Original Article

Risk of Ovarian and Cervical Cancer in Women with Positive Cancer Family History: Results of Tabari Cohort Study

Abstract

Aim and Background: Positive association between cancer family history and cervical/ovarian cancer could be due to genetic susceptibility or shared environment. The aim of the present study was to identify the association between positive cancer family history and risk of ovarian and cervical cancer. **Materials and Methods:** In the present case–control study, we have utilized the data collected in the enrollment phase of population-based Tabari cohort study. The case group consisted of participants with ovarian and cervical cancer (17 and 39 individuals, respectively) were selected by the census method. Participants in control groups were matched by age and were selected randomly from the study population. Participants in the control group were twice as participants with cervical cancer and three times as participants with ovarian cancer. **Results:** There was no association between ovarian cancer family history and other kinds of cancer family history with ovarian cancer (*P* value: 1.000, 0.146, respectively). Our finding showed no association between cervical cancer family history as well as other kinds of cancer family history with ovarian cancer ovarian (*P* value: 0.439 and 0.713, respectively). **Conclusions:** The findings of the present study showed that there is no significant association between cancer family history with ovarian cancer as well as cervical cancer. Among our selected variables, menopause and residency were significantly associated with ovarian and cervical cancer.

Keywords: *Cervical cancer, family history, ovarian cancer*

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Introduction

Gynecological neoplasm accounts for one-third of malignancies in women.[1] Ovarian cancer is the seventh diagnosed cancer among women worldwide.[2] Although the underline mechanism of ovarian cancer has not been clearly understood, cancer family history is one of the significant risk factors for ovarian cancer. The results of other studies have shown that individuals with first-degree relatives, particularly at early age onset and those with two or more first-degree relatives have increased risk of ovarian cancer.[2-4] On the other hand, the prevalence of cervical cancer varies geographically. In low- and middle-income countries, cervical cancer is the second most common cause of death, and it considered as a largely preventable cancer.[5-7]

A positive association between cancer family history and cervical/ovarian cancer could be due to genetic susceptibility or shared environment, although the finding of literature review has shown an increased risk for dizygotic twins and full blood relatives suggesting an important role of genetic factors in the etiology of the disease.[8,9]

The identification of individuals with cancer family history is one valuable way to decrease the burden of cancer. These individuals may benefit from earlier age screening.[2]

The incidence of cervical cancer in Iran is low, but its risk factor is prevalent.[8] In addition to that association between ovarian and cervical cancer with a family history have been examined in previous studies, but our knowledge about the relationship between all kinds of cancer family history and cervical/ovarian cancer are limited. The aim of the present study was to identify the association between positive cancer family history (ovarian/cervical and all kind of cancers) and risk of ovarian and cervical cancer.

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Materials and Methods

In the present case–control study, we have utilized the data collected in the enrollment phase of population-based Tabari cohort study (TCS). This cohort is a part of the national mega cohort name "Prospective Epidemiological Research Studies in Iran" (PERSIAN) cohort. Rationale, objectives, and design of the PERSIAN cohort as well as TCS have been explained in detail elsewhere.[9-11] TCS was approved by the Research Ethics Committee of Mazandaran University of Medical Sciences (IR. MAZUMS. REC.1395.2524).

Study population

Briefly in the enrollment phase of TCS, 10255 participants aged 35–70 years (7012 from the urban region and 3243 participants from the mountainous region) were recruited from Sari, Mazandaran, and Iran.

In the present study, the case group consists of participants with ovarian cancer (17 individuals) and participants with cervical cancer (39 individuals) who were selected by the census method. Participants in control groups were matched by age and were selected randomly from the study population. Participants in the control group were twice as participants with cervical cancer and three times as participants with ovarian cancer.

Data collection methods

A structured questionnaire which was standardized by the PERSIAN cohort team was used in the present study. A different section of the questionnaire includes participants' demographic information, socioeconomic status, type of home fuel used, lifestyle, reproductive history, occupational history, history of chronic diseases, familial history, oral health, sleep status, physical activity, smoking and drinking habits, food frequency, use of food supplements, dietary habits, and exposure to pesticides. Regarding cancer, history subjects answered questions about having ovarian and cervical cancer, as well as the age of diagnosis. Family history of cancers (ovarian, cervical, and any kind of cancer) in the first and second degree of relatives was asked from all participants.

Statistical analysis

Data were analyzed using the SPSS software version 24.0 (IBM Corp., Armonk, NY, USA) and Stata 14.0 software (StataCorp LP, College Station, TX, USA). The data were described as percentage, mean, and standard deviation. Furthermore, the Chi-squared test was used to match the variables in the case and control group. We compare the family history of cancer in the case and control group using Chi-squared. Confounding variables were adjusted using the multivariable logistic regression. $P < 0.05$ was considered statistically significant.

Results

Ovarian cancer

Among the study population, 17 individuals have had a history of ovarian cancer. Table 1 shows the association between selected variables with ovarian cancer. Among them, menopause and residency were significantly associated with ovarian cancer (*P* value: 0.045 and 0.003, respectively).

None of individuals with ovarian cancer reported ovarian cancer family history in the first or second-degree relatives, whereas in the control group, ovarian cancer family history was reported by one individual. There was no association between ovarian cancer family history and other kinds of cancer family history with ovarian cancer (*P* value: 1.000 and 0.146, respectively) [Table 2].

Cervical cancer

Among the study population, 39 individuals have had a history of cervical cancer. Table 3 shows a comparison of some selected variables in participants with and

Table 1: Characteristics of study participants with ovarian cancer and control group

	Case group, *n* (%)	Control group, *n* (%)	*P*
Age (years)			
40-49	7 (20)	28 (80)	1.000
50-59	4 (20)	16 (80)	
60-69	24 (80)	6 (20)	
Residency			
Urban	4 (8.5)	43 (91.5)	0.003
Rural	13 (34.2)	25 (65.8)	
Socioeconomic level			
1	5 (23.8)	16 (76.6)	0.585
2	7 (29.2)	17 (70.8)	
3	2 (16.7)	10 (83.3)	
4	2 (13.3)	13 (86.7)	
5	1 (7.7)	12 (92.3)	
Education			
Illiterate	4 (19)	17 (81)	0.713
1-5 years	7 (28)	18 (72)	
6-12 years	5 (15.6)	27 (84.4)	
University/college	1 (14.3)	6 (85.7)	
Age at first pregnancy			
≥30	15 (19.5)	62 (80.5)	0.658
<30/no gravidity	2 (25)	6 (75)	
Menopause			
Yes	14 (26.9)	38 (73.1)	0.045
No	3 (9.1)	30 (90.9)	
Menarche age			
<13	4 (22.2)	14 (77.8)	0.750
≥13	13 (19.4)	54 (80.6)	
Oral contraceptive usage			
Yes	6 (17.6)	28 (82.4)	0.658
No	11 (21.6)	40 (78.4)	

Table 2: Comparison of prevalence of cancer family history in participants with ovarian cancer and control group

	Case group, *n* (%)	Control group, *n* (%)	*P*
Ovarian cancer family history			
No	17 (20.5)	66 (79.5)	1.000
First-degree relatives	0	1 (100)	
Second-degree relatives	0	1 (100)	
Other kind of cancer family history			
No	8 (15.1)	45 (84.9)	0.146
Yes	9 (28.1)	23 (71.9)	

Table 3: Characteristics of study participants with cervical cancer and control group

	Case group, *n* (%)	Control group, *n* (%)	*P*
Age (years)			
40-49	7 (25)	21 (75)	1.000
50-59	17 (25)	51 (75)	
60-69	14 (25)	42 (75)	
Residency			
Urban	7 (9.1)	70 (90.5)	0.000
Rural	32 (40.5)	47 (59.5)	
Socioeconomic level			
1	17 (32.7)	35 (67.3)	0.171
2	10 (25)	30 (75)	
3	6 (33.3)	14 (66.7)	
4	2 (8.3)	22 (91.7)	
5	4 (18.2)	18 (81.8)	
Education			
Illiterate	18 (29)	44 (71)	0.387
1-5 years	9 (22.5)	31 (77.5)	
6-12 years	10 (28.6)	25 (71.4)	
University/college	2 (10.5)	17 (89.5)	
Age at first pregnancy			
≥30	36 (25)	108 (75)	1.000
<30/no gravidity	3 (25)	9 (75)	
Menopause			
Yes	36 (30)	84 (70)	0.008
No	3 (8.3)	33 (91.7)	
Menarche age			
<13	7 (24.1)	22 (75.9)	1.000
≥13	32 (25.2)	95 (74.8)	
Oral contraceptive usage			
Yes	23 (29.5)	55 (70.5)	0.196
No	16 (20.5)	62 (79.)	

without cervical cancer. Among variables, menopause and residency were significantly associated with cervical cancer (*P* value: 0.008 and 0.000, respectively).

Cervical cancer family history was reported by one individual in the case group as well as the control group. Our finding showed that there was no association between cervical cancer family history as well as other kinds of cancer family history with ovarian cancer ovarian (*P* value: 0.439 and 0.713, respectively), [Table 4].

Discussion

The findings of the present study showed that there is no significant association between cancer family history with ovarian cancer as well as cervical cancer. Among our selected variables, menopause and residency were significantly associated with ovarian and cervical cancer.

The findings of the present study did not show any association between cancer family history and risk of disease which is inconsistent with findings of other studies.[12] It should be mention that the association between positive cancer family history and cervical cancer mostly emphasized squamous cell carcinomas which is the highest prevalent kind of disease. Zelmanowicz *et al*. reported no association between cancer family history and adenocarcinomas.[13] In the present study, we do not have any information about the kind of cancer. Moreover, the low sample size might be another reason for not finding any association. It should be mentioned that a high percentage of our study participants were older than 50 years old; therefore, they might not remember cancer family history precisely.

The results of our study showed that the prevalence of women with both cervical and ovarian cancer was significantly higher in the rural regions. Singh *et al*. consistent with our finding reported all cancer mortality rate was higher in the rural area.[14] According to these findings, the rural-urban continuum is considered as an independent risk factor for cancer mortality.[14,15] These differences can be attributed to low access to screening programs and inadequate treatment.[8]

In the present study, participants were asked about the cancer family history, which can be subject to recall bias and lack of knowledge. Another limitation should be mention is our study design was a population-based study that limited enrollment of participants with a history of cancer.

Conclusions

The findings of the present study showed that there is no significant association between cancer family history with ovarian cancer as well as cervical cancer. Among our selected variables, menopause and residency were significantly associated with ovarian and cervical cancer.

Table 4: Comparison of prevalence of cancer family history in participants with cervical cancer and control group

	Case group, *n* (%)	Control group, *n* (%)	*P*
Ovarian cancer family history			
No	38 (24.7)	116 (75.3)	0.439
First degree relatives	1 (50)	1 (50)	
Other kind of cancer family history			
No	20 (26.7)	55 (73.5)	0.713
Yes	19 (23.5)	62 (76.5)	

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Conflicts of interest

There are no conflicts of interest.

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