-Bachelor's Degree Final Project-

DEGREE OF BIOCHEMISTRY AND MOLECULAR BIOLOGY

STUDY OF FN14 EXPRESSION IN SEMEN CELLULAR RESIDUE OF PROSTATE CANCER PATIENTS

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This project is confidential.

Work is based on the results obtained over my curricular practices carried out in the Disease Biomarker and Molecular Mechanism (DIBIOMEC) group under the mentorship of Dr. Matilde Rodríguez Chacón.

Abstract

Introduction: There is a clinical need of new biomarkers for screening/diagnosis prostate cancer (PCa) that can provide an indication of disease aggressiveness and provide a precision medicine approach to PCa management. We evaluate the ability to differentiate aggressive from indolent PCa using the gene mRNA expression of an inflammation receptor obtained from the semen cell sediment of PCa patients.

Materials and methods: Semen samples were collected from 48 patients undergoing radical prostatectomy and 19 healthy control patients. RNA was extracted and the expression of KLK2, KLK3, FOLH1, TGM4 (prostate specific gene) and inflammation-related receptor gene was quantified by real-time PCR in semen cell sediment. In addition, clinical and anthropometric variables were studied. Binary logistic regression, odd ratio and receiver operating characteristic analyses were used to evaluate the predictive ability of studied receptor gene in a biomarker panel for the assessment of PCa aggressiveness.

Results: Serum levels of prostate-specific antigen (PSA) and inflammation-related receptor gene mRNA levels in seminal cell sediment were significantly higher in PCa patients (International Society of Urological Pathology (ISUP) Group II-V) than in control patients (control subjects and ISUP Group I). ROC curve and logistic regression analysis showed that the biomarker panel composed of PSA and inflammation-related receptor gene/TGM4 allowed distinguishing the aggressiveness of PCa in 81% of patients. The diagnostic power of PCa was 7.4% higher than that of the classical clinical biomarker PSA. Analysis of the area under the curve (AUC) revealed that this combination was more accurate [AUC = 0.913 95% confidence interval (CI): 0.842-0.985] than total serum PSA (AUC = 0.887 95% CI: 0.807-0.967), due to an 8.3% increase in specificity.

Conclusions: The non-invasive biomarker panel composed of serum PSA levels and inflammation-related receptor gene/TGM4 mRNA levels in seminal cell sediment could be used to classify the aggressiveness of PCa as it improves the specificity and predictive power of the classical PSA marker.