**A Comprehensive Review of Incidence and Survival in Patients with Rare Histologic Variants of Prostate Adenocarcinoma in the United States**

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**Purpose/Objective(s):** The American Joint Commission on Cancer (AJCC) identifies five rare variants of prostate adenocarcinoma: mucinous (Muc), ductal adenocarcinoma (DA), signet ring cell (SRC), adenosquamous (AS), and small cell (SmC). Limited information exists on these variants, which presents significant clinical challenges. To the authors' knowledge, no prior study has comprehensively detailed incidence, treatment and outcomes for all AJCC variants of prostate cancer.

**Materials/Methods:** We used the Surveillance, Epidemiology, and End Results (SEER) program to analyze cases of prostate cancer diagnosed from 1973-2007. Cases of Muc (n = 507), DA (n = 598), SRC (n = 124), AS (n = 26), and SmC (n = 335) were identified. For comparison, cases of non-variant adenocarcinoma (A) (n = 737,262) were also identified. Incidence rates (IRs), initial treatment, and survival were stratified by race and stage. All IRs represent the number of cases per million/year.

**Results:**Each of these five variant histologies is truly rare. The rarest subtype in our analysis was AS, with an IR of 0.025. The least rare subtype was Muc, with an IR of 0.616. There were differences in IR by race: Muc had an IR of 1.402 in African Americans (AA), compared to 0.563 in whites. The use of radiation therapy (RT) also varied by subtype. Thirty two percent of patients with SmC received RT, compared to 18% in Muc. Overall survival rates (OS) also varied across histologies. The five year OS for Muc, DA, SRC, AS, SmC, and A was 75%, 61%, 60%, 22%, 15%, and 76%, respectively. There were significant differences in OS between white and AA patients for Muc and DA. The 5-year OS for Muc was 77% for whites (95% confidence interval [CI], 73-81%) compared to 64% for AA. For DA, five year OS for AA men was 72%, compared to 59% for whites (95% CI, 54-64%).

**Conclusions:** Our analysis represents the most comprehensive report of rare prostate cancer histologies to date. There are notable differences in IR, IR by race, use of RT, OS, and OS by race among variants. These differences should be considered in clinical decision-making for workup and treatment of patients diagnosed with these malignancies. Further research is needed to explore biological and clinical factors that may account for the difference in outcomes among these variants of prostate cancer.