

RENAL CELL CARCINOMA IN THE CONTEXT OF LIQUID BIOPSIES: A LITERATURE REVIEW

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Introduction

Totalizing 2 to 3% of the malignant neoplasias in adults, renal cell carcinoma (RCC) is the most lethal common urological cancer. Globally, about 12 new cases of RCC per 100,000 inhabitants are diagnosed every year (1). A liquid biopsy is an emerging test that measures patient biomarkers, including circulating tumor cells, cell-free DNA, cell-free RNA, tumor-derived metabolites and proteins. This non-invasive procedure provides real-time patient information for diagnosis, prognostic assessment, treatment monitoring, and response evaluation through the detection of biomarkers in biofluids, such as blood and urine (2,3). This study aims to evaluate the effectiveness of liquid biopsies in detecting RCC.

Methods

The present literature review was conducted through the search of scientific papers in the English language published between 2017 and 2023 in PubMed and ScienceDirect. For such, the following descriptors were utilized: "Carcinoma, Renal Cell" AND "Liquid Biopsy".

Results

In total, four papers were selected. It is evident that through liquid biopsies, plasma and urine-provenient proteomes not only are capable of reflecting functional changes in an early-stage clear cell RCC (ccRCC) at tissue level but also adaptations in the immune response. In addition, the analysis of plasma and urine proteomes distinguishes RCC from controls with a specificity of 92.6%/92.6% and sensibility of 96.3%/92.6%, respectively (4). One study correlates plasma and urine proteins with a venous infiltrating RCC. Out of the 156 proteins found in plasma samples, 58 were differentially expressed proteins (DEPs); and out of the 1207 proteins found in urine samples, 574 were DEPs. Regarding these, 26 were directly proportional to renal vein infiltration (5). Further research conducted with liquid biopsies shows that the levels of urinary cell-free RNA (cfRNA) were significantly higher in patients with ccRCC and significantly decreased in patients a week after surgical removal of the tumor. Also, the cfRNA discriminated the patients with ccRCC from the controls with a 57.8% sensitivity and an 80% specificity (6). Some of the selected studies' limitations included too small heterogeneous cohorts and a lack of internal validation (3).

Conclusion

Finally, liquid biopsies are non-invasive, low cost and highly effective procedures in the detection of RCC. It is imperative that new clinical trials implement larger prospective cohorts for further validation.

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