

Breastfeeding and the risk of epithelial ovarian cancer in an Italian population

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Abstract

Objectives. Breastfeeding has been inversely related to the risk of ovarian cancer, but results from published studies are inconsistent. In order to provide further information, we analyzed data from a large case-control study conducted in four Italian areas.

Methods. Cases were 1031 women with epithelial ovarian cancer. Controls were 2411 women admitted to the same network of hospitals for a wide spectrum of acute non-neoplastic conditions, unrelated to known risk factors for ovarian cancer.

Results. There were inverse trends in risk with increasing duration of breastfeeding and number of children breastfed, but when parity and several other potential confounding factors were taken into account, no residual association was evident (odds ratio = 1.21 for 17 or more months of breastfeeding and 0.90 for those who had breastfed 4 or more children, as compared to women who had never breastfed).

Conclusions. This study showed an inverse relation between breastfeeding and ovarian cancer risk, which however was accounted for by parity. The analyses by histologic subtypes suggested that a role of breastfeeding would be larger for serous neoplasms in the absence, however, of significant heterogeneity.

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Keywords: Risk factor; Breastfeeding; Ovarian cancer

Introduction

Breastfeeding has been inversely related to risk of ovarian cancer, but the results of published studies are inconsistent. In the Cancer and Steroid Hormone Study, focusing the analysis on 436 cases of epithelial ovarian cancer, parous women who had breastfed for 1–2 months had an odds ratio (OR) of ovarian cancer of 0.6, as compared to women who had never breastfed [1]. Likewise, a pooled analysis of North American data

found that parous women who had ever breastfed had lower risk than women who had not breastfed (OR = 0.73 in hospital-based studies, and OR = 0.81 in the population-based studies) [2]. A Canadian case-control study showed an inverse association with total duration of breastfeeding, and found that pregnancy with breastfeeding appeared to be slightly more protective than pregnancy without breastfeeding [3].

A case-control study from China, a country with low incidence of ovarian cancer, reported an inverse relation between breastfeeding duration and ovarian cancer risk, and a significant inverse trend with increasing number of children breastfed [4].

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Conversely, in a case-control study conducted in three Australian states including 824 cases, and in a Swedish case-control study based on 655 cases, breastfeeding appeared to be unrelated to the risk of ovarian cancer after adjustment for parity [5,6], while in another case-control study from the U.K. based on 235 cases, women who had breastfed for more than 2 years had an increased risk of ovarian cancer [7].

Analyses by histologic subtypes also showed conflicting results: an American case-control study [8] and a Swedish study [6] found no relation between breastfeeding and each histologic subtype of epithelial ovarian cancer. In a case-control study conducted in the USA on 563 cases of epithelial ovarian cancer, breastfeeding was inversely associated with endometrioid/clear cell tumors, but was unrelated to the risk of other subtypes [9]. Moreover, in a Californian population-based case-control study, a longer duration of breastfeeding was significantly and inversely associated with the risk of nonmucinous, but not mucinous, tumors [10].

In order to provide further information on the relation between breastfeeding and risk of epithelial ovarian cancer, we analyzed data from a large case-control study conducted in Italy [11,12].

Methods

The data were derived from a case-control study of ovarian cancer, conducted between January 1992 and September 1999 in four Italian areas: greater Milan; the provinces of Pordenone, Padua, and Gorizia (northern Italy); the province of Latina (central Italy); the urban area of Naples (southern Italy). The interviewers were centrally trained. Less than 4% of cases and controls approached refused the interview, and the response rates did not vary across hospitals and geographic areas. Cases were 1031 women (median age 56, range 18 to 79 years) with incident (i.e., diagnosed within a year before interview), histologically confirmed ovarian cancer, admitted to the major teaching and general hospitals in the areas under surveillance.

Controls were 2411 women (median age 57, range 17 to 79 years) residing in the same geographical areas and admitted to the same network of hospitals as cases for a wide spectrum of acute, nonneoplastic conditions, unrelated to known or likely risk factors for ovarian cancer. Women were specifically excluded if admitted for hormonal and gynecological diseases, and if they had been ovariectomized. Among controls, 26% had traumatic conditions (mostly fractures and sprains), 28% non-traumatic orthopedic disorders (mostly low back pain and disc disorders), 15% acute surgical conditions (mostly abdominal, such as acute appendicitis or strangulated hernia), and 31% miscellaneous other illnesses (such as eye, ear, nose, throat, and dental disorders).

All interviews were conducted in the hospitals using a structured questionnaire, including information on age, education, and other socio-economic factors, anthropometric variables, smoking habits, alcohol intake, coffee consumption, a validated food frequency section, a problem-oriented medical history, history of cancer in first-degree relatives, gynecological and obstetric data. Information was specifically obtained on age at menarche, menstrual cycle pattern, type and age at menopause, number of births, spontaneous and induced abortions, age at each pregnancy and birth, and breastfeeding for each live birth.

Data analysis

Odds ratios (OR) of ovarian cancer, and the corresponding 95% confidence intervals (CI), were derived using unconditional multiple logistic regression, fitted by the method of maximum likelihood [13]. Two models were considered: the first one including terms for age and center; the second one including further terms for education, parity, oral contraceptive (OC) use, and family history of ovarian/breast cancer in first-degree relatives.

Table 1
Distribution of 1031 cases of epithelial ovarian cancer and 2411 controls^a according to age and selected characteristics (Italy, 1992–1999)

	Cases, No. (%)	Controls, No. (%)	OR (95% CI) ^b
<i>Age</i>			
<35	53 (5.1)	129 (5.3)	–(–)
35–44	130 (12.6)	314 (13.0)	–(–)
45–54	287 (27.8)	615 (25.5)	–(–)
55–64	325 (31.5)	724 (30.0)	–(–)
≥65	236 (22.9)	629 (26.1)	–(–)
<i>Education (years)</i>			
<7	570 (55.7)	1417 (59.4)	1 ^c (–)
7–11	227 (22.2)	620 (26.0)	1.1 (0.9–1.4)
≥12	227 (22.2)	349 (14.6)	1.9 (1.5–2.4)
<i>Parity</i>			
0	184 (17.8)	381 (15.8)	1 ^c (–)
1	196 (19.0)	473 (19.6)	1.1 (0.8–1.5)
2	376 (36.5)	795 (33.0)	1.0 (0.8–1.3)
3	175 (17.0)	454 (18.8)	0.6 (0.5–0.9)
≥4	100 (9.7)	308 (12.8)	0.5 (0.3–0.7)
<i>Oral contraceptive (OC) use</i>			
Never	921 (89.3)	2142 (88.8)	1 ^c (–)
Ever	110 (10.7)	269 (11.2)	0.9 (0.7–1.2)
<i>Duration of OC use</i>			
≥60 months	18 (16.5)	72 (27.3)	0.5 (0.3–0.9)

^a In some cases, the sum does not add up to the total because of missing values.

^b Odds ratios from multiple logistic regression including terms for age, center, education, parity, OC use, and family history of ovarian and breast cancer in first-degree relatives.

^c Reference category.

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