

# Anthropometry, physical activity, and endometrial cancer risk: results from the Netherlands cohort study

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## ANTHROPOMETRY, PHYSICAL ACTIVITY, AND ENDOMETRIAL CANCER RISK: RESULTS FROM THE NETHERLANDS COHORT STUDY

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Obesity has been identified as a major risk factor for endometrial cancer in many studies. Evidence, however, with respect to height, body mass in adolescence, weight change since adolescence, and physical activity is less extensive<sup>(1)</sup>. In 1986, the Netherlands Cohort Study on Diet and Cancer was initiated. A self-administered questionnaire on dietary habits and other risk factors for cancer was completed by 62,573 women. Data were processed and analyzed using the case-cohort approach, enumerating the cases for the entire cohort, and estimating the person years at risk in the cohort, using a subcohort<sup>(2)</sup>. Follow-up for cancer was established by annual record linkages with the Netherlands Cancer Registry<sup>(3)</sup>. After 9.3 years of follow-up, 226 incident cases of invasive epithelial endometrial cancer and 1739 subcohort members (with an intact uterus at baseline and complete data on anthropometry and confounders) were available for analysis. Rate ratios (RRs) and corresponding 95% confidence intervals (95% CI) were estimated using Cox proportional hazard models. Multivariate RRs were adjusted for age, age at menarche, use of oral contraceptives, age at menopause, parity, cigarette smoking, body mass index (BMI) (in the models for height and physical activity), and physical activity (in the models for BMI).

In multivariate analysis and compared to women with a BMI between 20 and 23 kg/m<sup>2</sup>, the RRs of endometrial cancer with BMI up to 25, 27, 30, and >30 kg/m<sup>2</sup> were 1.55, 1.93, 2.17, and 4.50, respectively (95% CI for the top category, 2.62–7.72; *P* for trend <0.01). The RR of endometrial cancer with a body mass of 20 kg/m<sup>2</sup> or less at baseline was 1.41 (95% CI, 0.60–3.30). The risk of women taller than 175 cm compared to women shorter than 160 cm was 2.57 (95% CI, 1.32–4.99) with *P* trend = 0.09. BMI at age 20 of years was weakly associated with risk of endometrial cancer. Women with

a body mass at age 20 of years of 20 kg/m<sup>2</sup> or less had a RR of 0.67 (95% CI, 0.45–0.98) compared to women with a BMI between 20 and 23 kg/m<sup>2</sup>. A BMI of 25 kg/m<sup>2</sup> and higher at age 20 of years was associated with a RR of 1.33 (95% CI, 0.77–2.30). Gain in BMI since age 20 of years is positively associated with risk of endometrial cancer. Women with a lower BMI at baseline compared to age 20 of years experienced a decreased risk (RR 0.50; 95% CI, 0.25–0.97) compared to women with no or only a small increase in body mass (0–<4 kg/m<sup>2</sup>). For women with an increase of BMI of 8 kg/m<sup>2</sup> or more had a RR of 2.38 (95% CI, 1.48–3.84) compared to the same reference category. Higher physical activity was associated with a decreased risk of endometrial cancer. Compared to women who spent less than 30 min per day on recreational physical activity, the RRs of endometrial cancer for recreational activity up to 60, 90, and >90 min per day were 0.81, 0.59, and 0.54 (95% CI for the top category, 0.34–0.85; *P* trend, 0.002). Daily biking and walking explained most of the observed effect of physical activity.

Height at baseline and BMI at age 20 of years are possibly related to an increased risk of endometrial cancer. Gain in body mass since age 20 and BMI at baseline are strongly associated with an increased risk, and physical activity is associated with a decreased risk of endometrial cancer<sup>(4)</sup>.

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