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Prevention of coronary heart disease and osteoporosis in women aged 45 to 49 years: a challenging role for general practitioners

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ABSTRACT

Objective: Part of the risks for coronary heart disease (CHD) and osteoporosis in women are established by their lifestyle in the premenopausal period. Therefore, we assessed the risk of women aged 45 to 49 years for CHD and osteoporosis and its relation with socioeconomic status (SES) and access to general practitioners (GPs) to provide clues for prevention.

Methods: The health interview data used for this study originated from the second Dutch National Survey of General Practice, a study with a response rate of 64.5%. We studied SES, risk factors for CHD and osteoporosis, and access to GPs in women aged 45 to 49 years.

Results: The data of 571 women aged 45 to 49 years were included. A total of 39% had an increased risk for developing CHD in the next 10 years, and 3% had a high risk. A total of 22% had an increased risk for osteoporosis. We found a significant relation between SES and unhealthy lifestyle. An unhealthy lifestyle led to an increased or high risk for CHD, and a high osteoporosis risk. We did not find a significant relation between SES and GP consultation frequency.

Conclusions: Special attention is required for women with the lowest SES because they have an unhealthier lifestyle than do women with middle or the highest SES. The group of women at higher risk for CHD and osteoporosis consulted their GP with the same frequency as did women at lower risk. The Dutch GP seems to be in an ideal position to play a role in the prevention of CHD and osteoporosis in premenopausal women because access to GPs is not influenced by SES.

The risks for coronary heart disease (CHD) and osteoporosis in premenopausal women are underestimated because of the perception that women are protected against ischemic heart disease and osteoporosis by their hormonal status. However, part of the risks for CHD and osteoporosis in postmenopausal women is established by their lifestyle in the premenopausal period.¹⁻³ Most women do not perceive that heart disease is a substantial health concern and are not well informed about their risk.⁴ Knowledge about and awareness and perception of susceptibility to osteoporosis are limited and even more limited in women with low

educational attainment.⁵⁻⁷ For instance, perimenopausal women smokers are more aware of their increased risk for developing lung cancer than their increased risk for developing heart disease or osteoporosis.⁸ Misconception of actual risks influences attentiveness to risk reduction or disease prevention messages and, consequently, knowledge and behavior. Even though CHD is still portrayed as a typical men's disease, it is the leading cause of death among women.⁹ The incidence of myocardial infarction and angina pectoris increases with age in both sexes.

With advancing age, the incidence of events in women approaches the incidence seen in men.¹⁰ Apart from a genetic predisposition, an unhealthy lifestyle contributes to increasing the risk for CHD.¹¹ In the Minnesota Heart Study, Luepker et al¹² found that CHD and its risk are more frequent among those of lower socioeconomic status (SES). Education is significantly and inversely related to blood pressure, smoking, and body mass index (BMI) for both men and women. Once confronted with CHD, SES influences the referral pattern: women with low SES were referred to cardiologists significantly less than men were.⁹ Osteoporosis is largely preventable by optimizing peak bone mass in younger years, maintaining bone mass in adult years, and minimizing bone loss in later years.¹³ Weight-bearing physical activity and adequate intakes of calcium are effective throughout life.¹⁴ Unhealthy behavior such as cigarette smoking and excessive alcohol intake induces bone loss.¹⁵⁻¹⁸ Epidemiological research shows that postmenopausal women have the highest incidence of osteoporosis.^{13,14} In the National Health and Nutrition Examination Survey (NHANES) III study, Wang and Dixon¹⁹ highlight important socioeconomic differences in bone mineral density.

Healthcare providers like general practitioners (GPs) are important target professionals for lifestyle-related diseaseprevention messages and strategies focused on women. Most women feel comfortable talking to their GP about preventive health options.⁴ Management of lifestyle and risk factors depends partly on adequate access to health care. The Dutch GP has a central position in health care as gatekeeper.

When we get more insight into the health behavior of women aged 45 to 49 years and their use of GP service, we can find a way to motivate them to adjust their lifestyle.

Besides, we must find out how GPs can play a role in the prevention of CHD and osteoporosis in women, especially in the light of increasing health problems in their near future.

Therefore, we need to know the frequency of GP consultation among these women. We formulated the following questions: what is the risk for two main lifestyle-related problems, CHD and osteoporosis, in women aged 45 to 49 years? What is the relation between these lifestyle-related problems and SES? And what is the use of GP care among these women? We selected this age group because these women are predominantly premenopausal. This means that prevention can take place before the actual disease reveals itself. Moreover, in this premenopausal period, we expected less interference from climacteric symptoms.

METHODS

Health interview data for this study originated from the second Dutch National Survey of General Practice (DNSGP-2).²⁰ The DNSGP-2 was carried out with the aim of providing actual information for researchers and policy makers about the role of general practice in the Dutch healthcare system.

Data were collected between April 2000 and January 2002.

The study was carried out in 104 general practices in the Netherlands, comprising 195 GPs (in total, 164.75 GP fulltime equivalents). For the Health Interview Survey, an all-age random sample of 19,685 participants (approximately 5% of the patients listed in the participating practices) was drawn.

The distribution of age, sex, and place of residence of the 12,699 (64.5%) respondents was comparable with that of the sampled population.²⁰ Interviewers were trained for the computer-assisted personal interview. The duration of the interview was, on average, 90 minutes, and it took place at the respondent's home. The interview included mostly validated instruments to establish sociodemographic status, health status, healthcare utilization, and their determinants. The interviews were carried out over 1 year, with a random fourth part per successive quarter of the year, to avoid seasonal patterns.

From the 12,699 respondents, 571 were women between 45 and 49 years old. From the interviews, the following data were used for this study.

Risk factors

Smoking: a distinction was made between current smokers and current nonsmokers. Smokers were asked at what age they started smoking.

Alcohol abuse: alcohol abuse is defined as two or more positive items on the CAGE test (range, 0-4).^{21,22}

Physical activity: physical activity was assessed by using the Short Questionnaire to Assess Health-Enhancing Physical Activity. The reliability and validity of this questionnaire have been established before.²³ Distinction was made between insufficient physical activity (G5 d/wk, a minimum of 30 min of moderate activity) and sufficient physical activity. For reasons of efficiency, the Short Questionnaire to Assess Health-Enhancing Physical Activity was applied only in a random 50% of the respondents (235 women).

BMI: BMI was based on self-reported height and weight: underweight is defined as having a BMI less than 18.5 kg/m²; overweight as BMI equaling or exceeding 25 kg/m²; and obesity as BMI exceeding 30 kg/m².

Insufficient calcium intake: insufficient calcium intake was determined by self-reported no consumption of milk and yogurt at all and less than one slice of cheese per day. For reasons of efficiency, the dietary questionnaire was applied only in a random 50% of the respondents (278 women).

Unhealthy lifestyle: this includes smoking, alcohol abuse, insufficient physical activity, insufficient calcium intake, or being overweight.

Risk for CHD: to predict the risk for CHD, we used the Framingham Risk Prediction Score.²⁴ This algorithm provides an estimation of the total CHD risk (risk of developing one of the following: angina pectoris, myocardial infarction, or death from coronary disease) in the course of 10 years and originally includes age, cholesterol, blood pressure, diabetes mellitus, and smoking.

We included age, the presence of hypertension (derived from the electronic medical record of the respondents), smoking, and diabetes mellitus (derived from the electronic medical record of the respondents). This score is applicable only in persons without known heart disease, so we excluded the women with known CHDs.

This information was derived from the electronic medical record of the respondents. We adjusted the score because of the absence of data on cholesterol levels in our study. Three categories were defined based on the adjusted Framingham risk scores and reference values: low (for women aged 45-49 y, a 3% risk for CHD in the next 10 years is deemed low risk),²⁴ intermediate (between the low risk and average risk of 93% and e5%, respectively), and high (above the average risk of 95%).

[TABLE 1]

Osteoporosis risk: an increased osteoporosis risk was defined by insufficient physical activity or insufficient calcium intake.

Use of GP service: we measured the consultation frequency of the GP and the number of prescriptions by the GP.

These data were derived from the electronic medical record of the respondents issued in 1 year.

Socioeconomic status

For SES, we used the highest accomplished educational level as proxy measure, divided into three groups: lowest (none or primary education), middle (lower secondary professional education), and highest (higher professional education and university) educational level.²⁵

Analyses

Statistical analysis was performed with SPSS statistical software for Windows. Descriptive statistics (percentages) were calculated to describe the study population. W² analysis was performed to test the influence of SES on unhealthy lifestyle and on the risk for osteoporosis and CHD, as well as the relation between SES and use of GP service.

RESULTS

The data of 571 women aged 45 to 49 years were included.

The respondents were equally divided among these 5 years of age. Table 1 gives the characteristics of the women in the study.

Risk factors for CHD and osteoporosis

More than one third (37%) of the women smoked; 95% of them were younger than 20 years when they started smoking.

More than 1 (11%) in 10 women reported alcohol abuse.

Also, one (21%) in five women reported insufficient physical exercise; 40% were overweight (BMI 925 kg/m^2 ; Table 2) and 11% were obese (BMI 930 kg/m^2). A total of 11% reported hypertension and 2% reported diabetes.

The prevalence of an intermediate risk (between 3% and 5%) for CHD in the next 10 years was 39%. Of the respondents, 22% did not have sufficient physical exercise or sufficient calcium intake. This group had an increased risk for osteoporosis (Fig. 1).

[TABLE 2] [FIGURE 1]

SES and risks

SES and risk factors for an unhealthy lifestyle were interrelated ($P = 0.016$). In 40% of the women with the highest SES, we found no risk factor.

SES and the risk for CHD were interrelated: the lower the SES, the higher the risk for CHD ($P = 0.04$). SES and the risk for osteoporosis were interrelated as well. A high osteoporosis risk was associated with low SES ($P = 0.04$; Figs. 2 and 3).

Use of GP care and access to the GP

We did not find a significant association between SES and GP consultation frequency. To determine the use of GP service, we found that the prescription rate of women with low SES was higher compared with that of women with middle or higher SES ($P = 0.05$). More than 80% of the women reported at least one visit to her GP in the year before the interview.

[FIGURE 2] [FIGURE 3]

DISCUSSION

Summary of main findings

Our findings demonstrate the high prevalence of unhealthy lifestyle among a population of middle-aged, predominantly premenopausal Dutch women. Many had an unhealthy lifestyle and had an increased risk for CHD and osteoporosis. In the presence of a low educational level, this risk behavior increased, increasing the risk for CHD and osteoporosis. We found that SES and an increased risk for CHD were interrelated.

These results are in line with conclusions drawn from the Minnesota Heart Survey and the NHANES III study in the United States,^{12,26} although the age groups were much more extended than ours, 25 to 74 and 25 to 64 years, respectively.

The higher risk for CHD can indeed result into a higher morbidity and mortality of CHD,^{9,27} and this higher risk may reveal itself a few years later in the case of the group of women we studied. In the NHANES III study, socioeconomic differences were found in bone health among ethnic groups of postmenopausal women, associated with calcium intake, physical activity, and smoking.¹⁹ The women we studied were younger than the postmenopausal women from the NHANES III study but show the same risk factors associated with low SES leading to a higher risk for osteoporosis.

More than 80% of the women reported at least one visit to her GP in the year before the interview. To three of four women, medication was prescribed. We might therefore assume that this group is in the sight of their physician. We found a higher prescription rate in women with low SES. We concluded that the GP use and access to the GP of women with low SES are adequate.

Strengths and limitations of the study

The strength of this study is that we focused on a group of women with good access to GP service, providing us with many data on their health and health behavior. By using a nationwide representative survey (the DNSGP-2), we reached a high response.

Limitations of this study include the definition of an increased osteoporosis risk. There is much evidence that smoking, and even alcohol abuse, increases the risk for osteoporotic fractures. We defined the risk only by physical activity and calcium intake because we could not find a validated count method or algorithm for reproducing the osteoporosis risk.¹⁵⁻¹⁸ We acknowledge the fact that there are many different ways to determine osteoporosis risk. Nevertheless, in our definition, our study revealed a significant relation between SES and an increased risk for osteoporosis.

In other studies, an inverse relationship of osteoporosis and fractures with level of education and lower income was concluded as well^{19,28-30}; therefore, we assumed that by taking insufficient physical exercise and a low calcium intake into account, we identified the women with a higher risk for osteoporosis in our study. It is the challenge of future research to develop a tool for GPs to determine the osteoporosis risk.

Missing data on cholesterol levels were the reason that we were obligated to adjust the Framingham risk score to predict the risk for CHD. This could lead to an underestimation of the risk for CHD. Another limitation is the small group of women with the lowest educational level, who comprised only 10% of the total.

The Framingham risk score seems to underestimate the risk for women with a low and intermediate score. D'Amore and Mora³¹ found that it is important to be aware of the limitations of global estimates of risk such as the Framingham risk score, particularly when asymptomatic women are evaluated. Additional means of assessing risk are useful tools to improve the accuracy of risk assessment, especially in women who are deemed at intermediate risk. A substantial majority of US women (approximately 80%-90%) are deemed at low risk when the Framingham risk scores are applied.

This is in contrast to the high lifetime risk for cardiovascular disease, which affects one in two women after the age of 40 years.^{31,32} Among women classified as low risk by the Framingham risk estimation, a third had significant subclinical atherosclerosis.³³ We assume that in reality, the numbers of women at intermediate risk are higher than the numbers we found.

Lastly, we made use of some data that were self-reported, like smoking habits, alcohol abuse, and physical exercise.

This could lead to an underestimation of the risk behavior.

Implications for clinical practice and future research

We found several areas where middle-aged women could benefit from physician counselling on health behavior.

Women consulted their physicians on a regular basis, including women with a lower SES. GPs can use consultations for preventive activities such as referral to a nurse practitioner, a dietician, or programs to motivate physical exercise, like subsidized sporting programs for people with a low income for which GPs can write a prescription for participation and financial compensation. They can also inventory risk behavior in (new) patients and discuss this behavior in the light of their future risk. Special attention is required for women with the lowest SES, because their unhealthier lifestyle is leading to a higher risk for CHD and osteoporosis, and screening activities in private practices for the Bworried well[do not reach these high-risk groups of women of low SES. Interventions by their GP are needed to improve their health. Even though the reason for the women's visit is probably most of the time not their lifestyle and health behavior, GPs should be more alert regarding the health risks they are running because it is the GP who reaches these high-risk groups, and with relatively minor effort, preventive actions can take place in the GP practice. Future research must focus on preventive efforts, like the implementation of nurse practitioners in GP practices and (subsidized) motivational programs to stimulate and enhance physical activity. Dutch GPs seem to be in an ideal position because access to GPs is not influenced by SES.

CONCLUSIONS

In this study, we found a relation between low SES and a substantially increased risk for CHD and osteoporosis in women aged 45 to 49 years. We found that this group of Dutch women of low SES with a higher risk for CHD and osteoporosis consulted their GP in the same frequency as did women with a lower

risk for these diseases. The Dutch GP should therefore be a key player in the prevention of CHD and osteoporosis related to an unhealthy lifestyle in premenopausal women.

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TABLE 1

TABLE 1. Characteristics of the population of women aged 45 to 49 years (n = 571)

Characteristic	%
Age	
45 y	21
46 y	20
47 y	21
48 y	18
49 y	21
Socioeconomic status	
Lowest educational level	10
Middle educational level	66
Highest educational level	24
Use of general practitioner service	
At least one visit in the year before the interview	83
Medication prescribed	78

TABLE 2

TABLE 2. Unhealthy lifestyle

	% of Women (n = 571)
Smoking	37
Alcohol abuse	11
Insufficient physical activity	21 ^a
Overweight (body mass index >25 kg/m ²)	40
Insufficient calcium intake	0.3 ^b

^an = 235.

^bn = 287.

FIGURE 1

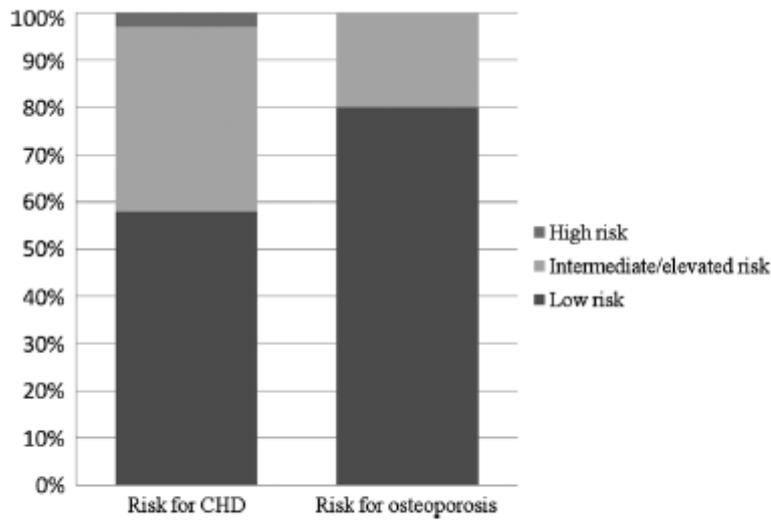


FIG. 1. Risk for CHD (n = 571) and osteoporosis. CHD, coronary heart disease.

FIGURE 2

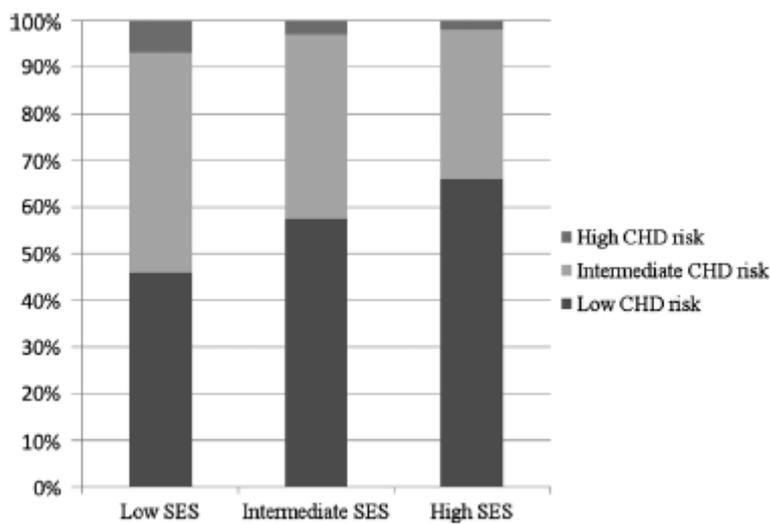


FIG. 2. Relation between SES and risk for CHD (n = 563; $\chi^2 P = 0.04$). SES, socioeconomic status; CHD, coronary heart disease.

FIGURE 3

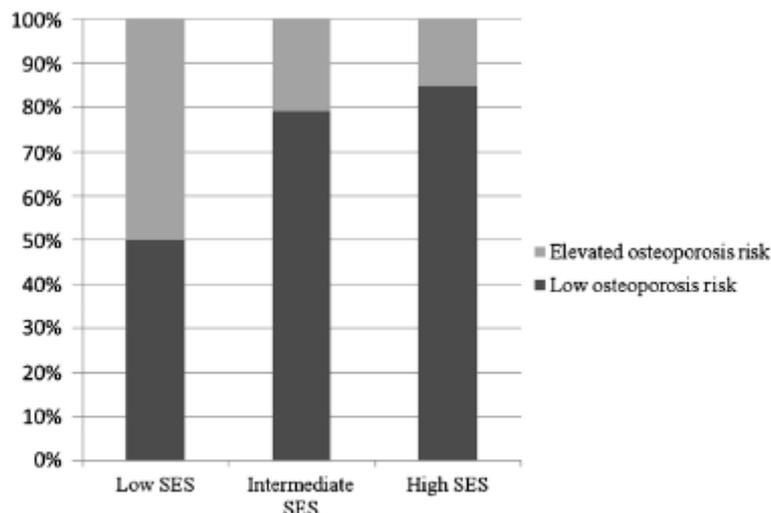


FIG. 3. Relation between SES and risk for osteoporosis (n = 231; χ^2 P = 0.004). SES, socioeconomic status.

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