

ABSTRACT

Physical activity and diet are modifiable risk factors for most cancers. Previous studies of the association between physical activity, diet and ovarian cancer risk have yielded mixed results. We evaluated the association between physical activity, diet and ovarian cancer risk among 578 ovarian cancer cases and 7188 non-cancer controls in the Global Epidemiology Study (GES). The GES is linked to the Global Repository that houses biomaterial. For ovarian cancer, newly diagnosed subjects provided informed consent and were asked about physical activity and diet during in-person interviews. The multivariate-adjusted odds ratio (OR) was 0.6 (95% confidence interval (95% CI): 0.5-0.8) for women who reported physical activity greater than 160 minutes per week after adjusting for age, race, BMI and pack-years of smoking compared to women who reported less than 30 minutes of physical activity. Women who were in the highest tertile of vegetables consumers were at 20% reduced risk for ovarian cancer compared to the lowest tertile [OR: 0.6, 95% CI: 0.5-0.8]. However for meat consumption, individuals who were in the highest tertile were at 60% increased risk for ovarian cancer compared to the lowest tertile [OR: 1.6, 95% CI: 1.3-2.0]. Results from our study suggest that physical activity and diet are modifiable risk factors for ovarian cancer.

STUDY AIM

The objective of this study is to examine the association between physical activity, diet and risk of ovarian cancer.

METHODS

The Global Epidemiology Study: The Global Epidemiology Study (GES) is a multinational study to assess disease risk factors. Subjects were recruited to the GES from countries including the United States, Tunisia and Poland. The GES is linked to the Global Repository that houses biomaterial. For ovarian cancer, newly diagnosed subjects provided informed consent and were asked about diet and physical activity during in-person interviews using the same survey instrument.

Participants: We examined the association between diet and breast cancer risk among 578 cancer cases and 7,188 cancer-free controls.

Covariate Data: Data from the baseline questionnaire and medical assessment included data on age, race, diet, physical activity, cancer family history, cancer histology, cancer stage, tumor receptor status and lymph node involvement.

Statistical Analyses:

- Cross tabulations with Chi square tests and t-tests were conducted to determine the association between cancer status and potential confounders.
- Unconditional logistic regression was used to compute odds ratios (ORs) and 95% confidence intervals (CIs). The variables used in the multivariate analyses were age, pack-years of smoking and BMI (continuous variables) and race (categorical).
- Potential confounding of the association between diet and cancer risk was explored using Spearman rank correlation analyses and multivariate logistic regression models, including stepwise regression models. If the potential confounder caused a >20% change in the b coefficient, it was kept in the model for further analyses.
- All p-values shown are 2-sided.
- All statistical analyses were performed using STATA statistical software (STATA Corporation, College Station, TX).

RESULTS

Table 1: Crosstabs of Demographics and Health Behavior Indicators

CHARACTERISTIC	CONTROLS (N=7188)	CASES (N=578)	P-VALUE
Age (Years)*	52	58.5	<0.0001
Smoking No Yes	4729 (65.83%) 2455 (34.17%)	359 (62.22%) 218 (37.78%)	<0.2
Smoking pack years*	5.01 [11.62]	7.96 [15.16]	<0.0001
Alcohol No Yes	5522 (77.25%) 1625 (22.73%)	463 [80.24%] 114 [19.76%]	<0.3
Alcohol drinks number ¹	2	1	<0.008
Vegetables (servs/day) ¹	2	2	<0.009
Fruits (servings/day) ¹	1	2	<0.003
Wholegrains (servs/day) ¹	1	2	<0.02
Dairy prod. (servs/day) ¹	2	1	<0.003
Red meat (Times/week) ¹	2	3	<0.0001
Fish (Times/week) ¹	1	1	<0.003
BMI kg/m ² ¹	25.56	25.60	<0.9
Physical activity (Times/week) ¹	3	2	<0.0006
Physical activity total (Mins/week) ¹	90	60	<0.03

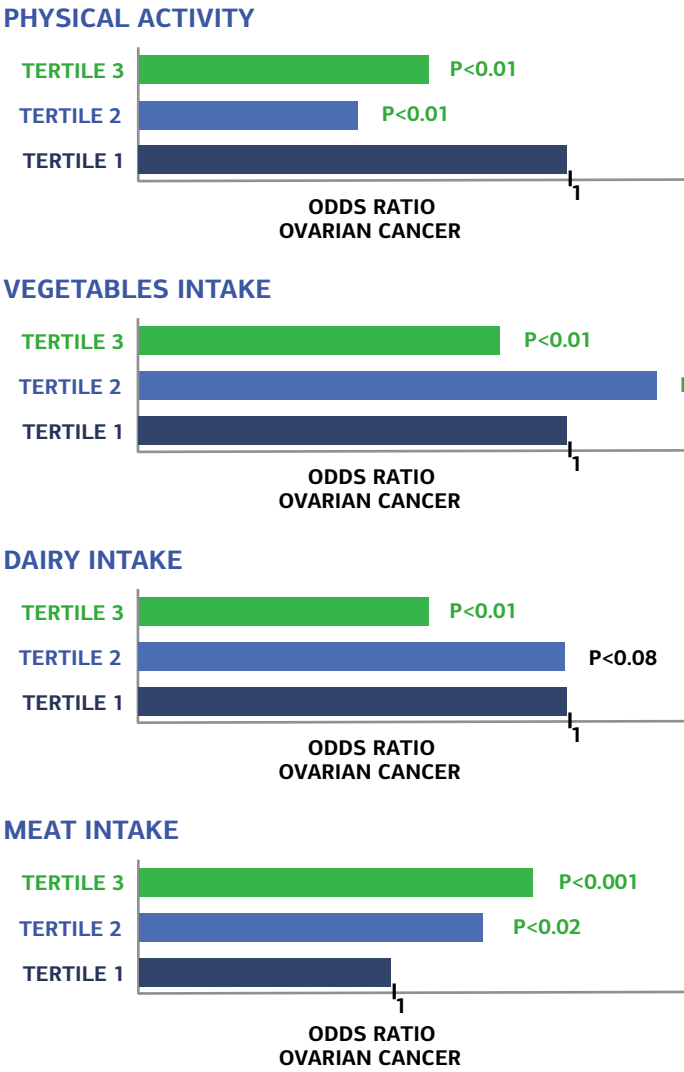
*Mean [Standard Deviation]
¹Median Shown

Table 2: Physical Activity and Diet Ovarian Cancer Risk

	OVERALL OR (95% CI) [^{CASES} / _{CONTROLS}]
Physical Activity (Mins/week)* Tertile 1: <30 mins Tertile 2: 30-150 mins Tertile 3: >150 mins	1.0 (ref) [254/2542] 0.42 (0.33-0.53) [129/2260] 0.61 (0.50-0.76) [164/2311] P_{trend}<0.001
Vegetable (Servs/day)* Tertile 1: <1 Tertile 2: 1-2 Tertile 3: >2	1.0 (ref) [216/2676] 1.21 (0.99-1.48) [222/2269] 0.79 (0.63-0.99) [140/2243] P_{trend}<0.07
Dairy prod. (Servs/day)* Tertile 1: <1 Tertile 2: 1-2 Tertile 3: >2	1.0 (ref) [272/3384] 0.97 (0.79-1.18) [187/2159] 0.58 (0.45-0.76) [79/1624] P_{trend}<0.001
Red meat (Times/week)* Tertile 1: <1 Tertile 2: 1-2 Tertile 3: >2	1.0 (ref) [133/2681] 1.39 (1.08-1.81) [131/1578] 1.59 (1.27-1.98) [296/2917] P_{trend}<0.001

p-value for trend estimated from logistic regression models.
Odds Ratios adjusted for age, smoking pack-years and exercise minutes per week. The overall model was also adjusted for race.

Figure 1: Physical Activity, Diet and Ovarian Cancer Risk



CONCLUSIONS

Increased physical activity was associated with reduced risk of ovarian cancer after adjusting for age, race, smoking and BMI. Vegetable and dairy intake was also associated with reduced risk of ovarian cancer after adjusting for age, race, smoking and BMI. However, for meat we observed a dose response increase in risk of ovarian cancer. Results from our small cross-sectional study suggest that physical activity and diets rich in vegetable and dairy products may reduce ovarian cancer risk.