Plasma Selenium Concentration and Polymorphism of Selenoprotein and Prostate Cancer

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Abstract : Prostate Cancer (PC) is a malignant tumor originated in prostate and is a second common male's cancer in the world. Incidence of PC in Asia countries, have still been rising over the past few decades. As an antioxidant, selenium can slow down prostate cancer tumor progression, but the association between plasma selenium levels and risk of aggressive prostate cancer may be modified by different genotype of selenoprotein. The aim of this study is to determine the relationship between plasma selenium, polymorphism of selenoprotein, urinaty total arsenic, and prostate cancer. Two hundred ninety five pathologically-confirmed cases of PC and 295 cancer-free controls were individually matched to case subjects by age (± 5 years) were recruited from Department of Urology of National Taiwan University Hospital, Taipei Municipal Wan Fang Hospital and Taipei Medical University Hospital. Personal interview and biospeciment of urine and blood collection from participants were conducted by well-trained interviewers after participants' informed consent was obtained. Plasma selenium was measured by an inductively coupled plasma mass. Urinary arsenic concentration was detected using high-performance liquid chromatography-linked hydride generator and atomic absorption spectrometry. The polymorphism of SEPP1rs3797310 and SEP15 rs5859 were determined using polymerase chain reaction-restriction fragment length polymorphism method. The higher plasma selenium was the lower OR of PC with a dose-response relationship. Prostate cancer patients with high plasma selenium had low tumor stage and grade. Participants carried SEPP1rs3797310 CT+TT genotype compared to those with CC genotype had a lower OR of PC in crude model; then this relationship was disappeared after confounder was adjusted. Prostate cancer patients with high urinary total arsenic concentration had high tumor stage and grade. Urinary total arsenic concentration was significantly positively related with plasma selenium and prostate specific antigen concentration. Participants with lower plasma selenium concentration and higher urinary total arsenic concentration compared to those with higher plasma selenium concentration and lower urinary total arsenic concentration had a higher OR of PC with a dose-response relationship.

Keywords : prostate cancer, plasma selenium concentration, urinary arsenic concentration, prostate specific antigen
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