Diagnosis of Prostate Cancer Based on Plasmatic Determination of Matrix Metalloproteinase 9

Introduction and Objective: Matrix metalloproteinase 9 (MMP-9) is a proteolytic enzyme which degrades basal membranes. Although tissue expression of MMP-9 has shown a strong relation with diagnosis and prognostic factors of prostate cancer, plasma expression is poorly studied and results are controversial, probably because of the metodological problems and small samples. The objective of this study is to analyze the value of plasmatic determination of MMP-9 in the diagnosis of prostate cancer.
Materials and Methods: Prospective hospital-based cohort of 282 consecutive patients who were to be subjected to prostate biopsy. Blood sampling in glass tubes with EDTA K3E was done previous to the biopsy. The plasma determination of MMP-9 was carried out by means of immunoassay, and PSA determination by chemiluminescence.
Results: There were 118 prostate cancers diagnosed. The statistic relationship between total PSA, PSA isoforms and diagnostic parametres of prostate cancer was always the same as observed in previous literature. Mean value of plasmatic MMP-9 was 487.89 (0-2001.1) ng/ml, with a mean 498.88 (0-2001.1) ng/ml in prostate cancer patients and 476.67 (0-1849.8) ng/ml in healthy patients. Statistical differences were not observed between the two groups (p=1.000). The analysis as a function of PSA did not show differences in plasmatic MMP-9 expression between prostate cancer patients and healthy patients in the subgroup of PSA < 4 ng/ml (p=0.5882), in the subgroup of PSA 4-10 ng/ml (p=0.4841) or in the subgroup of PSA > 10 ng/ml (p=0.3923). The logistic regression analysis did not find a relation between PSA expression and plamatic MMP-9 expression (p=0.0286). To investigate the role of MMP-9 in the hematoprostatic barrier breakage a test of logistic regression was done to establish a connection between the plasmatic expression of MMP-9 and the percent-free PSA, proving statistical independence (p=0.1869). No relation was found between the MMP-9 expression and tumour presence in the subgroup of patients with percent-free PSA ≤ 15% (p=0.8774), neither in the subgroup of patients with percent-free PSA > 15% (p=0.7773).
Conclusion: In the largest study performed up to now, the plasma expression of Matrix Metalloproteinase 9 has not shown any value as prostate cancer diagnostic marker.