

Evaluation of socio-economic and immune factors related to endometrial cancer

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Abstract

PURPOSE/OBJECTIVES: Endometrial cancer (EC) is the most commonly diagnosed malignancy of the female genital tract with approximately 3% of women being diagnosed with EC at some point during their lifetime. Well established risk factors for type 1 EC, which makes up ~80% of ECs, include obesity and tobacco use. Recent studies suggest that socio-economic factors, such as race, rural residence, insurance status and income, also correlate to morbidity and mortality associated with EC. Furthermore, obesity and low socioeconomic status have been shown to correlate with a pro-inflammatory phenotype, with elevated levels of C-reactive protein and interleukin-6, two commonly measured systemic inflammatory markers. An imbalance of immunotolerant regulatory T cells (Treg) and T helper cells (Th17) has been characterized in diseases such as diabetes and cancer. We sought to further evaluate the relationship between cancer grade and stage, peripheral immune phenotypes, BMI, and socio-economic status, including rural vs. urban location, income, education level, insurance status and tobacco use. We hypothesized that socio-economic factors correlate with altered inflammatory profiles (elevated Th17:Treg ratio) and subsequent higher stage and/or grade of EC at the time of surgery.

METHODS: This study was approved by the local IRB under protocol #16-493. Women scheduled for surgery, with biopsy confirmed EC or benign gynecologic conditions (controls), were enrolled within SIU School of Medicine, Department of Ob/Gyn, Division of Gynecologic Oncology. All eligible women who consented completed a questionnaire including socio-demographic data. Pathological analysis was performed at the time of surgery based on primary tumor samples and peripheral blood was collected to assess immune cell populations via FACS analysis. Wilcoxon rank sum test, Spearman coefficient and Cochran Armitage trend test were used for statistical analysis.

RESULTS: Our data did not show any significant differences in EC stage or grade at time of surgery based on income, education level, insurance type or tobacco use. We observed a significant immune shift toward a pro-inflammatory phenotype, as seen by the elevated Th17:Treg ratio, in peripheral blood from EC patients compared to control patients (3.50 ± 0.40 vs. 1.74 ± 0.32 , respectively; P-value=0.031). Our data also confirmed significantly higher BMIs in EC patients compared to control subjects (P-value=0.003). We were not able to identify any correlations between the ratio of Th17:Treg and insurance status, tumor grade, BMI, income or education level.

CONCLUSIONS: While our data failed to show any significant correlations between socio-economic status and inflammatory phenotypes or EC stage/grade, one major limitation of our study is the small sample size (58 patients) and the fact that all subjects were enrolled at a single institution. Our data confirms previous studies indicating obesity is associated with EC and shows the presence of a pro-inflammatory phenotype in EC patients. More data are needed to further evaluate this phenotype and its impact on cancer progression.