**ADT and Dementia in Veterans with Prostate Cancer Treated with Definitive Radiation Therapy**

R. Deka,1 D.R. Simpson,1 A.K. Bryant,2 V. Nalawade,2 R.R. Sarkar,2 R. Mckay,3 J.D. Murphy,2 and B.S. Rose2;

*1University of California, San Diego, La Jolla, CA, 2Department of Radiation Medicine, University of*

*California, San Diego, La Jolla, CA, 3Department of Hematology Oncology, University of California, San Diego, La Jolla, CA*

**Purpose/Objective(s):** There is conflicting evidence on the association between the use of androgen deprivation therapy (ADT) and the risk of developing dementia. Prior observational studies may be prone to selection bias. We hypothesize that there is no association between ADT use and the development of dementia in men with prostate cancer (PC) treated with definitive radiation therapy (RT) after controlling for multiple sources of selection bias.

**Materials/Methods:** This is an observational cohort study of men diagnosed with non-metastatic PC at the United States Department of Veterans Affairs between January 1, 2001 and October 31, 2015 who received definitive RT with or without ADT. Patients with missing covariates, including prostate specific antigen (PSA), Gleason score, clinical T, M, and N stages, and income were excluded. We also excluded patients with a prior diagnosis of mild cognitive impairment, stroke, and dementia or a diagnosis of dementia within one year of PC diagnosis. Finally, patients who initiated ADT more than one year after their PC diagnosis were excluded. Fine-Gray competing risks regression with inverse probability weighting of the propensity score was used to evaluate the association between ADT and the dementia. ADT was measured as a time-varying exposure. The primary outcome was the new development of any form of dementia. Secondary outcomes included vascular dementia and Alzheimer’s disease. Exposure was ascertained from filled prescription records and outcomes from ICD-9 codes. Variables included in the propensity score and Fine-Gray model were age, CCI score, statin use, antiplatelet use, antihypertensive use, alcohol abuse, substance abuse, race, smoking status, region, Gleason score, income, education, clinical T stage, PSA, and year of diagnosis.

**Results:** The cohort included 28,778 men followed for a median of 6.8 years. A total of 17,717 patients received RT alone while 11,061 patients received RT and ADT. During follow-up, 917 patients were diagnosed with dementia (vascular dementia: 208, Alzheimer’s disease: 230, other/unclassified: 479). In the multivariable competing risk model, there was no significant association between ADT and any dementia (SHR=0.96, 95% CI=0.86-1.07, p-value=0.46), vascular dementia (SHR=0.96, 95% CI=0.77-1.22, p-value=0.75), or Alzheimer’s disease (SHR=1.04, 95% CI=0.84, 1.28, p-value=0.79). Furthermore, there was no association between ADT length of <1 year with any dementia (SHR=0.96, 95% CI=0.86-1.09, p-value=0.55) and ADT length >1 year with any dementia (SHR=0.95, 95% CI=0.84-1.09, p-value=0.44).

**Conclusion:** We did not observe an increase in the risk of any dementia, vascular dementia, or Alzheimer’s disease among a large cohort of men with PC who received ADT with definitive RT. These results may mitigate concerns regarding the long-term risks of ADT on cognitive health in the treatment of PC.