Prostate cancer: A change in circulating tumor cells detection has high potential in the prediction

October 11 2013

A new study reveals that in the prediction of treatment outcome for castration-resistant prostate cancer, a change in circulating tumour cells detection might be more accurate than the change in prostate-specific antigen levels. The findings of this award-winning study were presented at the recent EAU 13th Central European Meeting in Prague.

"The research of the circulating tumour cells (CTC) is of utmost importance, because nowadays there is no reliable marker of both cancer-specific or overall survival in castration-resistant prostate cancer (CRPC) patients," explained the lead author of the study, Dr. Otakar ?apoun, of the Department of Urology at General Teaching Hospital Charles University in Prague, Czech Republic.

"The goal of this study is to assess the possibility of the individualisation of castration-resistant prostate cancer management. In cases with no favourable change in CTC detection during chemotherapy, the early switching to another therapy should be considered," commented ?apoun on the implications of the study, which was supported by the Internal Grant Agency of the Ministry of Health of the Czech Republic.

Protocol of the grant project included the collection of peripheral blood from patients with metastatic CRPC prior to docetaxel therapy and after the fourth cycle of chemotherapy (CTX). Circulating tumour cells were detected by using a method of immunomagnetic separation. In the

course of the study multiplex-PCR was performed after cytolysis of CTC and the expression of tumour-associated antigens (PSA, PSMA and EGFR) was quantified.

The methodology of the study was based on verbal evaluation together with a report of the absolute values (ng/ml). The authors recorded the levels of serum PSA (sPSA) and the fragments of respective antigens before and in the course of CTX and compared the values. They also evaluated the correlation between the change of sPSA and expression of CTC antigens during CTX.

The study included 26 patients with both samples taken in 17 of them. Median age was 72 years (54-82), mean sPSA level before and after CTX was 197.6 and 120.1ng/ml, respectively. Before CTX only 2 out of 26 patients were considered CTC negative, whereas during the CTX the CTC negativity was confirmed in 9 out of 17 cases. Before CTX, positive detection of fragments of antigens for PSA, PSMA and EGFR was confirmed in 23, 16 and 2 patients, respectively, and during CTX in 8, 3 and 1 case, respectively. The sPSA level before CTX was associated with the level of fragments for PSA (p=0.0020) and PSMA (p=00.0147). During CTX the association was seen in all antigens. However neither a change in sPSA level nor a change in positive versus negative CTC statement correlated with a change of any of the tested antigens.

The study concludes that the sPSA level has the most accurate correlation with the level of gene fragment for PSA in CTC. A favourable change in CTC quantity will occur in more than a half of patients during chemotherapy, however the change in CTC detection does not correlate with the change of the sPSA level.

"This research project is divided into several arms, among others, we are investigating the feasibility of CTC cultivation and genetic profiling,"

commented ?apoun referring to the possibility of follow-up research.

"This gene profile will be compared with primary tumour at the time of diagnosis. In the future, this CTC profiling might be useful for even more accurate and better tailored selection of treatment for castration-resistant prostate cancer."

More information: Reference: ?apoun O., et al. Prostate-specific antigen level and detection of circulating tumour cells in castration-resistant prostate cancer, Abstract C163, EAU 13th Central European Meeting.

Provided by European Association of Urology