Editorial Comment

Editorial Comment to Potential tumor markers of renal cell carcinoma: α-Enolase for postoperative follow up, and galectin-1 and galectin-3 for primary detection

The search for markers that can characterize renal tumors according to their histological type, aggressiveness and progression has been the subject of many studies over the years. Techniques such as cytogenetics and genomic microarrays have been widely used for this characterization, but currently, proteomic techniques have also been used in the pursuit of these markers, mainly due to the progress of this technology, the development of quantitative methods, high resolution, high speed and sensitivity of mass spectrometers, which opened new avenues for biomarker discovery. The technology can be applied in proteomic analysis of protein expression, which is caused by a change in gene transcription, such as alternative splicing and post-translational modifications that occur without alteration in gene expression. Thus, using different strategies for proteomic analysis, several different proteins expressed in RCC were identified. These proteins are candidates for biomarkers belong to different families, such as the annexins, vimentin, metabolic enzymes, proteins of signal transduction pathways, growth factors, differentiation markers, tumor suppressor genes, cytoskeletal components, and stress proteins, as well as proteins involved in resistance to chemotherapy. Despite these studies, existing information on renal cell carcinoma (RCC) is limited to a small number of differentially expressed proteins, which often need to be further validated by techniques such as reverse transcription polymerase chain reaction and/or immunohistochemistry using a large number of samples of RCC. Therefore, the identification and validation of biomarkers that can be used for diagnosis, prognosis and monitoring of treatment of this disease are still urgently required.

The authors of this study examined plasma levels of eight proteins in 15 RCC patients before and after surgery, and in 51 healthy controls using enzyme-linked immunoassay. Plasma levels of α-enolase, calnexin, galectin-1, galectin-3 and lectin mannose-binding 2 were significantly higher in RCC patients than in healthy controls (P < 0.05). A combinatorial use of galectin-1 and galectin-3 showed 98% specificity and 47% sensitivity. In addition, the assays indicated that plasma α-enolase levels in patients decreased significantly 4 weeks after nephrectomy (P = 0.0034), and this tendency continued until 12 weeks after nephrectomy (P = 0.0156). They proposed that α-enolase could have applications in the follow-up care of postoperative RCC patients, whereas the combined use of galectin-1 and galectin-3 might be useful for primary detection.

This study was limited by the small number of patients with RCC. For this reason, the authors did not analyze prognostic factors associated with survival of patients with renal cancer, such as the presence of tumor necrosis and lymph node involvement. Four patients had diagnosed metastases; however, it is not clear why α-enolase decreased after surgery in these cases. Was it because the amount of remaining tumor was small? In this case, would the dosage of α-enolase be useful for diagnosing recurrences or metastases after surgery? However, the results are promising, and perhaps studying a larger number of patients will show the utility of these markers for diagnosis and monitoring the development of these tumors.

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Conflict of interest
None declared.

References


