

# Prostate Health Index in Daily Clinical Practice

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## | Introduction

Prostate specific antigen (PSA) sensitivity and specificity for the prostate cancer (PC) detection reaches 78–100% and only 6–66%, respectively [1]. Calculation of PHI using the values of the isoform [-2]proPSA, fPSA and PSA has led to a reduction in the number of biopsies in men  $\geq 50$  years old with PSA 2–10 ng/ml and negative digital rectal exam (DRE) [2]. Based on our previous results we have set up a PHI cut-off  $\geq 40$  for the indication of the next biopsy [3].

## | Aim

To assess an impact of Prostate health index (PHI) measurement on clinician's decision in patients with elevated prostate specific antigen (PSA).

## | Materials and methods

Between 05/2015 and 05/2016 we performed a total of 232 PHI measurements. Study group is described in Table 1. Indications for PHI measurement were either previous negative prostate biopsy (PB) or PB with atypical small acinar proliferation (ASAP), or persistent elevation of PSA before primary or repeated PB. Clinical and biochemical parameters were assessed in patients with positive PB, that was indicated based on PHI measurement. Control group was a group of patients with negative PB after PHI measurement. The distribution of parameters in different groups and subgroups was assessed by nonparametric tests and their correlation by Spearman's correlation coefficient.

## | Results

Mean age was 65 years (37 - 91). Mean PSA level before indication of PHI was 7.95 ng/ml and then used in PHI calculation was 7.62 ng/ml which was in highly positive correlation. Information about follow up after PHI measurement was available in 196 (84.5 %) patients until 05/2016. Repeated measurement of PSA only was indicated in 115 (58.7 %) cases. Prostate biopsy was indicated in 69 (35.2 %) men and was performed in 48 men until the end of 05/2016. Cancer was found in 21 (43.8 %) patients. Levels of laboratory parameters were in correlation with age of patients, but only the PHI level did not correlate with the size of prostate ( $p=0.4917$ ). The level of PHI was significantly higher in patients who were indicated to next PB (mean 71.3 vs. 29.6;  $p=0.001$ ), the highest PHI level was in patients indicated to saturation PB (mean 74.1). None of laboratory parameters including PHI was significant for prediction of PB result. PHI to prostate size ratio in patients with PCa was significantly higher (2.1 vs. 1.3;  $p=0.039$ ) (Fig. 1) than the PSA to prostate size ratio measured before or within PHI measurement.

## | Conclusion

Use of PHI helped reduce absolute number of PB (65% reduction) in patients who were referred to PB (based on PSA level or previous PB results). Unlike PSA level, PHI level does not correlate with prostate size.

## | References

- 1 Harvey P, Basuita A, Endersby D, Curtis B, Iacovidou A, Walker M, et al: A systematic review of the diagnostic accuracy of prostate specific antigen. BMC Urol 2009;9:14.
- 2 Catalona WJ, Partin AW, Sanda MG, et al: A multicenter study of [-2]pro-prostate specific antigen combined with prostate specific antigen and free prostate specific antigen for prostate cancer detection in the 2.0 to 10.0 ng/ml prostate specific antigen range. J Urol 2011;185:1650–1655.
- 3 Čapoun O., Sobotka R, Soukup V, Zima T, Kalousová M, Hanuš T. Prostate health index (phi) in primary diagnosis of prostate cancer. Eur Urol Suppl 2014; 13(6) e1222

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Tab. 1 – study group characteristics

PHI measurements	n = 232
Mean age; years (range)	65 (37 – 91)
Mean PSA before PHI; ng/ml	7.9 (1.2 – 60.1)
Mean PHI result	44.4 (10.9 – 228.0)
Mean prostate size; g	46 (10 – 160)
Mean free/total PSA ratio; %	18.4 (5.3 – 42.2)
Previous negative Bx	168 (72.4%)
History of ASAP	25 (11%)
Suspect digital rectal exam	23 (10.5%)

Tab. 2 – Next procedure after PHI measurement (until 05/2016)

Clinician's decision available	n = 196
PSA control repeated	115 (58.8%)
Saturation biopsy indication	32 (16.2%)
Standard biopsy indication	37 (18.9%)
MRI	8 (4.1%)
Other	4 (2.0%)
<b>Cancer found</b>	<b>21 /69 (30.4%)</b>

Fig. 1 – PHI density in relation to prostate biopsy result

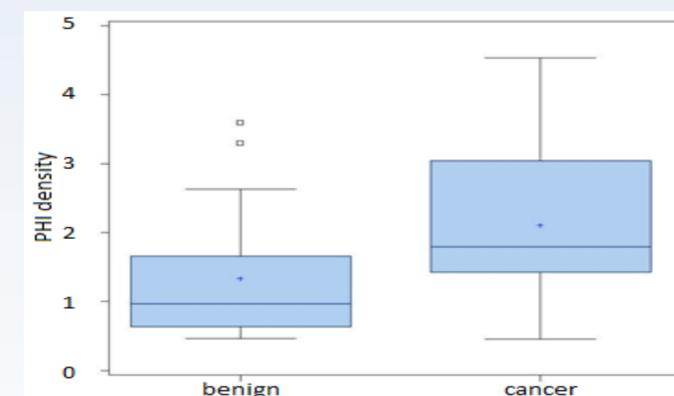


Fig. 2 – Gleason score distribution (n = 21)

