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Evaluation of the diagnostic and prognostic clinical values of circulating tumor DNA (ctDNA) and cell-free DNA (cfDNA) in pancreatic malignancies: A comprehensive meta-analysis

Arayici, ME¹; Inal, A²; Basbinar, Y³; Olgun, N⁴.**ADMINISTRATIVE INFORMATION****Support** - None.**Review Stage at time of this submission** - Completed but not published.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY2023120092**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 23 December 2023 and was last updated on 23 December 2023.**INTRODUCTION**

Review question / Objective The purpose of this paper was to comprehensively assess and elucidate the clinical value of ctDNA and cfDNA in the context of pancreatic malignancies, carrying out a meta-analysis of their potential as biomarkers for early detection and prognostication evaluation.

Condition being studied The diagnostic and prognostic clinical value of ctDNA and cfDNA.

METHODS

Search strategy PubMed/Medline, Scopus, and Web of Science (WoS) databases.

Participant or population Participants with pancreatic malignancies.

Intervention ctDNA and cfDNA.

Comparator CA 19.9.

Study designs to be included Clinical and observational studies.

Eligibility criteria Patients with pancreatic malignancies; diagnostic, prognostic or predictive values of ctDNA and cfDNA.

Information sources Pubmed/Medline, Scopus, Web of Science.

Main outcome(s) Diagnostic accuracy of ctDNA or cfDNA; Prognostic role of ctDNA on overall survival.

Quality assessment / Risk of bias analysis REMARK criteria.

Strategy of data synthesis In the given context, risk ratios (RRs) were calculated to determine the diagnostic accuracy of circulating tumor DNA (ctDNA) or cell-free DNA (cfDNA) compared to the

cancer antigen 19.9 (CA 19.9) across all stages of the disease. Additionally, hazard ratios (HRs) were used to assess the impact of ctDNA on overall survival, presumably as a prognostic indicator. These ratios provide a quantitative measure of the relative risk and potential predictive value of these biomarkers.

Furthermore, to gauge the variability or heterogeneity in the outcomes of the included studies, statistical methods such as Cochran's Q test and the I^2 statistic were employed. Cochran's Q is a measure of heterogeneity, providing a p-value to test the null hypothesis that all studies are evaluating the same effect. In contrast, the I^2 statistic quantifies the proportion of total variation across studies due to heterogeneity rather than chance. High I^2 values indicate a higher degree of variability between the studies that might not be attributable to random chance alone.

Subgroup analysis None.

Sensitivity analysis Sensitivity analyses were conducted to determine the stability and reliability of the overall results by re-evaluating the effect size with the sequential removal of each study.

Language restriction Only studies in English were included.

Country(ies) involved Turkey.

Keywords ctDNA; cfDNA; pancreatic malignancy; meta-analysis.

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