

Response to LTE on Prophylactic Antibiotic Duration

Brittany C. Fields, MD, MPH,* Artem Boyev, DO,* and Ching-Wei D. Tzeng, MD*

Thank you to the authors, Li et al¹, for their interest in and commentary on our article, "Prophylactic Antibiotic Duration and Infectious Complications in Pancreatoduodenectomy Patients with Biliary Stents: Opportunity for De-Escalation."²

The basis for the use of ertapenem as surgical prophylaxis in pancreatoduodenectomy is its longer duration of action (eliminating the need for repeat dosing in longer cases) and extended spectrum coverage against various Gram-positive, Gram-negative, and anaerobic bacteria, including multi-resistant strains.³ Compared to piperacillin-tazobactam, ertapenem demonstrates equal efficacy rates in the treatment of patients with intra-abdominal and postoperative abdominal infections, thus justifying its empiric use in pancreatic surgery when standardizing our prophylaxis in 2010.³

Patients with biliary stents who undergo pancreatoduodenectomy demonstrate a high rate of various Gram-positive and Gram-negative bacteria exhibited on intraoperative bile cultures,^{2,4} with an increasing frequency of *Enterococcus* and *Klebsiella* species isolation over the last 2 decades and increasing *Enterococcus*- and *Enterobacter*-associated resistance demonstrated in the most recent trial of preoperative antibiotics.^{4,5} With these considerations, and before our knowledge of the recent piperacillin-tazobactam vs. cefoxitin trial,⁵ we felt it was both prudent and pragmatic to use ertapenem as our standard choice in 2010, as the best coverage for the most prevalent causative organisms at the time. Certainly, we are reevaluating our practice since the publication of the piperacillin-tazobactam trial.⁵

While we acknowledge that indications for biliary decompression vary across institutions, we have a higher proportion of stented patients compared to the United States population due to our high frequency of neoadjuvant therapy for localized pancreatic cancers.⁶ In our study,² 78.1% (242/310) of our stented cohort underwent neoadjuvant treatment. The remaining patients were stented for the management of obstructive hyperbilirubinemia and/or cholangitis.

The data presented in Table 4² Antibiotic Duration and Culture Results in Patients with the Primary Outcome describes patients who achieved the primary composite outcome (15.5%, 84/542). While theoretical antibiotic adjustment seems ideal, our 5-day median length of stay precludes sufficient time to truly adjust antibiotics to culture data. Instead, we tend to use this information to inform decision-making on antibiotics for treating organ space infections or cholangitis.

Again, we appreciate their commentary and hope to have sufficiently addressed the concerns of Li et al.¹

REFERENCES

1. Li M, Wang H, Ma Z, et al. Comment on "prophylactic antibiotic duration and infectious complications in pancreatoduodenectomy patients with biliary stents: opportunity for de-escalation" [published online ahead of print, Aug 9, 2023]. *Ann Surg*. 2023.
2. Boyev A, Arvide EM, Newhook TE, et al. Prophylactic antibiotic duration and infectious complications in pancreatoduodenectomy patients with biliary stents: opportunity for de-escalation [published online ahead of print, July 3, 2023]. *Ann Surg*. 2023. doi: 10.1097/SLA.0000000000005982.
3. Dela Pena AS, Asperger W, Köckerling F, et al; Optimizing Intra-Abdominal Surgery with Invanz (OASIS)-I Study Group. Efficacy and safety of ertapenem versus piperacillin-tazobactam for the treatment of intra-abdominal infections requiring surgical intervention. *J Gastrointest Surg*. 2006;10:567–574.
4. Kwon W, Jang JY, Kim EC, et al. Changing trend in bile microbiology and antibiotic susceptibilities: over 12 years of experience. *Infection*. 2013;41:93–102.
5. Ellis RJ, Brajcich BC, Bertens KA, et al. Association between biliary pathogens, surgical site infection, and pancreatic fistula: results of a randomized trial of perioperative antibiotic prophylaxis in patients undergoing pancreatoduodenectomy. *Ann Surg*. 2023;278:310–319.
6. Perri G, Prakash L, Qiao W, et al. Postoperative chemotherapy benefits patients who received preoperative therapy and pancreatectomy for pancreatic adenocarcinoma. *Ann Surg*. 2020;271:996–1002.

From the *Department of Surgical Oncology, The University of Texas MD Anderson Cancer Center, Houston, TX.

Disclosure: The authors declare that they have nothing to disclose.

Reprints: Ching-Wei D. Tzeng, MD, Department of Surgical Oncology, The University of Texas MD Anderson Cancer Center, 1400 Pressler St, Houston, TX 77030. E-mail: CDTzeng@mdanderson.org.

Copyright © 2023 The Author(s). Published by Wolters Kluwer Health, Inc. This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

Annals of Surgery Open (2023) 4:e345

Received: 5 September 2023; Accepted: 8 September 2023

Published online 3 November 2023

DOI: 10.1097/AS9.0000000000000345

TABLE 4.
Antibiotic Duration and Culture Results in Patients with the Primary Outcome

	Entire Cohort	Group 1	Group 2	Group 3	P value
Total patients	84 (100%)	34 (100%)	27 (100%)	23 (100%)	
Cultures drawn	47 (56.0%)	16 (47.1%)	16 (59.3%)	15 (65.2%)	0.366
Cultures positive	42 (50.0%)	14 (41.2%)	13 (48.1%)	15 (65.2%)	0.199
Enterococcus species	27 (32.1%)	10 (29.4%)	10 (37.0%)	7 (30.4%)	0.801
Escherichia coli	10 (11.9%)	6 (17.6%)	1 (3.7%)	3 (13.0%)	0.223
Klebsiella pneumoniae	6 (7.1%)	3 (8.8%)	0 (0.0%)	3 (13.0%)	0.169
Staphylococcus aureus	4 (4.8%)	1 (2.9%)	1 (3.7%)	2 (8.7%)	0.677
Streptococcus species	10 (11.9%)	4 (11.8%)	3 (11.1%)	3 (13.0%)	>0.999
Candida species	14 (16.7%)	6 (17.6%)	4 (14.8%)	4 (17.4%)	>0.999
Other	8 (9.5%)	4 (11.8%)	2 (7.4%)	2 (8.7%)	0.898

Group 1 received antibiotics ≤ 24 hours, group 2 >24 and ≤ 96 hours, group 3 >96 hours.
 Percentages are the percentage of column unless otherwise specified.