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[Meta-Analysis](#) [J Urol.](#) 2021 Jan;205(1):60-67. doi: 10.1097/JU.0000000000001341.

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# The Risk of New Onset Dementia and/or Alzheimer Disease among Patients with Prostate Cancer Treated with Androgen Deprivation Therapy: A Systematic Review and Meta-Analysis

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## Abstract

**Purpose:** Androgen deprivation therapy is a standard therapy for some patients with localized and almost all patients with metastatic prostate cancer. Although several clinical cohort studies have identified an impact of androgen deprivation therapy on cognitive function, the previous reviews were not able to perform a well designed quantitative synthesis to summarize the risk of dementia and/or Alzheimer disease. Consequently there is still a lack of systematic review and meta-analysis regarding the impact of this risk including more recent studies.

**Materials and methods:** We conducted a systematic review and meta-analysis of the literature assessing the differential incidence of dementia and/or Alzheimer disease as outcomes in patients with prostate cancer who did vs did not receive androgen deprivation therapy. We queried PubMed® and Web of Science™ databases from January 1 to 3, 2020. We used random or fixed effects meta-analytic models in the presence or absence of heterogeneity per the I<sup>2</sup> statistic. We performed 6 meta-analyses for all cause dementia, Alzheimer disease and all cause dementia or Alzheimer disease according to the duration of androgen deprivation therapy (up to 12 or more than 12 months).

**Results:** A total of 14 studies were selected after considering inclusion and exclusion criteria. Nine of them reported all cause dementia (ie all types of dementia including Alzheimer disease), with 8 reporting Alzheimer disease. Five studies assessed these outcomes according to the duration of androgen deprivation therapy. The risk of new onset dementia (all cause) and Alzheimer disease was higher in patients with prostate cancer who received androgen deprivation therapy compared to those who did not (HR 1.21, 95% CI 1.11-1.33 and HR 1.16, 95% CI 1.09-1.24). The risk of dementia (all cause) was higher in patients with prostate cancer who received androgen deprivation therapy for more than 12 months (HR 1.36, 95% CI 1.07-1.72); however, for those who had less than 12 months of androgen deprivation therapy exposure the difference was not statistically significant 1.06 (95% CI 0.77-1.28). There was no association between the androgen deprivation therapy duration and the risk of Alzheimer disease (HR 1.21, 95% CI 0.97-1.51 for exposure up to 12 months and HR 1.39, 95% CI 0.69-2.79 for exposure greater than 12 months).

**Conclusions:** Men who receive androgen deprivation therapy for prostate cancer have an increased risk of dementia and/or Alzheimer disease compared to men who do not receive androgen deprivation therapy; this was more pronounced when androgen deprivation therapy was given longer than 12 months.

**Keywords:** Alzheimer disease; androgen antagonists; dementia; prostatic neoplasms.

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