

## The Incidence of Prostate Cancer in Previous Infected E. Coli Population

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**Abstract :** Background: Escherichia coli is a gram-negative, facultative anaerobic bacteria that belongs to the family Enterobacteriaceae and resides in the intestinal tracts of individuals. E.Coli has numerous strains grouped into serogroups and serotypes based on differences in antigens in their cell walls (somatic, or "O" antigens) and flagella ("H" antigens). More than 700 serotypes of E. coli have been identified. Although most strains of E. coli are harmless, a few strains, such as E. coli O157:H7 which produces Shiga toxin, can cause intestinal infection with symptoms of severe abdominal cramps, bloody diarrhea, and vomiting. Infection with E. Coli can lead to the development of systemic inflammation as the toxin exerts its effects. Chronic inflammation is now known to contribute to cancer development in several organs, including the prostate. The purpose of this study was to evaluate the correlation between E. Coli and the incidence of prostate cancer. Methods: Data collected in this cohort study was provided by a Health Insurance Portability and Accountability Act (HIPAA) compliant national database to evaluate patients infected with E.Coli infection and prostate cancer using the International Classification of Disease (ICD-10 and ICD-9 codes). Permission to use the database was granted by Holy Cross Health, Fort Lauderdale for the purpose of academic research. Data analysis was conducted through the use of standard statistical methods. Results: Between January 2010 and December 2019, the query was analyzed and resulted in 81, 037 patients after matching in both infected and control groups, respectively. The two groups were matched by Age Range and CCI score. The incidence of prostate cancer was 2.07% and 1,680 patients in the E. Coli group compared to 5.19% and 4,206 patients in the control group. The difference was statistically significant by a p-value  $p < 2.2 \times 10^{-16}$  with an Odds Ratio of 0.53 and a 95% CI. Based on the specific treatment for E.Coli, the infected group vs control group were matched again with a result of 31,696 patients in each group. 827 out of 31,696 (2.60%) patients with a prior E.coli infection and treated with antibiotics were compared to 1634 out of 31,696 (5.15%) patients with no history of E.coli infection (control) and received antibiotic treatment. Both populations subsequently developed prostate carcinoma. Results remained statistically significant ( $p < 2.2 \times 10^{-16}$ ), Odds Ratio=0.55 (95% CI 0.51-0.59). Conclusion: This retrospective study shows a statistically significant correlation between E.Coli infection and a decreased incidence of prostate cancer. Further evaluation is needed in order to identify the impact of E.Coli infection and prostate cancer development.

**Keywords :** E. Coli, prostate cancer, protective, microbiology

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