THE POTENTIAL BENEFITS OF URINARY AND BLOOD LIQUID BIOPSIES FOR PREDICTING EARLY DIAGNOSIS, THERAPY RESPONSE, AND PROGNOSIS IN RENAL CELL CARCINOMA PATIENTS: A SYSTEMATIC REVIEW

Boby Pratama Putra[1], Felix Nugraha Putra[2]
[1]Medical Doctor, Blitar, Indonesia, [2]Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

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BACKGROUND

The lack of reliable biomarker and tissue biopsy limitations in renal cell carcinoma (RCC) patients for early detection, therapy response monitoring, and prognosis are still important issues. Previous studies suggest that liquid biopsy from urine and blood may provide abundant cancer-derived materials, such as proteomics, circulating tumour cells (CTCs), cell-free DNA (cfDNA), and circulating tumour DNA (ctDNA). Therefore, this study aims to evaluate urinary and blood liquid biopsies for predicting diagnosis, therapy response, and prognosis in RCC patients.

METHODS

- Comprehensive searching through Pubmed, EMBASE, ScienceDirect, and The Cochrane Library was performed to include all relevant literature from 2000 until 2021.
- This study was conducted according to the PRISMA guideline.
- All clinical blood and urinary liquid biopsies in RCC patients studies were included.
- The studies' quality was accessed by using the Newcastle-Ottawa Scale.

MOLECULAR ANALYSIS FOR PRECISION ONCOLOGY VIRTUAL CONGRESS — MAP

RESULTS

Fourteen studies met the inclusion criteria. A 26 proteins panel in metastatic RCC (mRCC) patients' urine is strongly correlated with the renal vein invasion. The urinary miR-210 expression is higher in RCC patients and significantly decreased in the disease-free group. The plasma cfDNA genes mutation (VHL, BAP1, PBRM1, PTEN) are not significantly correlated with metastasis burden, while the pre-treatment plasma ctDNA is significantly associated with shorter progression-free survival (PFS) and overall survival (OS) on RCC first-line therapy. The CHIP-related genes mutation (CNMT3A, TET2, ASXL1) in mRCC has shorter PFS and OS. The SHOX2 gene cfDNA methylation is strongly correlated with advanced stage, vascular invasion, and mortality risk. N-cadherin and CD133-positive CTCs are associated with inferior PFS and have inverse correlation with HIF1A, VEGFA, VEGFR, and FGFR expressions. Expression of both PD-L1 and HLA-I on RCC CTCs has higher treatment response.

CONCLUSIONS

The urinary and blood liquid biopsies suggest potential benefits for predicting early diagnosis, therapy response monitoring, and prognosis in RCC patients. However, further clinical studies are warranted to validate the benefits.

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