented with acute MI more frequently than women.

The analysis of SF 12 Questionnaire by item showed that at the end of the follow-up women provided significantly worse responses in 11 out of 12 items (Table 2). Particularly, the role of physical limitations was more apparent among women. The analysis of composite scores also demonstrated statistically significant differences in both physical and mental scores, indicating worse scores for women (Table 3). Those data were consistent with results of another study, where the inferior QoL score for women persisted even after adjusting for age and clinical and psychosocial comorbidities [Norris C. et al., 2008]. This is indicating that the gender is an independent predictor of QoL in patients with CAD after PCI.

The significant difference between genders in QoL analysis in the present study may be also due to differential misclassification; all patients, who developed stroke, were men and two of them were not interviewed because of disabilities, including impaired speech function. Further analyses will be needed to compare adjusted QoL between men and women.

CONCLUSION

Summarizing the result of the current study, we can conclude that in Armenian population men and women with CAD demonstrated different scores of quality of life (QoL) in 3 years after percutaneous coronary intervention (PCI). Particularly, women have worse health related QoL outcomes, which is consistent with the literature data. Those differences in QoL scores are probably attributed not only to sex peculiarities such as hormonal differences, which have direct impact on heart function [Rumsfeld J., Masoudi F. 2004], but also to other factors (diabetes, smoking, obesity), which are apparent at different level between genders. The obtained data can be considered in evaluation of PCI requirement in males and females.

REFERENCES

- Berger J.S., Sanborn T.A., Sherman W., Brown D.L. Influence of sex on in-hospital outcomes and long-term survival after contemporary percutaneous coronary intervention. *Am. Heart J.* 2006 May; 151(5): 1026-1031.
- Bjorner J.B., Thunedborg K., Kristensen T.S., Modvig J., Bech P. The Danish SF-36 Health Survey: translation and preliminary validity studies. *J. Clin. Epidemiol.* 1998 Nov; 51(11): 991-999.
- Blomkalns A.L., Chen A.Y., Hochman J.S., Peterson E.D., Trynosky K., Diercks D.B. et al. Gender disparities in the diagnosis and treatment of non-ST-segment elevation acute coronary syndromes: large-scale observations from the CRUSADE (Can Rapid Risk Stratification of Unstable Angina Patients Suppress Adverse Outcomes With Early Implementation of the American College of Cardiology/American Heart Association Guidelines) National Quality Improvement Initiative. *J. Am. Coll. Cardiol.* 2005 Mar 15; 45(6): 832-837.
- Dotevall A., Hasdai D., Wallentin L., Battler A., Rosengren A. Diabetes mellitus: clinical presentation and outcome in men and women with acute coronary syndromes. Data from the Euro Heart Survey ACS. *Diabet. Med.* 2005 Nov; 22(11): 1542-1550.
- Duvernoy C.S., Smith D.E., Manohar P., Schaefer A., Kline-Rogers E., Share D. et al. Gender differences in adverse outcomes after contemporary percutaneous coronary intervention: an analysis from the Blue Cross Blue Shield of Michigan Cardiovascular Consortium (BMC2) percutaneous coronary intervention registry. *Am. Heart J.* 2010 Apr; 159(4): 677-683.

6. *Mortensen O.S., Bjorner J.B., Newman B., Oldenburg B., Groenvold M., Madsen J.K. et al.* Gender differences in health-related quality of life following ST-elevation myocardial infarction: women and men do not benefit from primary percutaneous coronary intervention to the same degree. *Eur. J. Cardiovasc. Prev. Rehabil.* 2007 Feb; 14(1): 37-43.
7. *Norris C.M., Spertus J.A., Jensen L., Johnson J., Hegadoren K.M., Ghali W.A.* Sex and gender discrepancies in health-related quality of life outcomes among patients with established coronary artery disease. *Circ. Cardiovasc. Qual. Outcomes.* 2008 Nov; 1(2): 123-130.
8. *Rumsfeld J.S., Masoudi F.A.* Sex differences implications for heart failure care. *Eur. Heart J.* 2004; (25): 101-103.
9. *Schumaker S.A., Schron E.B., Hale C., Kellen J.C., Inkster M., Wimbush F.B., Wiklund I., Morris M.* Gender differences in health related quality of life among postmyocardial infarction patients; brief report, CAST investigators. *Cardiac Arrhythmia Suppression Trials. Women's Health.* 1997; 3: 53-60.
10. *Shu W., Lei W., Peng S.* Recent development of ischaemic heart disease in sex difference. *Postgrad. Med. J.* 2007 Apr; 83(978): 240-243.
11. *Ware J., Kosinski M., Dewey J.* How to Score and Interpret Single-Item Health Status Measures: A Manual for Users of the SF-8 Health Survey. Lincoln, RI. QualityMetric Inc. 2001. 220 p.
12. *Westin L., Carlsson R., Erhardt L., Cantor-Graae E., McNeil T.* Differences in quality of life in men and women with ischemic heart disease. *Scandinavian Cardiovascular Journal.* 1999, 33: 160-165.
13. WHO. Non-Communicable Disease Profile. Estimated proportionate mortality. Available from: <https://apps.who.int/infobase/CountryProfiles.aspx>. Accessed on December 12, 2010.
14. WHO. The top 10 causes of death. World Health Organization. Fact sheet no. 310. Available from: <http://www.who.int/mediacentre/factsheets/fs310/en/index.html>. Accessed on April 15, 2011.