Editorial Commentary

Safety of perioperative low dose aspirin therapy in major lung resection

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Provenance: This is an invited article commissioned by the Academic Editor Shuangjiang Li (Department of Thoracic Surgery and West China Medical Center, West China Hospital, Sichuan University, Chengdu, China).

Comment on: Stamenovic D, Schneider T, Messerschmidt A. Aspirin for patients undergoing major lung resections: hazardous or harmless? Interact Cardiovasc Thorac Surg 2019;28:535-41.

Submitted Jun 28, 2019. Accepted for publication Aug 08, 2019.
doi: 10.21037/jtd.2019.08.43
View this article at: http://dx.doi.org/10.21037/jtd.2019.08.43

Aspirin is widely used for the primary and secondary prevention of cardiovascular disease. Gu *et al*. estimated the prevalence of preventive aspirin use in the US adult population from the National Health and Nutrition Examination Survey, 2011–2012, and about one-third of the US adults aged more than 40 years used aspirin for preventive purposes (1). Some population-based studies reported that among patients diagnosed with lung cancer, 15.3% in Korea and 26% in Sweden were aspirin users (2,3). Accordingly, thoracic surgeons are frequently confronted with patients taking aspirin and need to decide whether to continue or discontinue aspirin in the perioperative period.

Perioperative aspirin could increase the risk of a bleeding complication. However, the discontinuation of aspirin could increase the risk of thromboembolic complication due to aspirin withdrawal syndrome and increased coagulability caused by a systemic reaction to surgery (4).

In 2014, the result of the Perioperative Ischemic Evaluation 2 (POISE-2) trial was published (5). This was the largest randomized trial on the use of aspirin in the perioperative period. In the trial, 10,010 patients who were scheduled for noncardiac surgery and were at risk for vascular complications were assigned to receive aspirin or placebo. The study showed that there was no difference in death or non-fatal myocardial infarction between the groups. Major bleeding was more common in the aspirin group than in the placebo group. This study suggests that perioperative aspirin might be harmful. However, patients who received a bare-metal coronary stent less than 6 weeks before surgery or a drug-eluting coronary stent less than 1 year before surgery were excluded from this study. These patients are at greater risk of perioperative myocardial infarction and are most likely to benefit from aspirin therapy. Moreover, in a subgroup analysis of the POISE-2 trial, perioperative aspirin reduced the risk for death or non-fatal myocardial infarction in patients who had undergone a prior percutaneous coronary intervention (PCI) (6).

Stamenovic *et al*. evaluated the perioperative use of aspirin in patients undergoing major lung resections (7). Before this study, there had been only a few retrospective studies with relatively small numbers of patients in the field of thoracic surgery (8,9). Among a total of 486 patients, 329 did not use aspirin (group ASA-0), while 157 did (group ASA-1), in the perioperative period. Two hundred and seventy-three patients (56.2%) underwent video assisted thoracoscopic surgery (VATS) and 213 (43.8%) underwent thoracotomies. There was no difference in the surgical approach (VATS *vs.* thoracotomy) and type of surgical resection between the groups. In terms of postoperative outcomes, there was no difference in intraoperative bleeding, blood loss, blood transfusion, thoracotomy conversion from VATS, cardiovascular complications, and death between the groups. Although there was a trend towards a higher rate of postoperative

complications in the ASA-1 group, this might have been related to more comorbidities and older age. Thoracotomy was associated with more blood loss than VATS (P<0.001). Pneumonectomy was associated with more blood loss than lobectomy or segmentectomy (P<0.001). This study showed that perioperative aspirin does not increase the risk of bleeding complication in thoracic surgery, even in thoracotomy and pneumonectomies.

There are two points to be considered. First, there is no mention about for whom to continue or discontinue aspirin therapy in the manuscript. Group ASA-0 may have included those who were not taking aspirin and those who discontinued the aspirin therapy in the perioperative period. The patients who discontinued aspirin therapy may have had lower cardiovascular risks or higher bleeding risks, such as patients with expected pleural adhesion and those who underwent more extensive surgery. Continuing aspirin therapy in the perioperative period may have a greater benefit for patients with a higher cardiovascular risk, such as patients who have undergone a recent PCI. However, the routine use of aspirin may be harmful. Aspirin increased the risk of major postoperative bleeding in the POISE-2 trial (5). It seems to be more difficult to control bleeding from the chest wall secondary to the takedown of adhesion with antiplatelet therapy (9,10). For now, we still have no solid evidence about for whom to continue or discontinue aspirin therapy in thoracic surgery.

Second, the patients who were taking antiplatelet agents other than aspirin were excluded. Previously, we reported increased postoperative bleeding in patients who had undergone dual antiplatelet therapy (aspirin + clopidogrel) compared with other antiplatelet therapies in thoracoscopic surgery for lung cancer (P=0.005) (9). Clopidogrel or dual antiplatelet therapy is a more potent antiplatelet therapy than low-dose aspirin (11) and we still do not have sufficient data about these effects of perioperative antiplatelet therapy other than aspirin on the operative outcomes.

In conclusion, aspirin therapy can be used in major resection surgery without an increase in bleeding complications in patients with a higher cardiovascular risk. Surgeons need to decide whether to continue or discontinue the antiplatelet therapy, considering the cardiovascular risk and the risk of bleeding.

Acknowledgments

None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Cite this article as: Yu WS, Lee CY. Safety of perioperative low dose aspirin therapy in major lung resection. J Thorac Dis 2019;11(Suppl 15):S1897-S1899. doi: 10.21037/jtd.2019.08.43

