Metabolic profile and the risk of developing prostate cancer

A nested-case control study

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Prostate cancer is the most frequently diagnosed cancer and the second cause of cancer-related death in men. Identifying modifiable risk factors and markers for disease risk are therefore important. Our aim was to identify metabolites associated with risk of prostate cancer using a nested case-control study design i.e. 777 pairs of prostate cancer cases and their matched controls (n = 1554) recruited from Northern Sweden Health and Disease Study Cohort (NSHDC). Metabolites were quantified with targeted MS and NMR-based metabolomics in fasting plasma samples. Association to disease risk was examined using conditional logistic regression conditioned on matching factors (BMI, age and sample storage time), followed with correcting for multiple testing. Statistical analyses were also done after restriction to non-aggressive and aggressive cases and stratification by baseline age. After correction for multiple testing, we identified a positive association between overall disease risk and plasma levels of two lysophosphatidylcholines (i.e., LPC C17:0 and LPC C18:0). The associations were more pronounced in older subjects (60 years), where the association for LPC C17:0 was significant even after Bonferroni correction. For younger subjects (40 and 50 years), glycine levels positively, and pyruvate levels negatively, associated with risk of overall disease. We also identified positive association between aggressive disease risk and plasma levels of six glycerophospholipids, whereas levels of acylcarnitine C18:2 displayed a negative association. A strong association was found for LPC 17:0 and aggressive disease in older individuals, where individuals in the top quartile had a 3.9 fold higher odds of developing aggressive disease.