Clinical usefulness of serum CA50 in pancreatic cancer diagnosis: meta-analysis and systematic review of literature

Zhu, L1.

Review question / Objective: Our objective was to obtain summary estimates of the accuracy of carbohydrate antigen 50 for diagnosing pancreatic cancer using randomized controlled trials.

Condition being studied: Pancreatic cancer.


INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 22 April 2022 and was last updated on 22 April 2022 (registration number INPLASY202240138).

INTRODUCTION

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METHODS

Participant or population: Pancreatic cancer patients.

Intervention: The test of carbohydrate antigen 50 in pancreas of pancreatic cancer.

Comparator: The test of carbohydrate antigen 50 in pancreas of non-pancreatic cancer.

Study designs to be included: RCT.

Eligibility criteria: Pathological investigation.
**Information sources:** PubMed, EMBASE, Cochrane Library, Web of science.

**Main outcome(s):** Sensitivity (SEN), specificity (SPE), positive likelihood ratio (PLR), negative likelihood ratio (NLR), diagnostic odds ratio (DOR) and area under the curve (AUC).

**Quality assessment / Risk of bias analysis:** The quality of all studies was assessed independently by two investigators with QUADAS-2 (Quality Assessment of Diagnostic Accuracy Studies 2). The included literature is scored by 14 criteria, and each item is scored with “yes” plus 1 point, “no” minus 1 point, and “unclear” as 0 points. Disagreements were resolved through discussion and, when necessary, by consultation with a third author. Cochrane tools.

**Strategy of data synthesis:** Inconsistency statistic ($I^2$) was calculated to evaluate level of heterogeneity by Stata (0%-30%: homogeneity; 30%-50%: moderate heterogeneity; 50%-80%: substantial heterogeneity; >80%: considerable heterogeneity). And if no or moderate heterogeneity ($I^2 < 50\%$ or $P > 0.05$), the fixed-effect model was applied; if not, the random-effects model. The diagnostic value of CA50 for PC was evaluated by calculating the following items: sensitivity, specificity, PLR, NLR, DOR, the corresponding 95% CI, summary receiver-operator characteristic (SROCs) curves and the pooled AUC values. Then the spearman correlation coefficient was calculated by metadisc1.40 software to evaluate the causes of heterogeneity: $P > 0.05$, which means no threshold effect, and all indicators can be combined; $P < 0.05$, which means threshold effect, and the indicators can not be combined, but briefly described. Subsequently, the sources of heterogeneity were analyzed by meta-regression and subgroup analysis. The robustness and reliability of the selected literatures were analyzed by sensitivity analysis. Finally, the Deek funnel plot was used to assess the publication bias, and $P < 0.05$ means statistically significant differences.

**Subgroup analysis:** Based on the results of meta regression analysis, factors that might cause heterogeneity: method, race, control, and sample were conducted subgroup analysis to determine the impact of CA50 on the diagnostic value of PC.

**Sensitivity analysis:** In order to examine the influence of individual studies on the stability of the results, after excluding the studies in turn, the combined effect size was re-estimated and compared with before.

**Country(ies) involved:** China.

**Keywords:** CA50; pancreatic cancer; biomarkers; diagnosis; meta analysis.

**Contributions of each author:**
Author 1 - Liangyu Zhu.
Email: zhuliangyu1216@163.com