Acute Ischemic Heart Disease

Sex differences in health behavior change after premature acute coronary syndrome

Sylvie S. L. Leung Yinko, RD, MSc, [a,b] Janane Maheswaran, BSc, [c] Roxanne Pelletier, PhD, [b] Simon L. Bacon, PhD, [d,e] Stella S. Daskalopoulou, MD, MSc, PhD, [f] Nadia A. Khan, MD, MSc, [g] Mark J. Eisenberg, MD, MPH, [h] Igor Karp, MD, MPH, PhD, [i] Kim L. Lavoie, PhD, [d,j,k] Hassan Behlouli, PhD, [b] and Louise Pilote, MD, MPH, PhD [b,f,] for the GENESIS-PRAXY investigators [l] *Quebec, British Columbia, and Ontario, Canada*

Background Limited information is available on the health behavior profile of patients with premature acute coronary syndrome (ACS). The purpose of this study is to desribe the health bahvior of young patients with ACS at the baseline and 1 year post-ACS and examine sex differences.

Methods GENESIS-PRAXY is a prospective cohort study of adults (18-55 years old) hospitalized with ACS from 26 centers located in Canada, United States, and Switzerland. Data on diet, physical activity, smoking, alcohol consumption, and recreational drug use were collected through self-administered questionnaires at baseline and 1 year post-ACS.

Results Our analysis included 740 patients with complete data. At baseline, the health behavior profile of young patients with ACS was worse than that of the general population. Men had a lower fruit and vegetable intake, consumed alcohol more, and used recreational drugs more than women. Conversely, fewer men than women were smokers (34% vs 42%). At 1 year post-ACS, the proportion of those consuming ≥5 daily servings of fruits and vegetables increased modestly (+5% vs +1%, for men vs women) but remained lower than the general population. Among women, the prevalence of smoking remained about twice as high as the general population. Recreational drug use also remained higher than in the general population.

Conclusions Despite small improvements at 1 year post-ACS, the health behavior profile of young patients remained worse than that of the general population. Greater efforts to improve health behaviors post-ACS among young patients are needed, and a sex-based approach may be required to ensure successful behavioral changes. (Am Heart J 2015;170:242-248.e3.)

Health behaviors, such as diet, physical activity, smoking, alcohol consumption and recreational drug use are important lifestyle factors that can influence the risk of cardiovascular diseases (CVD).[1] Evidence indicates that adhering to even modest but sustained healthy lifestyle behaviors is associated with reduced cardiovascular morbidity and mortality.[2] Healthy lifestyle behaviors can also be beneficial for secondary prevention, and lifestyle changes are considered critical in improving health after a cardiovascular event.[3] In fact, findings from large-scale observational studies and randomized trials, including the Organization to Assess Strategies in Acute Ischemic Syndromes study, suggest that lifestyle changes after acute coronary syndrome (ACS) may be as important as medication use in the prevention of recurrent events.[1,3,4] A meta-analysis of observational studies found that patients with CVD who stopped smoking had a >30% lower rate of long-term myocardial infarction and mortality.[5] In addition, considerable evidence supports the cardiovascular benefits of healthful changes in dietary and physical activity habits.[6,7]

Sex and age differences with regards to health behaviors have been suggested. For instance, it has been indicated that women are less likely to participate in physical activity than men, whereas a higher proportion of men have a poor diet, smoke, and consume excessive alcohol.[8] Smoking also varies by age, with a higher

prevalence among patients with CVD aged ≤55 years compared with older populations.[9]

Addressing lifestyle changes in young patients with ACS represents an important avenue for decreasing the morbidity and mortality risk associated with ACS as well as for ensuring good quality of life and productivity post-ACS. However, to date, the health behavior profile of young patients with a premature ACS event has not been well characterized. Furthermore, changes in health behaviors post-ACS as well as sex differences remain to be clarified.

In this study, we investigated the health behavior profile of men and women with premature ACS. Specifically, our objectives were to (1) describe and examine sex differences in the health behavior profile of patients with premature ACS at baseline, (2) compare the health behavior profile of patients with premature ACS at baseline and 1 year post-ACS with that of the general population, and (3) determine whether there is a change in health behaviors 1 year post-ACS among young patients and examine sex differences in those changes.

Methods

The GENESIS-PRAXY (GENdEr and Sex determInantS of cardiovascular disease: from bench to beyond-Premature Acute Coronary SYndrome) study is a prospective multicenter cohort study of adults hospitalized with ACS and aged 18 to 55 years. Since 2009, 1,213 patients have been recruited from 24 centers in Canada, 1 in the United States, and 1 in Switzerland. Complete data at baseline and 1 year post-ACS were available for 740 patients. The protocol of GENESIS-PRAXY has previously been described.[10] Acute coronary syndrome included unstable or intermediate coronary syndromes and/or acute myocardial infarction. Eligibility criteria consisted of having symptoms consistent with acute cardiac ischemia within 24 hours of hospital presentation and having either some specific electrocardiographic changes and/or an increase in cardiac enzymes. All participants provided written informed consent. Ethics approval was obtained for all participating centers. The GENESIS-PRAXY study was funded by the Canadian Institutes of Health Research and the Heart and Stroke Foundation.

The reporting of the study was done following the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for observational studies.[11]

Data on health behaviors were obtained through self-administered questionnaires, which were collected at the earliest time possible during hospitalization. The questionnaires contained questions related to dietary habits, physical activity, cigarette smoking, alcohol consumption, and recreational drug use. Data on the general Canadian population statistics were obtained from the 2012 Canadian Community Health Survey (CCHS) and the 2012 Canadian Alcohol and Drug Use Monitoring Survey.[12] We selected the most suitable age category for comparison, as available. For fruit and vegetable intake, physical activity, and smoking, comparisons were performed using the age category of 35 to 44 years, which was the most comparable age group available. For alcohol consumption and recreational drug use, comparisons were carried out with all ages (15+) because more stratified age categories were not available.

We used a validated and well-established food frequency questionnaire (FFQ) to assess the number of servings of fruits and vegetables consumed per day.[13] The consumption of fruits and vegetables is considered to be a reasonable proxy for healthy dietary habits.[14] The FFQ has been adapted from the Behavioral Risk Factor Surveillance System[15] and used in the Rapid Risk Factor Surveillance System[16] and the CCHS. Dietary guidelines recommend the consumption of ≥5 fruits and vegetables per day.[17] In addition, we assessed the frequency of eating at home and at restaurants.

The Godin-Shephard leisure-time physical activity questionnaire was used to assess physical activity.[18] The questionnaire asks about the weekly frequency of engaging in exercise of different intensity, that is, strenuous, moderate, or mild, for >15 minutes during free time during the past year. The questionnaire also assesses the frequency of engaging in regular activity long enough to increase heart rate during the past year. The Godin activity score, used to standardize physical activity according to intensity and frequency, is calculated from the answers. A score of <14 reflects insufficient physical activity, 14 to 23 implies moderate physical activity, and a score ≥24 designates high physical activity (active) with substantial health benefits.

Information on smoking characteristics were collected, such as current smoking, past smoking, average number of cigarettes smoked per day, the age at which patients started smoking, and, for former smokers, the age at which they stopped smoking. The number of pack-years smoked was calculated based on the number of packs smoked per day, multiplied by the average number of years smoked, where a pack was considered to contain an average of 20 cigarettes.[19]

Patients were asked to report details on alcohol consumption habits, including the average number of days per week of alcohol consumption and the average number of drinks per day. Excessive alcohol consumption was defined as >2 drinks per day as per alcohol drinking guidelines.[20,21]

Questions were asked about 3 categories of recreational drugs: cocaine, Viagra, and other recreational or social drugs. At baseline, patients were asked to report whether they had ever used those drugs. At 1 year post-ACS,