Comparative Evaluation of CEA and CA 19 9 in Preoperative Pancreatic Ductal Adenocarcinoma

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Abstract:

Background: CA 19.9 is the most validated tumor marker used in clinical practice. However, it is less specific and sometime contributing to false negativity. Thus, CA 19-9 alone is not useful in diagnosis and monitoring PDAC. On other hand, CEA is overexpressed in many cancers such as colon, breast, lung and thyroid cancers. Moreover, its serum level get raised in 30-60% of patients with PDAC. However, due to low sensitivity and specificity, it is inferior to CA 19.9 in prediction of treatment response and prognostication of PDAC. But, in many studies, it is even suggested CEA as an independent predictor of poor survival rates in patients with PDAC.

Now, there is much less literature available that evaluate the prognostic impact of CEA compared to CA 19-9.(17-19) Thus, in this study, we have planned to find combined diagnostic and prognostic efficacy of CA19.9 and CEA in PDAC in order to know whether CA19.9 in combination with CEA aids imaging techniques in early detection of PDAC.

Methods: The study includes 35 clinically diagnosed and confirmed cases of PDAC. 35 age and sex matched healthy volunteers were selected and used for comparison of result. The analysis of CA19.9 and CEA was carried out on fully automated chemiluminescent immune analyzer. ROC analysis of CA-19 and CEA was the major statistical analysis to find cut-off, sensitivity, specificity and diagnostic efficacy of CEA and CA19.9 in PDAC. The results were used to know whether CEA in combination with CA19.9 helps in early detection of PDAC.

Results: We found CA 19.9 is more sensitive than CEA (Sensitivity 91.43 % vs 74.29 %). While CEA is more specific than CA 19.9 (Specificity 94.29 % vs 88.57 %) Now, comparing diagnostic efficacy of CA 19.9 (AUC = 0.971, accuracy = 90 %) and CEA (AUC = 0.907, accuracy = 92.29 %), it is found that both this markers have nearly equal diagnostic accuracy. However, CEA is less sensitive and CA 19-9 can

be elevated in acute cholangitis, pancreatitis, obstructive jaundice and liver cirrhosis contributing to false positivity. Additionally, Lewis-negative blood type patient do not produce CA 19-9 levels, thus contributing to false negativity. This adds limitations on alone use of CEA or CA 19.9 in PDAC. However, elevation in CA 19.9 with CEA level < 10 ng/ml may hint for resectable PDAC while elevation in CA 19.9 with CEA level > 10 ng/ml mostly hint for advanced PDAC. Thus, CA19.9 in combination with CEA increase diagnostic and prognostic efficacy and both in combination aids imaging techniques in early detection of PDAC.

Conclusions: Elevation in CA 19.9 with CEA level < 10 ng/ml may hint for resectable PDAC while elevation in CA 19.9 with CEA level > 10 ng/ml mostly hint for advanced PDAC. Thus, CA19.9 in combination with CEA increase diagnostic and prognostic efficacy and both in combination aids imaging techniques in early detection of PDAC.

Keywords:

Carcinoembryonic antigen, Carbohydrate Antigen 19–9, Pancreatic Ductal Adenocarcinoma.