

## The Impact of a Prior Haemophilus influenzae Infection in the Incidence of Prostate Cancer

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**Abstract :** Introduction/Background: Haemophilus influenzae is present as a commensal organism in the nasopharynx of most healthy adults from where it can spread to cause both systemic and respiratory tract infection. Pathogenic properties of this bacterium as well as defects in host defense may result in the spread of these bacteria throughout the body. This can result in a proinflammatory state and colonization particularly in the lungs. Recent studies have failed to determine a link between H. Influenzae colonization and prostate cancer, despite previous research demonstrating the presence of proinflammatory states in preneoplastic and neoplastic prostate lesions. Given these contradictory findings, the primary goal of this study was to evaluate the correlation between H. Influenzae infection and the incidence of prostate cancer. Methods: To evaluate the incidence of Haemophilus influenzae infection and the development of prostate cancer in the future we used data provided by a Health Insurance Portability and Accountability Act (HIPAA) compliant national database. We were afforded access to this database by Holy Cross Health, Fort Lauderdale for the express purpose of academic research. Standard statistical methods were employed in this study including Pearson's chi-square tests. Results: Between January 2010 and December 2019, the query was analyzed and resulted in 13, 691 patients in both the control and C. difficile infected groups, respectively. The two groups were matched by age range and CCI score. In the Haemophilus influenzae infected group, the incidence of prostate cancer was 1.46%, while the incidence of the prostate cancer control group was 4.56%. The observed difference in cancer incidence was determined to be a statistically significant p-value ( $< 2.2 \times 10^{-16}$ ). This suggests that patients with a history of C. difficile have less risk of developing prostate cancer (OR 0.425, 95% CI: 0.382 - 0.472). Treatment bias was considered, the data was analyzed and resulted in two groups matched groups of 3,208 patients in both the infected with H. Influenzae treated group and the control who used the same medications for a different cause. Patients infected with H. Influenzae and treated had an incidence of prostate cancer of 2.49% whereas the control group incidence of prostate cancer was 4.92% with a p-value ( $< 2.2 \times 10^{-16}$ ) OR 0.455 CI 95% (0.526 -0.754), proving that the initial results were not due to the use of medications. Conclusion: The findings of our study reveal a statistically significant correlation between H. Influenzae infection and a decreased incidence of prostate cancer. Our findings suggest that prior infection with H. Influenzae may confer some degree of protection to patients and reduce their risk for developing prostate cancer. Future research is recommended to further characterize the potential role of Haemophilus influenzae in the pathogenesis of prostate cancer.

**Keywords :** Haemophilus Influenzae, incidence, prostate cancer, risk.

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