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Can Prostatype test system improve prognostic evaluation for metastasis and death in prostate cancer, a validation study

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Introduction & Objectives

The overdiagnosis and overtreatment of prostate cancer (PCa) with known risk for serious side effects are concerns when a treatment decision is made.

In recent years genetic biomarkers for various cancers have improved and are more commonly used in clinical work(1).

Prostatype test system® (PrTS) is an algorithm that is based on ISUP-grade, PSA, T-stage and gene expression of three genetical markers (IGFBP3, F3 and VGLL3) from prostate core needle biopsy (CNB) material(2). The prognosis is given in a P-score 0-2 (low, intermediate and high risk).

The study aim was to retrospectively validate PrTS capability to foresee the risk of metastasis and death in PCa with primary endpoint death in PCa and secondary endpoint radiologically verified metastasis.

Material & Methods

All 716 patients diagnosed with PCa using CNB 01.01.2008 to 31.12.2010 in Malmö and Lund, Sweden were included in the study.

Exclusion of 102 patients who had less than 2mm cancer in CNB and 5 patients who were lost to follow up. Data was collected retrospectively .

Genetical analysis was done on all CNB from diagnosis. P-score for each patient was set and compared to known risk scores such as D´Amico. Approval was obtained from the Swedish Ethical Committee.

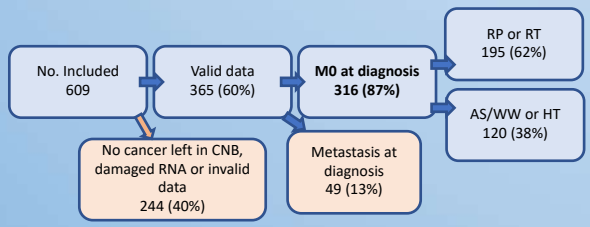

Fig 1. Flowchart included patients

Results

Of 609 patients, 316 had local disease at diagnosis (M0) and were included in the analysis (Fig 1). Median follow up was 8,5 years (1-11) and age at diagnosis 68 (46-93).

During follow up 47 patients developed secondary metastasis and 33 died from PCa. All patients that developed metastasis or died from PCa had a P-score 1-2 (Fig 2). PrTS had a significantly higher concordance index than the D´Amico (p<0,0001) in a ROC-analysis for metastasis and death from prostate cancer (Fig 3a, 3b). This was true for patients receiving curative treatment or hormonal treatment (Table 1). A comparison between P-score and D´Amico is given in Table 2.

Metastatic Free Survival **PCa Survival**

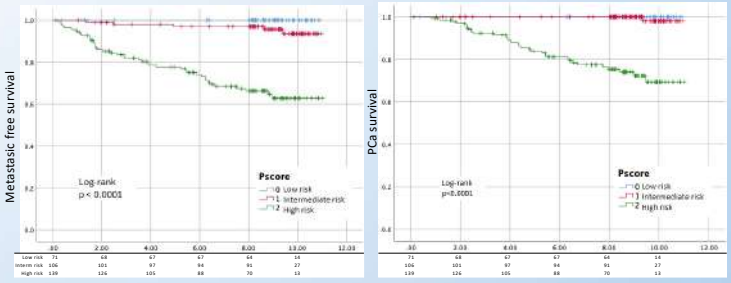

Fig 2. Kaplan-Meier curves for metastasis free survival and death from PCa

Secondary metastasis **PCa specific death**

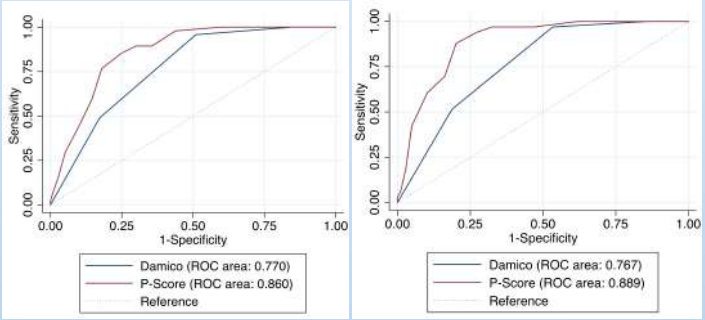

Fig 3a. ROC curve sec. metastasis

Fig 3b. ROC curve death from PCa

Endpoint	Treatment	AUC P-score	AUC D´Amico	Controls	Cases	P-score vs D´Amico
Death from PCa	RP or RT	0,88	0,73	189	7	20,2%
	AS/WW or HT	0,81	0,67	94	26	22,1%
Metastasis free survival	RP or RT	0,85	0,74	179	17	13,8%
	AS/WW or HT	0,82	0,69	89	31	18,8%

Table 1. C-index for P-Score and D´Amico. *Area under the curve (AUC).*

Prostatype changes risk classification

D´Amico	to P-score	Patients N (%)	Death in PCa	Sec. metastasis
Low	Low	30 (73)	0	0
	Interm	11 (27)	0	0
	High	0 (0)	0	0
Interm	Low	**28 (30)**	**0**	**0**
	Interm	54 (59)	1	2
	High	**10 (11)**	0	0
High	Low	**13 (7)**	**0**	**0**
	Interm	41 (22)	0	3
	High	129 (70)	32	42

Table 2. Shifts in risk classification between D´Amico and P-Score

Conclusion

In our study PrTS gave improved prognostic evaluation for metastasis and death in prostate cancer compared to other known risk indicators. Prostatype can be a beneficial marker when treatment decision is made.

References:

[1] Matulay, Justin T., and Sven Wenske. 2018. "Genetic Signatures on Prostate Biopsy: Clinical Implications." *Translational Cancer Research* 7 (S6): S640–50.

[2] Peng, Z., L. Skoog, H. Hellborg, G. Jonstam, I-L Wingmo, M. Hjälm-Eriksson, U. Harmenberg, et al. 2014. "An Expression Signature at Diagnosis to Estimate Prostate Cancer Patients' Overall Survival." *Prostate Cancer and Prostatic Diseases* 17 (1): 81–90.