

Abstract

Study question: Is recreational and residential sun exposure associated with risk of endometriosis?

Summary answer: Tanning bed use in early adulthood, sunscreen use and history of sunburns were associated with a greater risk of endometriosis; however, higher residential UV exposure was associated with a lower endometriosis risk.

What is known already: Previous research has reported an association between endometriosis and skin cancer, with evidence of shared risk factors between the two diseases. We investigated the potential associations between ultraviolet radiation and endometriosis risk.

Study design, size, duration: The Nurses' Health Study II is a prospective cohort of 116 429 female US nurses aged 25-42 years at enrolment in 1989. Participants completed self-administered biennial questionnaires through June 2015.

Participants/materials, settings, methods: We investigated self-reported measures of recreational sun-exposure and geocoded residential UV exposure in childhood and adulthood in relation to risk of laparoscopically confirmed endometriosis among premenopausal white women. We used Cox proportional hazards models to calculate hazard ratios (HRs) and 95% CIs.

Main results and the role of chance: During follow-up, 4791 incident cases of laparoscopically confirmed endometriosis were reported among 1 252 248 person-years. Tanning bed use during high school/college (≥ 6 times per year vs. never use: HR = 1.19, 95% CI = 1.01-1.40; Ptrend = 0.04) and at ages 25-35 (HR = 1.24, 95% CI = 1.12-1.39; Ptrend \leq 0.0001), number of sunburns during adolescence (Ptrend = 0.03) and percentage of time using sunscreen in adulthood (Ptrend = 0.002) were positively associated with risk of endometriosis. In contrast, residential UV level at birth (highest vs. lowest quintile: HR = 0.81, 95% CI = 0.72-0.92; Ptrend = 0.0001), at age 15 (HR = 0.79, 95% CI = 0.70-0.88; Ptrend \leq 0.0001) and at age 30 (HR = 0.90, 95% CI = 0.82-0.99; Ptrend = 0.21) were associated with a decreased risk of endometriosis.

Limitations, reasons for caution: Self-reported endometriosis diagnosis may be prone to misclassification; however, we restricted our definition to laparoscopically confirmed endometriosis, which has been shown to have high validity compared to medical records.

Wider implications of the findings: Our results suggest that tanning bed use in early adulthood increases endometriosis risk, potentially through a harmful effect of ultraviolet A wavelengths, and that residential UV exposure reduces risk, possibly via optimal vitamin D synthesis. These findings should be investigated further to enhance our understanding of endometriosis aetiology.