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The Effect of Quality of Life on Cardiometabolic Risk Factors in Postmenopausal Women

Chavela Riotutar (Humboldt State University)

Introduction

A major health hazard is growing in our modern world that is not a communicable disease, rather a consequence of the Western lifestyle's influence. Metabolic syndrome (MetS) has become a global epidemic, resulting from increased consumption of high calorie, low fiber, processed and ultra-processed foods, compounded by a decrease in physical activity and more sedentary leisure time activities. The cluster of risk factors known as MetS is characterized by the co-occurrence of at least three of the five following criteria: waistline circumference of more than 35 inches; systolic blood pressure above 120 mmHg or diastolic blood pressure above 80 mmHg; triglyceride level above 150 mg/dL; fasting blood glucose level above 100 mg/dL; and HDL-C level below 50 mg/dL. The combination of these conditions substantially increases the risk for development of Type 2 diabetes and cardiovascular disease (CVD) (Saklayen, 2018).

Chronological aging is an additional factor as the risk for stroke doubles with every decade after the age of 55 (CDC, 2017). In 2017, 12.2% of adults in the United States had Type 2 diabetes and 34% had MetS (Saklayen, 2018). The economic impact of MetS is evidenced by the high usage of medical care associated with the individual components of MetS, i.e., a 40% increase in medical care costs after the incidence of diabetes, amounting to trillions worldwide (Nichols & Moler, 2011). In a longitudinal, 9-year study by Janssen et al. (2010), menopause-related testosterone levels were implicated as a hormonal change associated with three of the five components of MetS due to the accumulation of intraabdominal fat that contains more androgen recep-

tors. The research suggests that a decrease in estrogen levels, which promote gluteo-femoral fat accumulation, leads to the androgen-dominated hormonal milieu that increases a woman's risk for MetS. Before the age of 45, CVD is rare among women but after the age of 65, cardiometabolic risk factors accelerate until they surpass those in men, demonstrating that menopause increases the risk of CVD independent of normal aging (Ebtekar et al, 2018). The emergence of MetS indicators during menopausal transition coincides with the decline in estrogen production and may explain the higher rate of CVD in postmenopausal women (Carr, 2003). Due to the hormonal changes of menopause, CVD is the primary cause of mortality for women in the United States, responsible for about 1 in every 5 deaths in 2017 (CDC, 2020).

The gradual process leading to menopause begins around age 45 when fertility declines as the ovaries get smaller and produce less of the hormones (estrogen and progesterone) that control the menstrual cycle (Pinkerton & Stovall, 2010). Perimenopause begins about three to five years before menopause and is characterized by irregular menstrual cycles, vasomotor symptoms, and psychological reactions (Larroy et al., 2020). Menopause is reached when a woman has no menstrual cycle for twelve months without any other cause, (e.g., illness, medication), and post menopause is the final stage, one year since the last menstrual cycle until end of life. The direct effect of estrogen deficiency on body fat distribution (central obesity), insulin action, and stiffening of the arterial wall increase the chance for a menopausal woman to develop MetS by 60% (Carr, 2003). Identification and treatment of these indicators for MetS at

an early stage provides the opportunity to prevent or postpone diabetes and CVD by making changes to daily lifestyle. Modifications to physical activity and diet may reduce future health care needs and improve overall well-being and quality of life (QOL) during menopause.

The significance of QOL as a public health concern was established by the World Health Organization (WHO) in 1949; health is not just an absence of disease, it is a state of complete physical, mental, and social well-being determined by: personal habits, social engagement, education/income, and living environment, (WHO, 2019). A healthy living environment is associated with a lower incidence of diabetes and hypertension while adverse living conditions increase the production of cortisol and the risk for CVD, (Diez Roux et al., 2016). Transitioning into menopause has been found to have a consistently negative impact on QOL, health outcomes, and increased health risks. However, research surrounding this topic fails to address several important variables associated with a woman's physiological aging process such as changes in sexual activity, alterations in sleep patterns, increased caregiving responsibilities, and severity of chronic medical conditions that occur during menopause (Hess et al., 2012). The current life expectancy of women in the United States is 81.1 years (CDC, 2020). Accordingly, it can be said that women who live 81 years spend a significant part of their life in post-menopausal status.

Menopause and MetS are both associated with an unsatisfactory QOL in several studies linking social factors to health. By considering all domains that impact postmenopausal health, we can better understand how to assist this population to enhance QOL and improve health outcomes.

Research demonstrates a correlation between low QOL scores and increased risk for cardiometabolic diseases. Additionally, menopause has been correlated with lower QOL scores as well as increased risk for cardiometabolic diseases. The direct connection between these three conditions has yet to be examined. Therefore, the purpose of this study is to investigate the relationship between QOL and cardiometabolic risk indicators in postmenopausal women. The objective of this study is to assess the impact of menopause on QOL and the associated risk factors of cardiometabolic disease, specifically metabolic syndrome in postmenopausal women. Hypothesis: Postmenopausal women that express a greater burden in life (stress, financial struggle, social isolation, etc.) will show greater signs of negative cardiometabolic health outcomes. Approval for this re-

search was granted by the Institutional Review Board (IRB registration #20-061) at Humboldt State University (HSU) in December 2020.

Method

The inclusion requirements for this study are women, female since birth, (age > 45 years) with more than twelve months since the date of last menstruation (postmenopausal). Participants must have internet access, and the ability to read and respond to the confidential online survey in English. Eighty participants will be recruited through emails to selected women's groups with instructions and a link to the survey powered by Qualtrics.com through Humboldt State University. Additionally, the researcher will create new social media pages on Facebook and Instagram that are specific to this study, then post the flyer with instructions and a link to the survey on Qualtrics.com. The QOL score is measured with 20 questions that assess the socioeconomic factors identified as determinants of health: personal habits, social engagement, education/income and living environment. The survey uses an 11-point response scale ranging from extremely dissatisfied (0) to extremely satisfied (10), resulting in a total score of 20 to 220 achieved by the sum of the responses. Additional data collection includes demographics, physical characteristics, physical activity level, sexual health, current health conditions, and medical history. Given the timing of the survey, we have included questions about changes due to the impact of sheltering in place and social distancing measures instituted in March 2020. A multiple linear regression model will be used to analyze the relationship between QOL scores, current health conditions, and sociodemographic data. The survey will be administered by the participant in their own environment without a time constraint, and responses will be recorded on the Qualtrics.com secure website. Sampling will be performed between December 2020 and March 2021. There are 35 current participants. The health history data and completed consent forms will be stored in a secure folder in the Humboldt State University Qualtrics software program for the remainder of the study and a minimum of 3 years after completion.

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