Impact of distance to travel in cervical cancer outcome: National Cancer Database Study

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Abstract: Cervical cancer is the most common type of gynecological cancer but one of the most preventable and treatable cancer. Studies have investigated risk factors associated with higher cervical cancer incidence and mortality. In addition to getting older, being black, living in south, less income, less education, having comorbidity, stages of cancer, and insurance have reported as risk factors for the incidence and mortality of cervical cancer. Studies also reported the possible impact of distance to cancer care facilities on cervical cancer outcomes with varying results. In this study, we explore the impact of distance travelled on cervical cancer outcomes in addition to exploring potential factors that affect cervical cancer outcomes including cervical incidence and mortality rate, and five-year survival rates. This study aims to assess five-year cervical cancer survival, data were obtained from the National Cancer Database (NCDB) years 2004-2017, only from cervical cancer patients with a minimum 5-year follow-up. Women with races other than White or Black were excluded from the study. Hispanic origin was not distinguished. Multivariate logistic regression model was used to assess the relationship between distance travelled to treatment center and five-year survival. SAS version 9.4 was used for statistical analysis.

Out of the 50,582 patients that met the study criteria, 79.1% were White and 13.5% had stage III/IV disease. Insurance type included private insurance (56.2%), Medicaid (18.2%), and Medicare (13.2%); 9.5% were uninsured or had an unknown insurance. Distance between residence zip code and treatment center was distributed as less than 50 miles (80.1%), more than 50 miles (13.1%), and unknown (6.8%). 95.6% patients were from urban areas, 1.5% from rural areas, and 2.9% had an unknown rural-urban status. Travel of more than 50 miles was associated with race ($P <0.0001$), insurance ($P <0.0001$), facility type ($P <0.0001$), stage ($P <0.0001$), age ($P <0.0001$), geographic location ($P <0.0001$), income ($P <0.0001$), education ($P <0.0001$), and rural-urban status ($P <0.0001$). White, Medicaid insured, academic/research program facility, stage I, younger age, those who lived in the South, income <\$50,353, less education and rural residents were more likely to travel more than 50 miles to treatment facility. In the adjusted logistic regression model for five-year survival, distance ($P=0.0485$), insurance ($P <0.0001$), facility type ($P <0.0001$), comorbidity ($P <0.0001$), stage ($P <0.0001$), age ($P <0.0001$), geographic location ($P=0.0074$), income ($P=0.0014$), education ($P=0.0194$) and year of diagnosis ($P <0.0001$) were associated with survival. Women living more than 50 miles away from hospital were more likely to have less five-year survival rates than women living in less than 10 miles from hospital (OR=0.82 for white women, OR=0.59 for black women).

Effective screening strategies should be to tailor to women living further away from the treatment facility. Special attention should be given to older, less educated, less income as part of a comprehensive cancer prevention and screening program.

Keywords: *Cervical cancer, National Cancer Database, health disparities, risk factors, rural-urban divide*