Emerging PSA-Based Tests to Improve Screening

PSA-based testing has been widely used to aid prostate cancer detection since the late 1980s and prostate cancer-specific mortality has been shown to be decreased as a result of PSA-based screening programs in recent years.

Prostate Specific Antigen
As PSA is organ-specific and not prostate cancer-specific there is a considerable degree of overlap in PSA levels between patients with benign pathologies such as prostatitis, benign prostate hyperplasia (BPH) or urinary retention, and patients with prostate cancer. A “normal” level of PSA was previously described as being below 4.0 ng/mL for men aged 50-80 years without prostate disease however in more recent years it has become clear that there is no such thing as a “normal” PSA in terms of prostate cancer risk.

Moreover there is no PSA cut-off threshold below which the risk of detecting a prostate cancer on biopsy is zero and the choice of PSA threshold at which a clinician might recommend a patient biopsy is controversial. If the PSA threshold was to be set too high then clinically significant prostate cancers might be missed – conversely, if it was to be set too low then an unacceptably high number of men without prostate cancer would be subjected to an unnecessary biopsy and thereby be exposed to the inherent risks and anxieties associated with this invasive procedure.

Evolution of the PSA Test
The use of a number of PSA derivatives, such as PSA density, PSA velocity, age-adjusted PSA, free-to-total PSA ratio, and different molecular derivatives of PSA has led to various refinements in the performance of the PSA test.

Despite this, the limited sensitivity and specificity of PSA means that there remains an urgent need to identify prostate cancer biomarkers with better performance characteristics than PSA alone.

The use of PSA derivatives and additional kallikrein markers has the potential to improve upon the current performance characteristics of the PSA test alone. The use of PSA as part of a multivariable approach to early prostate cancer detection, including such tools as the Prostate Health Index test, has recently been supported by the Melbourne Consensus Statement on Prostate Cancer Testing.

Learn more at:
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3989548/