

Blood transfusion in major non-emergency surgery: The urgent necessity to significantly decrease its indication

Editorial

Several large, randomized, international, controlled clinical trials have clearly demonstrated that a restrictive red blood cell transfusion strategy results in similar or improved patient outcomes compared to a more liberal strategy.¹⁻⁴ There has been a tendency to diminish blood transfusion (BT), in part due to the results of these and other clinical studies, in addition, to the increased necessity to reduce medical expenditures. These facts have led to the development of initiatives that promote transfusion practice with a goal of minimizing non-indicated use.⁵⁻⁸ These measures are in accord with the fact that it is getting more difficult to obtain adequate donors lately, and that more people rejects allogeneic BT for several reasons.

Patient blood management strategies are designed to optimize erythropoiesis, to minimize blood loss, and to manage anemia as a means to promote the availability of blood transfusion alternatives.⁹⁻¹³ In order to diminish the incidence of BT it is important to correct pre-operative anemia and to reduce operative blood loss in surgical patients, and the utilization of lower hemoglobin triggers for red blood cell transfusion.

Lammi JP et al.¹⁴ studied the use of blood transfusions in 1404 patients undergoing pancreatic resections in Finland. The authors tried to improve and unify blood transfusion (BT) policies in order to decrease and optimize the use of blood products. They found no differences among high, medium and, low-volume centers in BT utilization, trigger points or the use of reserved blood units after pancreato- duodenectomy or total pancreatectomy. Although, only minor changes in BT trends were found, the lowering of the transfusion trigger point and the best use of reserved blood units occurred only in high-volume centers.¹⁴ This is already a plausible finding since there is compelling evidence indicating that BT is excessive and sometimes unnecessary worldwide. Nearly 14million units of blood are donated annually in the USA, and about 4million people receive BT every year.^{15,16} Blood transfusion administration in surgical and critical care settings varies between 30-100% of patients. Lammi JP et al.¹⁴ observed that 65.9% of their study patients received BT. The mean number of red BT units was 5.22/patient (1.9–8.76). The mean trigger point for BT was an Hb level of 8.6g/dL. The mean percentage of blood units used out of the reserved red blood was 63.4%. We can see that the percentage of BT is still elevated, the trigger Hb level and the utilization of reserved blood units is also high. Although, the authors did not mention BT related complications in their study, the utilization of reserved blood is strongly associated to ischemic complications. Stored red blood cells are known to have decreased 2,3 DPG in the cell membrane, hence, they are less deformable, less likely to deliver oxygen to the tissues, and with greater tendency to produce capillary obstruction.¹⁶ On the other hand, the mechanisms responsible for the increased incidence of infectious complications are due to the immunosuppressive effects of BT. Administration of blood products causes profound negative effects on the human immune system, a condition termed transfusion-related immune modulation.¹⁷

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Another reason to decrease BT is the fact that blood donations have significantly diminished mainly because of decreasing number of qualified donors.¹⁸ This fact has resulted in a shortage of blood supply in blood banks worldwide which makes it necessary to seek out new treatment options.¹⁹ Although, alternatives to BT and other treatment options exist, they are seldom utilized.

BT in major surgery was associated with worse prognosis even in patients with hematocrits as low as 21% (hemoglobin of 7g/dL). The risk of death within 30 days of surgery was almost 6 times greater. Moreover, BT was found to be an independent variable for increased infections and ischemic complications, such as myocardial infarction, renal compromise and failure, and stroke. Additionally, transfused patients had prolonged mechanical ventilation, higher incidence of atrial fibrillation, longer hospital length of stay, increased costs, and higher morbidity and mortality.^{20,21} All of these adverse clinical events are strong reasons to try hard enough to avoid BT in major surgery.

Lammi JP et al.¹⁴ mentioned that the previous utilization of a new transfusion form and national education have been effective methods in diminishing the use of blood products in major surgery in Finland. Alternatives to allogeneic BT and No-blood program implementation will further decrease the rate of BT, and will optimize the use of blood products for their utilization in emergency hemorrhagic cases.²²⁻²⁴

Conclusion

In conclusion, unnecessary blood transfusions should be avoided to further reduce the risk for infection and other ischemic complications. Indeed, there is a clear medicine based evidence of the shortcomings of BT in the setting of major surgery. The evidence that BT carries significant risks points out to avoid BT when possible. This adverse outcome of BT is to admonish the medical community and it is a serious call for caution to accomplish a detailed and conscious revision of their routine daily medical practice.

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Conflicts of interest

Author declares there are no conflicts of interest towards the article.

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