

INFECTION

Potential protective role of raised PSA in recurrent UTI

Raised serum PSA is a feature of prostatic inflammation, and is often observed in men with UTI. However, the meaning of this rise has previously been elusive, with suggested mechanisms including increased diffusion from prostatic epithelium and increased reactive secretion. A study to determine whether increased PSA levels are linked to enhanced clearance of infecting organisms, recently published in *Prostate*, brings better understanding of the role of PSA in UTI.

Researchers retrospectively assessed the occurrence of recurrent UTI (rUTI) using patient interviews and also investigated the expression of genes encoding PSA and whey-acid motif 4-disulphide core (WFDC) proteins WFDC2 and SLPI in prostate cell lines. The exact role of WFDC proteins remains unclear, though roles in innate immunity have been identified.

25 men were included in the final analysis, nine of whom had rUTI. Interestingly, men who had rUTI had a median serum PSA level of 2.4 ng/ml at their initial episode,



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compared with 6.3 ng/ml in those who had only a single UTI.

The team then assessed whether bacterial challenge of LNCaP cells affected the expression of PSA, SLPI and WFDC2. Indeed, *E. coli* challenge increased the expression of all three genes, with PSA concentrations increasing within just 1 h of infection. Similar results were also observed during *E. coli* challenge of primary prostatic epithelial monolayers. Using the PSA-negative DU145 cell line, the team showed a potential protective

role of PSA—the invasion frequency of *E. coli* into DU145 monolayers was significantly higher than that of LNCaP cells. Furthermore, co-incubation of SLPI with PSA resulted in SLPI cleavage, which releases antimicrobial moieties and resulted in enhanced *E. coli* killing.

“The phenomenon of raised PSA during male UTI has long been recognised but until now only as a confounder to prostate cancer diagnosis,” corresponding author Judith Hall told *Nature Reviews Urology*. “The linkage of the *in vitro* findings with our clinical data suggesting that men with raised PSA during UTI were less likely to suffer rUTI suggests that there is indeed a protective benefit from this previously disregarded phenomenon.”

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Original article Townes, C. L. *et al.* Prostate specific antigen enhances the innate defence of prostatic epithelium against *Escherichia coli* infection. *Prostate* doi:10.1002/pros.22700