

Blood transfusion and postoperative complications: a cautionary comment

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In the recent issue of *JAMA Surg*, Ecker and coworkers (1) reported a large study aimed to evaluate trends in transfusion rates for major abdominal oncologic resections. This retrospective population-based study was using the American College of Surgeons National Surgical Quality Improvement Project database. Another study by Ferraris *et al.* (2) aimed to determine the role of transfusion for patients' postoperative outcomes. This study was based on the same database. Ecker *et al.* (1) found transfusion was associated with occurrence of wound infection, renal insufficiency, and myocardial infarction. Ferraris *et al.* (2) revealed that transfusion has a dose-dependent adverse effect on postoperative outcomes. Though some of these findings were confirmed by another population based study (3), we believe that some issues of these two articles require consideration.

First, though a significant trend toward decreasing rates of transfusion during the past decade was observed, the rate of wound infection or renal insufficiency was not present a declining trend. Moreover, the rate of myocardial infarction was even rising. Since transfusion was associated with such complication, why their rates were not proportional to the declining trend of transfusion?

Among patients with malignant tumors, massive haemorrhage during surgery is the major cause of transfusion within 24 hours. Surgery complication and scope and longer operative time, which are closely related to tumor variables, are main risk factors of massive haemorrhage. Just as Ecker and coworkers' finding, transfusion rate is the highest among patients who underwent liver resection, while patients underwent gastric resection showed the lowest transfusion rate (1). The more complicated, the bigger scope, and the longer operative time of surgery, the higher rate of

postoperative complications will occur. On the other hand, surgeon experience and intraoperative complications may also contribute to blood loss and the decision of transfusion. Therefore, the factors that predispose patients to transfusion may be the real cause of postoperative complications, rather than transfusion. If all tumor variables, such as tumor stage, were comparable between patients with or without transfusion, the conclusion of the significant association between transfusion and postoperative complications would be more reliable. Unfortunately, all tumor variables were not described in these two studies (1,2). Interestingly, studies using propensity score-matching analysis to adjust differences in tumor characteristics found that the worse oncological outcomes after surgery was caused by the clinical circumstances requiring the transfusion, not by the transfusion itself (4-7). On the contrary, meta-analysis without adjusting tumor characteristics supported that transfusion was associated with negative prognoses for patients with gastrointestinal tumors (8-10).

The aim of transfusion is to maintain patients' total blood volume. Blood loss is the driving force of postoperative complications. If transfusion becomes necessary, it will not jeopardize patients' life.

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Footnote

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

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References

1. Ecker BL, Simmons KD, Zaheer S, et al. Blood Transfusion in Major Abdominal Surgery for Malignant Tumors: A Trend Analysis Using the National Surgical Quality Improvement Program. *JAMA Surg* 2016;151:518-25.
2. Ferraris VA, Davenport DL, Saha SP, et al. Surgical outcomes and transfusion of minimal amounts of blood in the operating room. *Arch Surg* 2012;147:49-55.
3. Whitlock EL, Kim H, Auerbach AD. Harms associated with single unit perioperative transfusion: retrospective population based analysis. *BMJ* 2015;350:h3037.
4. Müller SA, Mehrabi A, Rahbari NN, et al. Allogeneic blood transfusion does not affect outcome after curative resection for advanced cholangiocarcinoma. *Ann Surg Oncol* 2014;21:155-64.
5. Warschkow R, Güller U, Köberle D, et al. Perioperative blood transfusions do not impact overall and disease-free survival after curative rectal cancer resection: a propensity score analysis. *Ann Surg* 2014;259:131-8.
6. Yang T, Lu JH, Lau WY, et al. Perioperative blood transfusion does not influence recurrence-free and overall survivals after curative resection for hepatocellular carcinoma: A Propensity Score Matching Analysis. *J Hepatol* 2016;64:583-93.
7. Boehm K, Beyer B, Tennstedt P, et al. No impact of blood transfusion on oncological outcome after radical prostatectomy in patients with prostate cancer. *World J Urol* 2015;33:801-6.
8. Amato A, Pescatori M. Perioperative blood transfusions for the recurrence of colorectal cancer. *Cochrane Database Syst Rev* 2006;(1):CD005033.
9. Liu L, Wang Z, Jiang S, et al. Perioperative allogeneic blood transfusion is associated with worse clinical outcomes for hepatocellular carcinoma: a meta-analysis. *PLoS One* 2013;8:e64261.
10. Yao HS, Wang Q, Wang WJ, et al. Intraoperative allogeneic red blood cell transfusion in ampullary cancer outcome after curative pancreatoduodenectomy: a clinical study and meta-analysis. *World J Surg* 2008;32:2038-46.

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