Androgen metabolism potential correlates with prostate cancer progression

Zemin Hou[1], Shengsong Huang[2], Denglong Wu[2], **Zhenfei Li[1,*].**

[1] State Key Laboratory of Cell Biology, CAS Center for Excellence in Molecular Cell Science, Shanghai Institute of Biochemistry and Cell Biology, Chinese Academy of Sciences; University of Chinese Academy of Sciences, 320 Yueyang Road, Shanghai 200031, P. R. China

[2] Department of Urology, Tongji Hospital, Tongji University School of Medicine, Shanghai 200065, China.

* Co-correspondence author

Background

Androgen sustains prostate cancer development. Androgen metabolism has been thoroughly investigated in cell lines but not in patient tissues. The androgen precursor utilized by prostate cancer is elusive and the androgen metabolism preferable pathway is under debate. Here, the authenticity and significance of androgen metabolism in patients were investigated with patient biopsy samples.

Methods

Biopsy samples from patients with different stages of prostate cancer were collected from *in situ* prostate. One third biopsy samples were used for pathology examination while another one-third biopsy were minced and cultured in medium *in vitro* for up to 84 hr. Different [^{3}H]-labeled androgen precursor were utilized to test androgen metabolism potential. Medium were collected for HPLC analysis. DHEA metabolites were divided into two groups, oxidized DHEA and potent androgens. The percentage of these metabolites was used to evaluate of androgen metabolism potential.

Results

Prostate biopsy tissues preferred DHEA or AD (Androstenedione) as androgen precursors and could hardly metabolize pregnenolone. Significant oxidized-DHEA were found when treated tissues with DHEA, which was rare in cell lines. More potent androgen were generated from biopsy samples of metastatic patients, comparing with benign or localized prostate cancer patients, indicating increasing androgen metabolism potential as disease progression. However, the metabolism potential of peripheral zone was comparable to that of transition zone. DHT could be generated from DHEA through testosterone or 5α-androstanedione in patients with benign, localized prostate cancer or metastatic prostate cancer. Metabolic pathway preference might correlate with steroidogenic potential.

Conclusions

Our findings provides evidence of the clinical significance of *in situ* steroidogenesis. Androgen metabolism increased as disease progression, which might be utilized to distinguish aggressive

prostate cancer from indolent ones.

Conflict of Interest

There is no conflict of interest.

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