Progression of Prostate Cancer and the Influences of the Metabolic Syndrome and Physical Activity: A Trajectory-Based Approach

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Prostate cancer is the most common non-cutaneous cancer in Canadian men with over 21000 new cases (110.4 per 100000 men) per year (CCS, 2017). Once a patient is diagnosed they are assigned a risk level according to their tumor grade, PSA level and Gleason score. Individualized treatment plans are then determined by this attributed risk as well as other prominent risk factors such as age and symptomology. Recently, studies have shown that metabolic syndrome is associated with an increased risk of aggressive prostate cancer incidence and cancer recurrence, whereas higher levels of physical activity are associated with a decreased risk of prostate cancer development. However, the overall impact of these factors are not wholly known with regards to progression of prostate cancer over time. In this study, a prospectively maintained institutional database at Princess Margaret Hospital will be used to identify men who have been diagnosed with prostatic adenocarcinoma between January 1, 2004 and June 30, 2013. A trajectory-based model will then be developed to identify groups of individuals who share similar paths of disease progression over time. Subsequent group-based trajectories will be analyzed to determine commonalities in their clinical profile, including the role of metabolic syndrome and/or physical activity level within the trajectory model. Once carried out, the understanding of these pathways may provide new insights to high risk characteristics which may in turn be used to better manage surveillance and treatment of the disease.