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Prognostic impact of perioperative CA19-9 levels in patients with resected perihilar cholangiocarcinoma

Jong Woo LEE¹, Jae Hoon LEE^{*2}, Yejong PARK², Woohyung LEE², Jaewoo KWON², Ki Byung SONG², Dae Wook HWANG², Song Cheol KIM²

¹Department of Surgery, Hallym University Sacred Heart Hospital, Anyang, Korea

²Department of Hepatobiliary and Pancreatic Surgery, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea

Introduction: The clinical significance of perioperative level of carbohydrate antigen (CA) 19-9 in perihilar cholangiocarcinoma (PHCC) has not been well established. This study aimed to examine whether perioperative change of CA19-9 levels could predict prognosis of patients underwent surgery for PHCC.

Methods: This study included 322 patients who underwent curative resection for PHCC. Patients were divided into 3 groups; normal preoperative normal CA19-9 group (CA19-9 $\leq$ 37 U/mL), normalization group (preoperative CA19-9 $>$ 37 U/mL, postoperative CA19-9 $\leq$ 37 U/mL) and non-normalization group (both preoperative and postoperative CA19-9 $>$ 37 U/mL). The association of clinicopathological factors (including perioperative serum CA19-9 levels) with overall survival (OS) was investigated.

Results: The non-normalization group (82 patients) showed significantly worse OS than normal CA19-9 group (114) and normalization group (126) (5-year OS, 16.9%, 29.4%, and 34.4%; both $p \leq 0.001$). Cut-off points of preoperative 300 U/mL ($p = 0.001$) and postoperative 37 U/mL ($p < 0.001$) showed highest significant prognostic value. In the non-normalization group, patients who underwent R1 resection showed significant worse OS than those who underwent R0 resection (median OS, 10.2 vs. 15.7 months; $p = 0.016$). In multivariable analysis, factors independently associated with worse OS were lymph node metastasis (hazard ratio (HR) 2.07; $p < 0.001$), postoperative CA19-9 $>$ 37 U/mL (HR 1.94; $p < 0.001$), intraoperative transfusion (HR 1.74; $p = 0.002$), advanced T stage (T3, 4) (HR 1.67; $p = 0.006$).

Conclusions: Persistent high CA19-9 level after resection of PHCC with curative intent was associated with poor OS. R1 resection was associated with poor OS especially in non-normalization group. High postoperative CA19-9 value was also independent significant prognostic factor in resected PHCC.

Corresponding Author: Jae Hoon LEE (hbpsurgeon@gmail.com)

Presenter: Jong Woo LEE (hy_thename@hanmail.net)

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