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Original Article

The prevalence of metabolic syndrome in postmenopausal women: A systematic review and meta-analysis in Iran

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ABSTRACT

Metabolic syndrome is a set of cardiovascular risk factors that increase the risk of cardiovascular disease, diabetes and mortality. Women are at risk of developing metabolic syndrome as they enter the postmenopausal period. The present systematic review and meta-analysis was conducted to estimate the prevalence of metabolic syndrome in Iranian postmenopausal women. In this systematic review and meta-analysis, 16 national articles published in Persian and English were gathered without time limit. National databases such as SIDs, IranMedex and MagIran, and international databases such as Web of Science, Google Scholar, PubMed and Scopus were used to search the relevant studies. We searched for articles using the keywords “menopause”, “postmenopausal”, “metabolic syndrome”, “MetSyn”, and their combinations. Data were analyzed using the meta-analysis method and the random effects model. Analysis of 16 selected articles with a sample size of 5893 people showed that the prevalence of metabolic syndrome in Iranian postmenopausal women was 51.6% (95% CI: 43–60). The prevalence of metabolic syndrome based on ATP III and IDF criteria was 54% (95% CI: 59–63) and 50% (95% CI: 45–56), respectively. Based on the results of univariate meta-regression analysis, the increase in the mean age of postmenopausal women ($p = 0.001$) and sample size ($p = 0.029$), the prevalence of metabolic syndrome increased significantly. More than half of postmenopausal women in Iran suffer from metabolic syndrome. Providing training programs for postmenopausal women to prevent and control cardiovascular disease and its complications seems to be necessary.

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1. Introduction

Menopause is a natural biological process that occurs in every woman's life [1]. In this period, women are exposed to many chronic diseases that affect their quality and quantity of life. Depletion of sex steroid hormones due to aging and gonadal failure may potentially increase the vulnerability to disease in hormone-responsive tissues, such as the brain, bone and the cardiovascular system [2]. This age range is associated with endocrine changes, such as hypoestrogenism due to decrease in ovarian activity, biological changes due to infertility, and clinical changes due to changes in menstrual cycle [3]. The end of menstrual activity along with estrogen deficiency and weight gain are risk factors for the health of postmenopausal women, which may lead to hyperlipidemia and increased blood sugar [4]. Undesirable changes occur in

the lipid profile in this period, and cardiovascular disease is either caused or exacerbated [5]. Cardiovascular disease is the leading cause of mortality among women and, according to the American Heart Association, one in every three adult women experiences some degree of cardiovascular disease [6]. The mortality rate of cardiovascular and cerebrovascular disease in postmenopausal women is higher than that of breast cancer [7]. Considering that cardiovascular disease is rare among women under 45 years of age, but its prevalence in women older than 55 years of age is higher than men, it is believed that menopausal transition increases the risk of cardiovascular disease independent of normal aging [8].

Metabolic syndrome (MetS) refers to a set of cardiovascular risk factors such as hypertension, hyperlipidemia, high blood sugar, and abdominal obesity, which increases the risk of developing cardiovascular disease and diabetes [9]. Nearly one-third of the Iranian population and 20% of the adult population in the world suffer from metabolic syndrome [10,11]. The risk of myocardial infarction, stroke, and cardiac mortality in people with metabolic syndrome is twice as high as those without metabolic syndrome [12]. Metabolic syndrome and its components, such as

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hypertension, are more common in older women compared to men, which can be due to menopausal transition, ovarian senescence, hormonal changes, and increased body mass index [13].

Various studies have been conducted to evaluate the prevalence of metabolic syndrome in postmenopausal women in Iran, and they reported varied results. Studies have shown that the prevalence of metabolic syndrome in postmenopausal women varies from 28% to 88% [14,15]. Metabolic syndrome is very important because it increases the chances of developing cardiovascular disease, diabetes and mortality. Considering that any plan, prevention and control of metabolic syndrome in postmenopausal women requires accurate statistics of the community, the researchers decided to conduct a study to estimate the prevalence of metabolic syndrome in Iranian postmenopausal women.

2. Methodology

2.1. Search strategy

In this study, the prevalence of metabolic syndrome in postmenopausal period was examined based on articles published in national and international journals without time limit. National databases such as Scientific Information Database (SID), IranMedex and MagIran, and international databases such as Web of Science, Google Scholar, PubMed and Scopus were used to search the relevant studies. We searched for articles using the keywords “menopause”, “postmenopausal”, “metabolic syndrome”, “Met-Syn”, “X syndrome” and their combinations, and the Persian equivalents were used in national databases. The references of the collected articles were also reviewed to access further articles.

2.2. Study selection and data extraction

The inclusion criteria were: Observational studies that reported the frequency or prevalence of metabolic syndrome, studies conducted in Iran, studies published in Persian or English. Duplicate studies and lack of access to the full text of the articles were the exclusion criteria. In some studies, the samples were divided into three groups: premenopausal, menopausal (irregular menstrual periods) and postmenopausal (without menstrual periods), and the prevalence of metabolic syndrome was reported for each group separately. The prevalence of metabolic syndrome reported in postmenopausal women was analyzed in these articles.

Considering the inclusion and exclusion criteria, the titles and abstracts of articles were studied by two researchers independently and the relevant items were separated and the full text was extracted. In case of disagreement between the two researchers, the article was judged by the corresponding author, who was a meta-analysis expert. A form was used to record the data from the selected articles, which included the variables of first author of the article, the year of publication of the article, the location of the study, the total sample size, the number of postmenopausal women with metabolic syndrome, the mean values of the components of the metabolic syndrome and the methodological quality score of the articles. The methodological quality of articles was examined based on a tool used in national and international studies [16,17]. In this tool, the type of study, the compared groups, the characteristics of the samples, the questionnaire and the sample size are evaluated, and each of these items is given a score of 0 to 3, according to which the articles are divided into three categories: low quality (score 0 to 5), moderate (score 6 to 10) and strong (score over 10). Finally, 16 related articles were selected based on the inclusion and exclusion criteria.

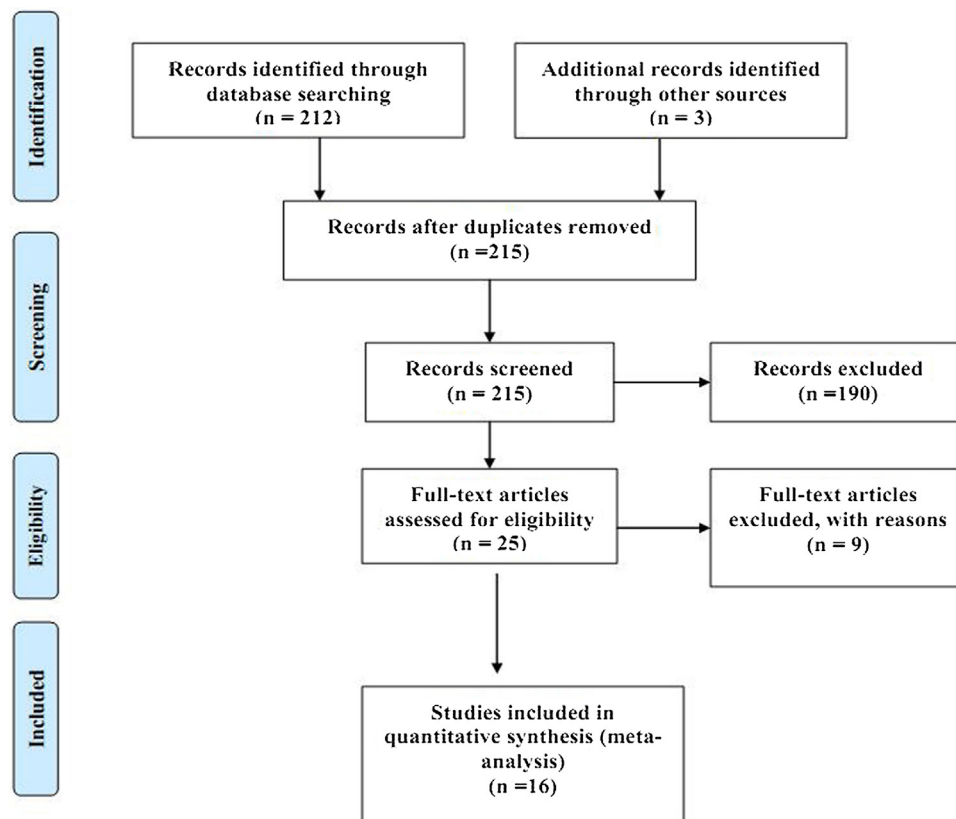


Fig. 1. Screening flowchart and selection of qualified articles according to PRISMA guidelines.

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