Asian Nursing Research 10 (2016) 136–142

Contents lists available at ScienceDirect

Asian Nursing Research

journal homepage: www.asian-nursingresearch.com

Research Article

Differences in Prevalence of Metabolic Syndrome by Breastfeeding Experience of Women in Their 30s and 40s

Hye-Jin Kim, MSN, RN, Hee-Seung Kim, PhD, RN *

College of Nursing, The Catholic University of Korea, Seoul, South Korea

ARTICLE INFO

Article history:
Received 20 January 2016
Received in revised form
28 January 2016
Accepted 2 February 2016

Keywords:
breastfeeding
metabolic syndrome
women

SUMMARY

Purpose: The purpose of this study was to assess the differences in the prevalence of metabolic syndrome in women in their 30s and 40s by breastfeeding experience, using the the fifth Korea National Health and Nutrition Examination Survey (2010) data.

Methods: In this cross-sectional study, a total of 1,053 healthy women in their 30s and 40s, who had given birth was analyzed. To compare women with and without breastfeeding experience, chi-square test and *t* test were used. The relationship between metabolic syndrome and breastfeeding was assessed using logistic regression analysis adjusted demographic and lifestyle covariates.

Results: The breastfeeding experience of women in their 30s was associated with a decreased risk of elevated triglyceride after controlling for income, education, exercise and the last childbirth age [odds ratio (OR) = 0.44, 95% confidence interval (CI) (0.21, 0.95)]. In addition, women who breastfed more children had high odds of metabolic syndrome [OR = 4.03, 95%CI (2.03, 8.00)], and components of metabolic syndrome [abdominal obesity: OR = 2.02, 95%CI (1.17, 3.51), elevated triglyceride: OR = 1.98, 95%CI (1.14, 3.45), elevated blood pressure: OR = 2.65, 95%CI (1.28, 5.49)] than those who never breastfed children.

Conclusions: This study found that postpartum breastfeeding may play a significant role in reducing the risk of metabolic syndrome and also that childbearing is associated with a higher incidence of metabolic syndrome among women in their 30s. For women in their 40s, the risk of metabolic syndrome did not significantly differ depending on the breastfeeding experience. This study indicated that breastfeeding can be a way to reduce metabolic health burdens in women in their 30s.

Introduction

Metabolic syndrome is a complex condition with metabolic abnormalities characterized by abdominal obesity, hypertriglyceridemia, low high density lipoprotein (HDL) cholesterolemia, hyperglycemia, and hypertension due to insulin resistance [1]. It is associated with the risk of cardiovascular disease or diabetes [1].

The prevalence of metabolic syndrome in South Korea, using data from the fifth Korea National Health and Nutrition Examination Survey (KNHANES V-1) in 2010, was 16.8% in males and 20.7% in females based on the standard suggested by the International Diabetes Federation [2]. The results of the survey also showed a higher incidence of metabolic syndrome with age: 10.6% in people in their 30s, 14.9% in those in their 40s, 27.5% in those in their 50s, and 35.4% in those in their 60s [2].

Moreover, the number of deaths from cardiovascular diseases has significantly increased among females, from 32.2 people per 100,000 population in 2001 to 51.3 people per 100,000 population in 2011 [3]. This increased mortality is related to the increased prevalence of metabolic syndrome [4], because metabolic syndrome is a major risk factor for development of cardiovascular disease [5]. Cardiovascular diseases are caused by the multiple risk factors such as abdominal obesity, hypertriglyceridemia, low HDL cholesterolemia, hyperglycemia, and hypertension related to metabolism in 20.0% of males and 48.0% of females [6]. Having more than three of these risk factors is related to increased cardiovascular disease prevalence and mortality [6]. Thus, there is a clear need for preventive intervention for metabolic syndrome.

The Framingham Risk Score (FRS) is another method of predicting cardiovascular diseases. Higher FRS indicates heavier weights [7] and more determinant factors of metabolic syndrome

* Correspondence to: Hee-Seung Kim, RN, PhD, College of Nursing, The Catholic University of Korea, 222 Banpo-Daero, Seocho-Gu, Seoul 06591, South Korea.
E-mail address: hees@catholic.ac.kr

http://dx.doi.org/10.1016/j.anr.2015.02.002

[8]. Therefore, identifying FRS and intervention for metabolic syndrome is important for prevention of cardiovascular disease. Metabolic syndrome is caused by various genetic, lifestyle, environmental, socioeconomic, and psychological factors [9]. Among the lifestyle factors, breastfeeding helps shed weight through consumption of much energy due to changes in fat metabolism and the discharge of breast milk [10]. It also improves the metabolism of glucose in the blood, which positively affects females with gestational diabetes and promotes homeostasis of mothers' glucose levels [11] eventually decreasing the incidence of metabolic syndrome, hypertension, and cardiac infarction [12–16].

Studies on breastfeeding showed that breastfeeding is associated with decreased prevalence of metabolic syndrome [11,17] and cardiovascular disease [18]. However, these studies were conducted locally only on middle-aged menopausal females or those in their 40s–60s. Moreover, few hospitals participated in them, which made it difficult to generalize the results to all hospitals. Those studies did not include information on the risks of cardiovascular diseases and breastfeeding. As such, few studies have investigated the relationship between breastfeeding and the risk of cardiovascular diseases in Korean women with childbearing potential.

Therefore, the purpose of this study was to analyze the differences in the risk of cardiovascular diseases and the prevalence of metabolic syndrome based on the breastfeeding experience of women in their 30s–40s, using the data from the KNHANES V-1(2010).

Methods

Study design

This study used raw data from the KNHANES V-1 (2010), which is a cross-sectional and nationally representative survey. KNHANES is part of a series of health-related programs sponsored by the Korean Centers for Disease Control and Prevention. It has been used since 1998 to assess the health and nutritional status of Koreans [19]. The investigators of this study used part of health survey and examination survey results of raw data after we obtained an approval from the Korean Centers for Disease Control and Prevention.

Setting and sample

The population size for the raw data from the KNHANES V-1 (2010) was 8,473 (3,850 men and 4,623 women). The subjects of this study are females with childbearing potential in local communities, who completed the Health Condition Survey and a health check-up, were between 30 and 50 years old, had given birth before, and had not had a stroke, myocardial infarction, angina pectoris, renal failure, or cancer. The results of the analysis showed that the mean age at the last childbirth was 30.3 years old, and the mean menopausal age was 48.6 years. Considering the analysis results, the age range of the subjects was limited to 30–49 years. A total of 1,053 participants (542 in their 30s and 511 in their 40s) who met the criteria were selected as the final subjects of this study.

Ethical consideration

The KNHANES V-1 (2010), participants signed an informed consent form. The raw data were published excluding the part that can identify individual subjects, based on the Privacy Protection Act. Since our study used data from those surveys, ethical approval was not required (MC13EASE0054).

Measurements

Demographic and lifestyle factors

The demographic factors of the participants included their age, household income level, education level, employment, and spouse. Their household income levels were classified into high, medium, and low. Their education levels were classified into high (completed high school, and completed university) and low (completed or dropped out of primary school, completed middle school). Their employment status was indicated with either a “yes” or a “no” (for employed or unemployed, respectively), as was whether or not they were living together with their spouse.

Regular exercise, and drinking and smoking habits were included in the lifestyle factors. To simplify data interpretation, regular exercise was defined as 3 days or more a week of vigorous physical exercise for 20 minutes or more, 5 days or more a week of moderate physical exercise for 30 minutes or more, or 5 days or more a week of walking for 30 minutes or more. We considered that no exercise was performed when the participants did not perform any of aforementioned exercises based on the study of Oh et al [20]. As for drinking, those who drank hard liquor more than once a month in the last year were considered drinkers. With regard to smoking, three categories were used based on the raw data: smoker, past smoker, and nonsmoker.

Gravidity and childbirth history

For the characteristic of the participants' childbirth experience, the age at the first childbirth, the age at the last childbirth, the number of pregnancies, the number of natural births, the number of women who delivered their babies via Cesarean section, and the number of miscarriages were used as continuous variables. The breastfeeding experience, number of children breastfed, and duration of breastfeeding (in months) were also included in the continuous variables. The breastfeeding experience was indicated with either a “yes” or a “no”.

Metabolic syndrome

The participants were deemed to have had metabolic syndrome when they fell under three or more of the five categories based on those of the International Diabetes Federation and the American Heart Association/National Heart, Lung, and Blood Institute (AHA/NHLBI) in 2009 [21]. For the weight measurement, the definition of abdominal obesity published by the Korean Society for the Study of Obesity in 2006 was used [22]. The five criteria are as follows: (a) waist measurement $\geq$ 85 cm; (b) triglycerides $\geq$ 150 mg/dL or use of medication for elevated triglycerides; (c) HDL cholesterol $<$ 50 mg/dL or medication for reduced HDL cholesterol; (d) blood pressure (BP): systolic BP $\geq$ 130mmHg and/or diastolic BP $\geq$ 85mmHg or use of medication for hypertension; (e) fasting glucose $\geq$ 100mg/dL or use of medication for hyperglycemia. Each criterion gives 1 point, so the metabolic syndrome score range is 0–5 points.

The physical examinations were conducted by a team of experts in mobile physical examination vehicles. The participants were asked to fast for 12 hours before the examination. Waist circumference was measured using the Seca 200 ruler (Hamburg, Germany) between the lowest rib and iliac crest [23]. For the BP, the results were corrected based on the mean height of the arms near the heart (for females: 81 cm). Blood samples were collected using vein puncture and sent to Seegene Medical Foundation for analysis. The triglycerides, HDL cholesterol, and fasting blood sugar were analyzed using a Hitachi Automatic Analyzer 7600 (Hitachi, Japan), based on the enzyme method [19].