

A record-based evaluation of induced abortion and breast cancer risk (United States)

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Abstract

Objective: Previous studies of induced abortion and breast cancer may have been limited by differential reporting of abortion history. We conducted a population-based case-control study to evaluate abortion (both induced and spontaneous) and breast cancer risk.

Methods: All study subjects were aged 20–69 years and members of Group Health Cooperative of Puget Sound (GHC). Incident invasive breast cancer cases ($n = 138$) were identified from the linkage between the GHC enrollment file and the Seattle-Puget Sound SEER Cancer Registry. Controls ($n = 252$) were randomly selected from GHC enrollment files and matched to cases on age and enrollment period. All subjects had to have been enrolled at GHC for the 2 years preceding diagnosis (cases) or reference (controls) date. The unified medical record of each case was abstracted for pregnancy history, including prior induced and spontaneous abortions, menopause status, height and weight, screening practices, and other risk factors.

Results: Compared to all women who had never had an induced abortion, the multivariate adjusted relative risk of breast cancer in women with an induced abortion was 0.9 (95% confidence interval 0.5–1.6). This risk was similar in parous women, and nulliparous women. There was no association between spontaneous abortion and breast cancer risk.

Conclusions: These results do not support a relation between induced abortion and breast cancer incidence.

Introduction

While some laboratory data appear to support an association between less than full-term pregnancies and breast cancer risk [1], the epidemiologic evidence is not consistent [2, 3]. In general, retrospective studies based upon interviews with cases and controls suggest a weak positive association [4–13]. However, abortion reporting is a sensitive topic [14]; even a modest degree of differential under-reporting of abortions by controls versus cases could readily produce an apparent association of the magnitude shown in prior case-control studies [4, 15, 16]. In contrast, the few follow-up studies generally have not found an increase in risk associated with induced abortions [17–19].

Because of the inconsistencies in published epidemiologic studies of induced abortion and breast cancer risk and the potential for inaccurate self-report, we conduct-

ed a population-based case-control study that exclusively utilized medical records to ascertain abortion history.

Materials and methods

All subjects were enrollees of Group Health Cooperative of Puget Sound (GHC), a health maintenance organization with over 400,000 members in western Washington State. Case subjects were women aged 20–69 years with a new diagnosis of invasive breast cancer diagnosed between 1 January 1994 and 31 December 1994. In addition, to ensure more complete medical records, this study was restricted to women continuously enrolled at GHC for at least 2 years. Breast cancer cases were identified by routine linkage between the GHC enrollment file and the Seattle-Puget Sound Surveillance,

Epidemiology, and End-Results (SEER) Cancer Registry. Controls were matched to cases with respect to age (± 1 year) and enrollment period (± 1 year) but were otherwise selected at random from the enrollment files. Approximately two controls were selected for each case. Controls with a personal history of breast cancer were excluded.

The GHC medical record provides complete documentation of all inpatient, outpatient, and laboratory and diagnostic services. Induced abortions are a covered benefit for all GHC members. The medical records of cases and controls were obtained for review, and masked at the reference date (the date of diagnosis of the case minus 2 months) to maintain abstractor blinding. Using a standardized form the abstractors recorded all reproductive events, including induced abortion history prior to the reference date. For each event the dates of occurrence, outcomes, procedures and source of information were collected. Other information sought from the record included recent height and weight, age and type of menopause, family history of breast cancer, and clinic utilization. In addition to the clinic notes and reports, for most women over 40 years the Baseline Risk Factor Survey of the GHC Breast Cancer Screening Program was available, a self-administered questionnaire sent to GHC women aged 40 and older. This survey provided information on relevant characteristics (abortion was not available from this source). If a record was silent on a procedure or event, we assumed it did not occur.

A total of 167 women with invasive breast cancer met study eligibility requirements. One woman had previously elected not to participate in GHC research, and charts from 28 women were unavailable for review. Altogether, 276 matched controls were selected and 24 had no medical records available for review. Thus 138 cases and 252 controls were available for this evaluation.

Odds ratios and 95% confidence intervals obtained from logistic regression models were used to estimate relative risks [20]. The matched case and control sets were included in conditional models. All analyses also included the following potential confounders: age at first birth (less than 20, 20–24 years, 25–29 years, >30 years), parity (continuous), family history of breast cancer (present, absent, missing), menopausal status (premenopausal, postmenopausal, unknown), body mass (kg/m^2 , continuous for premenopausal, continuous for postmenopausal). Data were considered missing if the record explicitly stated the information was not available. A high proportion of records were missing information on details of induced abortion procedure (83% cases, 82% controls for weeks gestation at the time of abortion).

Results

Women with breast cancer differed from controls with respect to age at first birth, parity, family history of breast cancer, and age at menopause (Table 1).

Induced termination of pregnancy was relatively common and similar among cases (16.7%) and controls (17.5%). Compared to all women who had never had an induced abortion, the estimated relative risk for breast cancer in women with an induced abortion history was 0.9 (95% CI 0.5–1.6) (Table 2). Parous women with a history of induced abortion were at similar risk for breast cancer as nulliparous women (0.9, 95% CI 0.5–1.7 and 0.8, 95% CI 0.1–6.3, respectively). Although

Table 1. Selected characteristics of breast cancer cases and control subjects

Characteristic	Cases (n = 138)		Controls (n = 252)	
	No.	Percentage	No.	Percentage
Age (years)				
30–39	9	7	17	7
40–49	34	25	72	29
50–59	42	30	78	31
60+	53	38	85	34
Race				
White	102	74	207	82
Non-white	13	9	15	6
Unknown	23	17	30	12
Age of first birth (years)				
<20	22	16	38	15
20–29	59	43	123	49
>30	17	12	24	10
Unknown	40	29	67	27
Parity				
0	25	18	41	16
1–2	60	43	120	48
3–4	42	30	73	29
>5	11	8	18	7
Menopausal status				
Pre-	40	29	78	31
Post-	84	61	144	57
Unknown	14	10	30	12
Family history of breast cancer				
Yes	26	19	31	12
No	98	71	194	77
Unknown	14	10	27	11
Number of clinical examinations ^a				
0	6	4	14	6
1–4	27	20	61	24
≥ 5	104	75	176	70

^a Visits to primary or specialty care clinic during 2-year period prior to diagnosis (cases) or index date (controls). Excludes one case and one control with missing data.