




ASO Author Reflections: The Value of Serum CEA for Prognostication at Staging and Response Evaluation in Patients with Localized Pancreatic Adenocarcinoma and Nonelevated CA19-9

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PAST

Disease staging and response evaluation following chemotherapy for localized pancreatic adenocarcinoma is based on anatomical, biological, and conditional parameters.¹ Serum carbohydrate antigen 19-9 (CA19-9) is the only tumor marker recommended by guidelines for the purpose of biological (re)staging.² However, approximately one-third of

the patients have nonelevated serum CA19-9 at diagnosis,³ which hampers adequate response evaluation and clinical decision-making. Serum carcinoembryonic antigen (CEA) has been proposed as alternative biological tumor marker, but evidence about its prognostic value at time of diagnosis and restaging after chemotherapy as initial treatment is limited.²

PRESENT

The current, retrospective, multicenter study investigated the association of serum CEA with overall survival (OS) among 277 patients with localized pancreatic adenocarcinoma who were treated with (m)FOLFIRINOX as initial treatment, having nonelevated (i.e., <37 U/ml) serum CA19-9 at baseline.⁴ In this subgroup, serum CEA was elevated in one-third of patients. Nevertheless, both at baseline and at restaging, elevated serum CEA (as measured at baseline) was the only predictor for (worse) OS.

FUTURE

Serum CEA levels at baseline may be a useful tool for both decision-making at initial staging as well as at time of restaging in patients with nonelevated CA19-9. Future research should validate these findings and assess the prognostic value of serum CEA in patients with(out) elevated

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serum CA19-9, including the interaction and correlation between both tumor markers with their prognostic value. Moreover, alternative tumor markers are required as serum CEA at baseline is elevated in only one-third of patients having nonelevated CA19-9.^{2,5}

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REFERENCES

1. Oba A, Del Chiaro M, Satoi S, et al. New criteria of resectability for pancreatic cancer: A position paper by the Japanese Society of Hepato-Biliary-Pancreatic Surgery (JSHBPS). *J Hepatobiliary Pancreat Sci.* 2022;29(7):725–31.
2. Stoop TF, Theijse RT, Seelen LWF, et al. Preoperative chemotherapy, radiotherapy, and surgical decision-making in patients with borderline resectable and locally advanced pancreatic cancer. *Nat Rev Gastroenterol Hepatol.* 2023. <https://doi.org/10.1038/241575-023-00856-2>.
3. Bergquist JR, Puig CA, Shubert CR, et al. Carbohydrate antigen 19–9 elevation in anatomically resectable, early stage pancreatic cancer is independently associated with decreased overall survival and an indication for neoadjuvant therapy: A national cancer database study. *J Am Coll Surg.* 2016;223(1):52–65.
4. Doppenberg D, Stoop TF, van Dieren S, et al. Serum CEA as prognostic marker for overall survival in patients with localized pancreatic adenocarcinoma and non-elevated CA19-9 levels treated with FOLFIRINOX as initial treatment: a TAPS consortium study. *Ann Surg Oncol.* 2023. <https://doi.org/10.1245/s10434-023-14680-0>.
5. Kinny-Köster B, Habib J, Wolfgang CL, He J, Javed AA. Favorable tumor biology in locally advanced pancreatic cancer: Beyond CA19-9. *J Gastrointest Oncol.* 2021;12(5):2484–94.

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