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Editorial

The Cutoff Level of Free/Total Prostate Specific Antigen (f/t PSA) Ratios in the Diagnosis of Prostate Cancer: Current Status and Future Perspectives

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Editorial

PSA is one of the most important biomarkers for detecting prostate cancer and guiding decisions to biopsies of the prostate. Despite its adequate sensitivity, the use of PSA testing is limited by a significant lack of specificity, which can result in unnecessary biopsies. Recent findings emphasize the limitation of these PSA threshold values to discriminate between prostate cancer and benign disease in asymptomatic men [1-3]. Therefore clinicians tried to improve a new diagnostic biomarker for clinically significant PCa. One of the most promising marker is PSA derivates such as free PSA and its ratio to total PSA (%f/t PSA).

Murray et al. compared 3 PSA parameters (%f/t PSA, PSA velocity, and PSA density) in 303 men undergoing initial prostate biopsy and found that %f/t PSA was superior than other PSA parameters with a sensitivity and specificity of 70.8%, and 67.4%, respectively [4].

Use of the f/t PSA ratio has been shown to improve specificity in detection of prostate cancer. No definitive data are available indicating the optimal %f/tPSA that should be applied. Despite the various cutoff levels in the literature, a low%f/t PSA is strongly associated with unfavorable tumor characteristics. Recently published data demonstrated that the cumulative probabilities of Pca detection at 3 years were 64.5, 41.2, 28.5, and 14.3 % for patients with f/t PSA ratio ≤0.08, 0.09–0.13, 0.14–0.22, and ≥0.23, respectively [5]. This was a retrospective study and had several limitations such as biases for time from populations creening to diagnosis. However they showed that f/t PSA ratio was a strong predictor of future cancer detection. Partin et al. suggested using f/t PSA ratio 15%, which would detect all advanced, non-organ confined, and large volume tumors, while avoiding 80% of biopsies in men with insignificant disease, particularly in the intermediate range of total PSA (4.1-10 % ng/mL) [6]. Catalona et al. suggested a cutoff of 24% to detect 90% of cancers and to avoid 18% of benign biopsy findings in patients with a PSA value 2.6-4.0 ng/mL [7]. In an update, Catalona et al. examined a variety of cutoffs, some of which were as low as 10%. Other investigators have recommended cutoffs of 18-27% [8]. Although the cutoff value of f/t PSA ratio is conflicting, in our previous study, 10% cutoff had a sensitivity of 37.6% and specificity of 95% in all age groups [9].

In addition, age-specific reference rates have been proposed as a means of improving specificity and positive predictive value of the total PSA in screening for prostate cancer. Previous studies demonstrated that the total PSA level is significantly related to age; however, an age-specific f/t PSA ratio has not yet been determinated. Chun et al. [10] and our previous study hypothesized that a relationship between f/tPSA ratio and age can be established [9]. Age-specific cutoffs were also reported by Catalona et al. as 20%, 26%, and 28% f/t PSA ratios for ages 50-59 years, 60-69 years, and 70-75 years, respectively [8].

In the our previous study, the f/t% PSA cutoff points were determined to be 10%, 15%, 15% and 10% in 50-59years, 60-69years, >70 years, and all ages categories in patients with initial PSA level of 4-10 ng/ml, respectively [9]. It was accepted that free %PSA was not efective in the PSA range of 10-20 ng/ml. But in a Chinese multicenter study the authors claimed that %f/t PSA over 23.4% may delayoravoidun necessary biopsy in patients with PSA 10-20 ng/ml, aged ≥60 years old. However they also emphasized the lower chance of PC a detection in Chinese compared with the Western population at the same PSA level [11].

Thus, the %f/t PSA is increasingly used and can reduce the number of unnecessary biopsies, but in the perspective of future,usage of %f/t PSA with new biochemical markers such as Prostate

Specific Membran Antigene (PSMA) may be increased the value of PSA and its derivates in the diagnosis of significant PCa. Patients with very low PSA values can referee to PSMA-ligand PET/CTimaging in alternative imaging modalities such as computed tomography (CT) or magnetic resonance imaging (MRI).

Inaddition, magnetic resonance imaging (MRI) which is a functional technique that gives physiologic information on anatomic structures and malignant lesions, is currently the best imaging method for PCa detection. However MRI does not rule out prostate biopsy alone and it does not providelosing PSA significance.

The choice of the best cutoff for the f/t PSA ratio depends on a variety of arguments that mainly include the combination of screening modalities used. The age related changes warrant further investigations in a larger, multicentric and multinational population to improve the clinical use of f/t PSA cutoffs.

References

1. Thompson IM, Pauler DK, Goodman PJ, Tangen CM, Lucia MS, Parnes HL, et al. Prevalence of prostate cancer among men with a prostate-specific antigen level < or =4.0 ng per milliliter. N Engl J Med. 2004; 350: 2239-2246.
2. Loeb S, Roehl KA, Antenor JA, Catalona WJ, Suarez BK, Nadler RB. Baseline prostate-specific antigen compared with median prostate-specific antigen for age group as predictor of prostate cancer risk in men younger than 60 years old. Urology. 2006; 67: 316-320.
3. Kundu SD, Roehl KA, Antenor JAV, Catalona WJ, Nadler RB. Age-specific risk of prostate cancer if PSA is between the median value and commonly used biopsy thresholds. J Urol. 2005; 173: 258.
4. Murray NP, Reyes E, Orellana N, Fuentealba C, Dueñas R. A comparative performance analysis of total PSA, percentage free PSA, PSA velocity, and PSA density versus the detection of primary circulating prostate cells in predicting initial prostate biopsy findings in Chilean men. Biomed Res Int. 2014; 2014: 676572.
5. Kitagawa Y, Ueno S, Izumi K, Kadono Y, Konaka H, Mizokami A, et al. Cumulative probability of prostate cancer detection in biopsy according to free/total PSA ratio in men with total PSA levels of 2.1-10.0 ng/ml at population screening. J Cancer Res Clin Oncol. 2014; 140: 53-59.
6. Partin AW, Mangold LA, Lamm DM, Walsh PC, Epstein JI, Pearson JD. Contemporary update of prostate cancer staging nomograms (Partin Tables) for the new millennium. Urology. 2001; 58: 843-848.
7. Catalona WJ, Smith DS, Wolfert RL, Wang TJ, Rittenhouse HG, Ratliff TL, et al. Evaluation of percentage of free serum prostate-specific antigen to improve specificity of prostate cancer screening. JAMA. 1995; 274: 1214-1220.
8. Catalona WJ, Partin AW, Slawin KM, Brawer MK, Flanigan RC, Patel A, et al. Use of percentage of free prostate specificantigen to enhance differentiation of prostate cancer frombenign prostatic disease: a prospective multicenter trial. J Am Med Assoc 1998; 279: 1542-1547.
9. Erol B, Gulpinar MT, Bozdogan G, Ozkanli S, Onem K, Mungan G, et al. The cutoff level of free/total prostate specific antigen (f/t PSA) ratios in the diagnosis of prostate cancer: a validation study on a Turkish patient population in different age categories. Kaohsiung J Med Sci. 2014; 30: 545-550.
10. Chun FK, Perrotte P, Briganti A, Benayoun S, Lebeau T, Ramirez A, et al. Prostate specific-antigen distribution in asymptomatic Canadian men with no clinical evidence of prostate cancer. BJU Int. 2006; 98: 50-53.
11. Chen R, Zhou LQ, Cai XB, Xie LP, Huang YR, He DL, et al. Percent free prostate-specific antigen is effective to predict prostate biopsy outcome in Chinese men with prostate-specific antigen between 10.1 and 20.0 ng ml-1. Asian J Androl. 2015.

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