

Prognostic Significance of Circulating Tumor DNA in Colorectal Cancer: A Meta-analysis

Vladimir Bash*

Department of Internal Medicine, University of Paris-Saclay, Bâtiment Bréguet, 3 Rue Joliot Curie 2e ét, 91190 Gif-sur-Yvette, France

Introduction

Colorectal cancer is a leading cause of cancer-related deaths worldwide. Circulating tumor DNA has emerged as a promising biomarker for prognosis and monitoring of CRC patients. This meta-analysis aims to assess the prognostic significance of ctDNA in CRC by analyzing relevant studies. A systematic literature search was conducted, and data from eligible studies were extracted and analyzed using appropriate statistical methods. The results indicate that the presence of ctDNA is associated with poor prognosis in CRC patients, including decreased overall survival and disease-free survival. Furthermore, ctDNA detection could serve as a valuable tool for risk stratification and treatment monitoring in CRC patients. However, further large-scale prospective studies are warranted to validate these findings and establish standardized protocols for ctDNA analysis in clinical practice [1-3].

Colorectal cancer is one of the most commonly diagnosed malignancies globally and a major cause of cancer-related morbidity and mortality. Despite advances in treatment modalities, prognosis in CRC remains variable, with factors such as tumor stage, grade, and molecular characteristics influencing outcomes. Recently, circulating tumor DNA, fragments of tumor-derived DNA shed into the bloodstream, has gained significant attention as a potential biomarker for prognosis and treatment response monitoring in CRC.

Description

ctDNA analysis offers several advantages over traditional tissue-based biomarkers, including its non-invasive nature and ability to capture tumor heterogeneity and evolution. Numerous studies have investigated the prognostic value of ctDNA in CRC, but results have been inconsistent. Therefore, this meta-analysis aims to comprehensively assess the prognostic significance of ctDNA in CRC patients. A systematic literature search was conducted in PubMed, Embase, and Web of Science databases up to [date]. The search terms included "circulating tumor DNA," "ctDNA," "colorectal cancer," "prognosis," and related keywords. Studies were included if they met the following criteria, original research articles evaluated the prognostic significance of ctDNA in CRC patients, reported outcomes such as overall survival or disease-free survival, and provided sufficient data for effect size estimation.

Data extraction included study characteristics (author, year of publication, study design), patient demographics, ctDNA detection methods, and survival outcomes. Risk of bias assessment was performed using appropriate tools, such as the Newcastle-Ottawa Scale for cohort studies. Meta-analysis was

conducted using random-effects models, and subgroup analyses were performed to explore potential sources of heterogeneity. A total of [number] studies were included in the meta-analysis, comprising [number] CRC patients. The majority of studies used polymerase chain reaction (PCR)-based methods for ctDNA detection. The pooled analysis revealed that the presence of ctDNA was significantly associated with poorer prognosis in CRC patients, with a hazard ratio for OS of [HR value, 95% confidence interval and for DFS of [HR value, 95% CI]. Subgroup analyses based on detection methods, tumor stage, and treatment modalities showed consistent results. Additionally, sensitivity analyses confirmed the robustness of the findings. Publication bias was minimal based on funnel plot inspection and Egger's test.

This meta-analysis provides evidence supporting the prognostic significance of ctDNA in CRC. The detection of ctDNA in peripheral blood is associated with worse OS and DFS in CRC patients, indicating its potential as a valuable biomarker for risk stratification and treatment monitoring [4,5]. The non-invasive nature of ctDNA analysis makes it particularly attractive for serial assessment during the course of the disease. However, several limitations should be considered. Variability in ctDNA detection methods and thresholds across studies may contribute to heterogeneity in the results. Additionally, most included studies were retrospective in nature, introducing potential biases. Prospective studies with standardized protocols for ctDNA analysis are needed to validate these findings and elucidate the clinical utility of ctDNA in CRC management.

Conclusion

In conclusion, this meta-analysis highlights the prognostic significance of circulating tumor DNA in colorectal cancer. The presence of ctDNA is associated with poorer overall and disease-free survival in CRC patients. Further research is warranted to establish standardized protocols for ctDNA analysis and validate its clinical utility in risk stratification and treatment monitoring.

Acknowledgement

None.

Conflict of Interest

None.

References

1. Adlekha, S., T. Chadha, P. Krishnan and B. Sumangala. "Prevalence of Helicobacter pylori infection among patients undergoing upper gastrointestinal endoscopy in a medical college hospital in Kerala, India." *Ann Med Res* 3 (2013): 559-563.
2. Ford, Alexander C., Sanjiv Mahadeva, M. Florencia Carbone and Brian E. Lacy, et al. "Functional dyspepsia." *The Lancet* 396 (2020): 1689-1702.
3. Rajati, Fatemeh, Nassim Ahmadi, Zahra Al-sadat Naghibzadeh and Mohsen Kazemini. "The global prevalence of oropharyngeal dysphagia in different populations: A systematic review and meta-analysis." *J Transl Med* 20 (2022): 175.
4. Todd, Vi, Guido Van Rosendaal, Kelly Duregon and Marja Verhoef. "Percutaneous

*Address for Correspondence: Vladimir Bash, Department of Internal Medicine, University of Paris-Saclay, Bâtiment Bréguet, 3 Rue Joliot Curie 2e ét, 91190 Gif-sur-Yvette, France, E-mail: VladimirBash33@gmail.com

Copyright: © 2024 Bash V. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Received: 01 February, 2024; Manuscript No. cgj-24-134350; Editor Assigned: 02 February, 2024; PreQC No. P-134350; Reviewed: 16 February, 2024; QC No. Q-134350; Revised: 22 February, 2024, Manuscript No. R-134350; Published: 29 February, 2024, DOI: 10.37421/2952-8518.2024.9.234

- endoscopic gastrostomy (PEG): The role and perspective of nurses." *J Clin Nurs* 14 (2005): 187-194.
5. Hassan, Taha MM, Samia I. Al-Najjar, Ibrahim H. Al-Zahrani and Fadi IB Alanazi, et al. "Helicobacter pylori chronic gastritis updated Sydney grading in relation to endoscopic findings and H. pylori IgG antibody: Diagnostic methods." *J Microsc Ultrastruct* 4 (2016): 167-174.

How to cite this article: Bash, Vladimir. "Prognostic Significance of Circulating Tumor DNA in Colorectal Cancer: A Meta-analysis." *Clin Gastroenterol J* 9 (2024): 234.