Prostatype® Test System provides information on overall survival and treatment options for patients with newly diagnosed prostate cancer

Avoiding Over/Under Treatments

Patients with newly diagnosed prostate cancer can have very different clinical outcomes and require personalized treatments. Patients with indolent disease do not urgently need radical treatment and patients with other medical conditions may not benefit from radical treatment for their prostate cancer[1]. While some patients with aggressive disease might be under-treated due to the fact that 20-30% of biopsies are pathologically under-graded or missing the high grade cancer area [2,3]. A more accurate overall survival prediction for each patient at the time of prostate cancer diagnosis is crucial for optimizing treatment effect, avoiding unnecessary complications, minimizing anxiety and improving quality of life. A better clinical tool is needed to improve the accuracy of predicting clinical outcomes at an individual level and supporting treatment decisions.

Based on the cancer stem cell concept, the unique Swedish Cancer Registry and the results of prostate cancer whole genome analysis, Chundsell Medicals AB has during the past decade been devoted to developing a simple, and robust prognostic tool - the Prostatype® Test System. The system does not require additional sample taking from the patients and can provide a prognostic guideline supporting treatment decision within 1-2 working days. The Prostatype® Test System has been validated in different cohorts in the Scandinavian area, is CE-marked and registered at the Swedish Medical Product Agency.

Clinical and Scientific Evidences

A previously reported 3-gene signature (VGLL3, IGFBP3 and F3) was validated regarding its potential to improve survival time prediction at diagnosis when combined with clinical parameters such as age at diagnosis, Gleason score, tumor stage and PSA in formalin fixed paraffin-embedded prostate needle biopsy materials [4-6]. The Prostatype® Test System contains two components. The first component is the Prostatype® RT-qPCR Kit, which measures the gene expression levels of IGFBP3, F3 and VGLL3 in FFPE prostate core needle biopsy samples. The second component is a cohort-based algorithm, the Classification of Prostatic Malignancy Algorithm (CPMA). The database is composed of patients selected from a population-based cohort (Stockholm area, Sweden) diagnosed between 2004 and 2008 with 7 to 11 years of clinical follow-up data.

Prediction accuracy of overall, cancer-specific and non-cancer-specific survival based on CPMA parameters, D'Amico and the CAPRA risk groups, was evaluated [7,8]. Both a Weibull regression model and the CPMA algorithm were used. In Weibull regression analyses, 452 historical patients were analyzed. Receiver operating curve (ROC) analyses show that the Area under the curve (AUC) for overall survival prediction is significantly increased, from 0.72 for D'Amico risk groups and 0.72 for CAPRA risk groups (0-2, 3-5

and 6-10) to 0.81 for CPMA parameters (Figure 1). For 187 patients with Gleason score 7, the improvement of prediction accuracy for overall survival is even more significant, with AUC 0.59 for D'Amico risk groups and 0.62 for CAPRA risk groups (0-2, 3-5 and 6-10) compared to 0.75 for CPMA parameters (Figure 2).

In CPMA algorithm analyses, for 234 individuals who were not treated with prostatectomy/radiation, we performed analysis of survival prediction accuracy using CAPRA risk groups, D'Amico risk groups or CPMA parameters. For the D'Amico risk groups, the overall survival prediction accuracy is 89% for the low-risk group, 54% for the intermediate-risk group, 65% for the high-risk group, and 72% for the locally advanced group. When using the CPMA parameters, the overall accuracy is increased to 89%, 77% 76% and 85%, respectively (Table 1). The overall survival prediction accuracy is 88% for CAPRA 0-2 group, 56% for CAPRA 3-5 and 66% for CAPRA 6-10. Similarly, overall accuracy is increased to 88%, 76% and 83% for the respective groups, when using the CPMA parameters (Table 1).

The CPMA parameters and its clinically implemented database algorithm (CPMA) which is part of the Prostatype® Test System, increase overall survival prediction accuracy compared to the currently used prognostic tools. It is therefore justified to consider the use of CPMA in clinical practice.

Table 1. Overall survival prediction accuracy.

	Low-risk	Intermediate-risk	High-risk	Locally advanced
D'Amico	89%	54%	65%	72%
CPMA	89%	77%	76%	85%
	CAPRA 0-2	CAPRA3-5	CAPRA 6-10	
CAPRA	88%	56%	66%	
CPMA	88%	76%	83%	

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Figure 1. Receiver Operating Characteristic (ROC) curves for overall survival prediction.

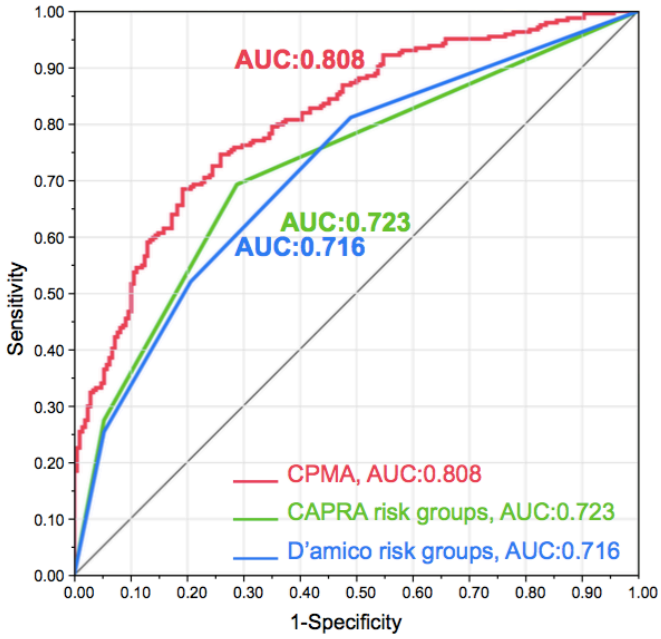

Figure 2. Receiver Operating Characteristic (ROC) curves of overall survival prediction for patients with Gleason Score=7.