

Title: Increased DNA Damage and Oxidative Stress in High-Risk Prostate Cancer Subjects**Author(s): Anmol Kumar****Affiliation:** Undergraduate Student

"In the United States, approximately 191,930 new cases of prostate cancer will be diagnosed and 33,330 deaths will occur in 2020. A major risk factor that contribute to the development of prostate cancer is oxidative stress and oxidant/antioxidant balance. Our goal is to investigate oxidative DNA damage and changes in antioxidant status as risk factor for prostate cancer. A total of 40 men in the age range of 52–84 years without any prior drug or treatment were included in the study. Twenty subjects were selected having precursor high-grade PIN and serum PSA >4.0 ng/mL with abnormality in the prostate. Twenty age-matched men designated as controls were recruited in the study. Blood samples were drawn, buffy coat was separated for DNA isolation. A battery of assays for 8-hydroxydeoxyguanosine (8-OHdG) in leukocytes, plasma antioxidant capacity, guanosine 3',5'-cyclic monophosphate (cyclic GMP), nitrite and nitrate levels, glutathione S-transferase P (GSTP1) and O-6-Methylguanine-DNA Methyltransferase (MGMT) were performed.

A significant increase in the levels of 8-OHdG in the buffy coat and cGMP, nitrite/nitrate was observed ($p < 0.0001$) in the plasma samples of high-risk subjects; whereas the levels of GSTP1 and antioxidant capacity were significantly decreased in high-risk subjects, compared to control. An increase in MGMT activity was also noted in the plasma of high-risk subjects, compared to control subjects.

In conclusion, the increased oxidative stress and changes in antioxidant status may lead to the development of prostate cancer."