

Long-Term Physical Activity and Risk of Age-Related Cataract

A Population-Based Prospective Study of Male and Female Cohorts

Jinjin Zheng Selin, MSc,¹ Nicola Orsini, PhD,¹ Birgitta Ejdermik Lindblad, MD, PhD,^{1,2,3} Alicja Wolk, DMSc¹

Objective: To examine the association of total and specific types of physical activity, including walking or bicycling, exercising, work or occupational activity, home or housework, and leisure time inactivity with the risk of age-related cataract in women and men.

Design: Population-based prospective cohort study.

Participants: A total of 52 660 participants (23 853 women and 28 807 men) 45 to 83 years of age from the Swedish Mammography Cohort and the Cohort of Swedish Men.

Methods: Physical activity was assessed using a self-administered questionnaire at baseline. Cataract diagnosis and extraction were identified through linkage to registers.

Main Outcome Measures: Incident age-related cataract diagnosis and cataract extraction.

Results: During a mean 12.1 years of follow-up (between January 1, 1998, and December 31, 2011; 634 631 person-years), 11 580 incident age-related cataract cases were identified. After adjusting for potential confounders, the highest quartile of total physical activity was statistically significantly associated with 13% decreased risk of cataract compared with the lowest (hazard ratio [HR], 0.87; 95% confidence interval [CI], 0.82–0.92). Walking or bicycling (>60 minutes/day vs. hardly ever; HR, 0.88; 95% CI, 0.82–0.95) and work or occupational activity (heavy manual labor vs. mostly sitting; HR, 0.84; 95% CI, 0.78–0.91) also were associated with decreased risk of cataract. Exercise training and home or housework were not associated with cataract risk. Leisure time inactivity was associated with increased risk of cataract (>6 vs. <1 hours/day; HR, 1.27; 95% CI, 1.07–1.50). The HR for high long-term total physical activity compared with low levels both at 30 years of age and at baseline was 0.76 (95% CI, 0.69–0.85).

Conclusions: Our findings indicate that high total physical activity, especially in the long term, and such specific types of physical activity as walking or bicycling and work or occupational activity, may be associated with decreased risk of age-related cataract. Conversely, high inactivity levels may be associated with increased risk of cataract. *Ophthalmology* 2015;122:274–280 © 2015 by the American Academy of Ophthalmology.

Age-related cataract is the leading cause of visual impairment worldwide.¹ The cause of cataract is multifactorial and may involve oxidative stress.² Because the only treatment of cataract today is surgical removal of the lens (extraction), it is of particular importance to identify protective factors as well as risk factors for cataract.

Regular, moderate physical activity is associated with health benefits such as improved lipid profiles³ and reduced oxidative stress and inflammation levels.⁴ It also has been reported as a protective factor for many chronic diseases, including diabetes and coronary heart disease.^{3,5} Conversely, physical inactivity has been associated with higher levels of oxidative stress^{6–8} and increased risk of a variety of diseases.⁵ However, less is known about the association between physical activity and risk of age-related cataract.

Two previous prospective cohort studies, both in physically active populations, have observed that higher levels of

moderate (walking)⁹ and vigorous (running)^{9,10} physical activity were associated with decreased risk of cataract in men^{9,10} and women.⁹ Moreover, in a case-control study conducted at a hospital setting, lower physical activity levels were associated with increased risk of cataract.¹¹ However, to our knowledge, no previous study has examined (prospectively) the association of total and specific types of physical activity, including both exercise-related and non-exercise-related activities, as well as inactivity, with the risk of age-related cataract in a general population. The aim of this study therefore was to investigate, in 2 large population-based cohorts, the associations of total and specific types of physical activity, including walking or bicycling, exercising, work or occupational activity, home or housework, and leisure time inactivity with the risk of age-related cataract in women and men. Furthermore, we also examined the association of long-term total physical activity by

combining physical activity levels during young adulthood (age 30 years) and later in life (at baseline) with risk of cataract.

Methods

Study Population

This study includes women and men from the population-based, prospective Swedish Mammography Cohort and the Cohort of Swedish Men. The aim of these cohorts was to study major chronic diseases, including age-related cataract. The Swedish Mammography Cohort was established from 1987 through 1990. All women born between 1914 and 1948 and residing in Uppsala and Västmanland Counties in central Sweden received a mailed questionnaire regarding diet and lifestyle factors; 74% of the women responded. A second follow-up questionnaire was sent in late fall 1997 to the women, 48 to 83 years of age, who were alive and still living in the study area; 70% responded. General characteristics of nonparticipants and participants were compared using data from the 1987 and 1997 questionnaires and did not differ substantially (e.g., mean age, 54 vs. 53 years; and body mass index, 25.1 vs. 24.5 kg/m²). The Cohort of Swedish Men was established in late fall 1997. All men 45 to 79 years of age living in Örebro and Västmanland Counties in central Sweden were sent a questionnaire regarding diet and lifestyle questions; 49% of the men returned the questionnaire. The participants in these cohorts well represent the Swedish population of middle-aged and elderly women and men according to distribution of age, smoking habits, body mass index, education level of more than 12 years, and prevalence of hypertension during the study period.¹²

In this study, we excluded participants with a missing or erroneous personal identity number ($n = 448$), those who turned in a blank questionnaire ($n = 92$), those who died before January 1, 1998 ($n = 97$), and those with a previous cancer diagnosis other than nonmelanoma skin cancer ($n = 4309$; identified through linkage to the Swedish National Cancer Register). To avoid potential changes in lifestyle factors, we also excluded participants with a history of cardiovascular disease ($n = 7989$; identified through linkage to the National Inpatient and Outpatient Registers at the National Board of Health and Welfare) or diabetes ($n = 4924$; identified through the National Inpatient and Outpatient Registers at the National Board of Health and Welfare and self-reported data from the questionnaire), as well as those with cataract diagnosis or extraction before baseline ($n = 1103$) and those with missing information on baseline physical activity ($n = 18\ 167$), leaving a total of 52 660 participants (23 853 women and 28 807 men) for the analysis. Cataract incidence was similar among participants excluded because of missing information on physical activity (23.5%) compared with the final study cohort (22.0%).

This study was approved by the Regional Ethical Board at Karolinska Institutet (Stockholm, Sweden), and completion of the questionnaire was considered to imply informed consent to participate in this study.

Assessment of Physical Activity

Information on physical activity levels at baseline was assessed by a self-administered questionnaire with 6 questions about physical activity and inactivity habits during the previous year. The specific types and predefined time spent (5–6 alternatives) on different physical activities included walking or bicycling (hardly ever to more than 1.5 hours daily), leisure time exercise (less than 1 hour to more than 5 hours weekly), work or occupational activity (mostly sitting to heavy manual labor), home or housework (less

than 1 hour to more than 8 hours daily), and inactive leisure time, for example, reading or watching TV (less than 1 hour to more than 6 hours daily). There was also an open-ended question on duration of sleep and sitting or lying down daily. The questionnaire also included the same questions regarding physical activity levels at 30 years of age. Activity scores of specific types of activities were calculated by multiplying the intensity, defined as metabolic equivalents (MET; kilocalories per kilograms per hour), by the self-reported duration (in hours).¹³ Total physical activity (24 hours) score at baseline and at 30 years of age then were estimated by adding all specific types of activities together. The questions on physical activity have been validated against 7-day activity records among women and men in this cohort and have been shown to estimate total physical activity satisfactorily (Spearman's rank correlation, 0.6).^{14,15}

Assessment of Confounders

Information on potential confounders was obtained from the self-administered questionnaire completed at baseline. Age was categorized into 5-year categories. Smoking status was categorized as never, past, or current smokers. Abdominal obesity was defined as waist circumference of 80 cm or more (for women) and 94 cm or more (for men). The questionnaire also included information regarding educational level (less than 9 years, 9–12 years, or more than 12 years), use of corticosteroids (yes or no) and dietary supplements (yes or no), as well as fruit and vegetable and alcohol intake (grams per day). Participants with a history of hypertension were identified through linkage to the National Inpatient and Outpatient Registers at the National Board of Health and Welfare and through self-reported data from the questionnaire.

Ascertainment of Cases and Follow-up

We identified 11 580 incident age-related cataract cases during follow-up between January 1, 1998, and December 31, 2011. Cases were defined as women and men with cataract diagnosis, cataract extraction, or both identified through linkage to the National Outpatient and Inpatient Registers at the National Board of Health and Welfare (International Classification of Diseases, 10th edition, code H25 and operation codes CJC, CJD, CJE, and CJG). We also matched against cataract extraction registers from both public and private clinics in the study area and with the Swedish National Cataract Register, which covers approximately 97% of all cataract extractions in Sweden.¹⁶ Women and men with cataracts that were considered to be congenital or secondary to ocular trauma, intraocular inflammation, or previous intraocular surgery were not included in this study (International Classification of Diseases, 10th edition, code H26).

According to the Swedish National Cataract Register, the median preoperative best-corrected visual acuity in the cataract eye during the study period was 20/50 Snellen equivalent (corresponding to reading difficulties). The median preoperative visual acuity in the nonoperated eye was 20/30 Snellen equivalent.¹⁶ Information on date of death for follow-up was obtained through linkage to the Swedish Death Register.

Statistical Analysis

We calculated hazard ratios (HRs) with 95% confidence intervals (CIs) using a Cox proportional hazards model to assess the association of total and specific types of physical activity with the risk of age-related cataract. Person-years of follow-up for each participant were calculated from baseline (January 1, 1998) until the date of cataract diagnosis, cataract extraction, death, or end of follow-up (December 31, 2011), whichever occurred first. The first model

Download English Version:

<https://daneshyari.com/en/article/6199317>

Download Persian Version:

<https://daneshyari.com/article/6199317>

[Daneshyari.com](https://daneshyari.com)