



Using Group A Plasma to Support Emergently Bleeding Patients

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Background

Widespread adoption of massive transfusion protocols has led to substantially increased plasma use in the United States. A disproportionate amount of this growth has involved group AB plasma, a blood component that historically has been designated as “universally compatible” for transfusion. While only 4-percent of the U.S. population is group AB, data from earlier in this decade demonstrated that 7-to-25-percent of plasma distributed by the United States’ largest blood centers was AB.¹

This imbalance between AB donors and AB plasma use strains our increasingly limited AB donor base and, thus, has the potential to compromise patient care. Therefore, it is important that blood centers and hospitals work together – in a sustainable, evidence-based manner – to maximize the outcomes of all plasma-using patient groups. Group A plasma, being more abundant than its AB counterpart, has the potential to relieve some of the current pressure on the AB plasma inventory, especially during the management of rapid, acute bleeding. The clinical impact of anti-B isoagglutinins in A plasma is still being explored; however, centers are attempting to mitigate risk through either limiting the total number of A plasma units or using low-titer plasma.

A Growing Shift in Practice Nationwide

In recent years, the use of group A – instead of AB – plasma during the initial resuscitation of adult trauma patients has gained support. A comprehensive survey published in 2016 found that 63-percent of participating American Level 1 trauma centers were using group A plasma to support the transfusion needs of their trauma patients having unknown blood types. Notably, 62-percent of these facilities did not limit the volume of group A plasma administered and 79-percent did not titer for anti-B antibodies.²

Arguments for the Safety of Group A Plasma in Emergently Bleeding Adults

The main points in favor of this approach can be distilled into four arguments:³

- Unexpected and significant blood loss typically is replaced (at least at first) with group O packed red blood cells (RBCs) or low-titer group O whole blood, thereby reducing the susceptibility to hemolysis from the anti-B isoantibodies contained in group A plasma;
- Eighty-to-85-percent of patients will type as group O or A and therefore have red cells that are compatible with group A plasma;

Key Points

- The use of group A plasma during the early resuscitation of adult trauma patients is a rapidly growing practice.
- This approach is supported by a large body of observational evidence demonstrating that group B and AB patients transfused with group A plasma (that in most cases has not been titered for anti-B antibodies) have benefited from this product without experiencing a greater incidence of mortality or morbidity compared to their counterparts who receive ABO-compatible plasma.
- The up-front use of group A plasma for the resuscitation of traumatically bleeding adult patients expands our ability to manage the transfusion needs of this patient population while also conserving group AB plasma for those patients who absolutely require it.
- Many facilities now extend this approach not just to trauma resuscitation but also to the transfusion support of other (i.e., non-trauma) patients who are bleeding massively and/or require blood on an “emergency release” basis.

- Approximately 80-percent of group B and AB recipients will be secretors of soluble B substance which will facilitate neutralization of the anti-B contained in transfused group A plasma; and
- Experiences from the transfusion of group A platelets to group B and AB patients having adult-sized blood volumes have demonstrated that complications are uncommon.

Clinical experiences supporting the safety and efficacy of group A plasma in the early resuscitation of adult trauma patients were initially limited to small patient cohorts in retrospective, single-center reviews.^{4,6} Within the past few years, however, two large, multicenter studies have been published providing further evidence in support of this practice.

Multicenter Studies Supporting the Safety of Group A Plasma in Adult Trauma

- The STAT study³ was a multicenter, retrospective review involving 17 trauma centers that compared group A plasma support of 354 group B and AB adult trauma patients (“plasma incompatible” group) versus 809 group A trauma patients (“plasma matched” group). Its main findings were that:
 - No statistically significant differences were seen between the two study groups for either the primary outcome (in-hospital mortality) or the secondary outcomes (mortality at ≤ 24 hours or hospital length of stay);
 - No statistically significant differences were seen in the numbers of blood products transfused during the initial resuscitation between study groups; and

- No acute transfusion reactions were reported in the group of patients receiving ABO-incompatible plasma.
- The EAST study group⁷ conducted a multicenter, retrospective review involving 8 trauma centers in which they compared 120 adult trauma patients having blood types B and AB who received at least one unit of group A plasma (“plasma incompatible”) to 1,416 patients who received ABO blood group-compatible plasma. Their findings were that:
 - No statistically significant differences were seen between the two groups in rates of morbidity or mortality;
 - No increased rates of thrombotic events, pneumonia, sepsis, renal failure, acute respiratory distress syndrome (ARDS), or transfusion-related acute lung injury (TRALI) were observed in patients receiving incompatible plasma (plus, no hemolytic transfusion reactions were reported in this group); and
 - Greater numbers of RBC and plasma transfusions were seen in the “plasma incompatible” group; however, the study was not designed to assess causality for those differences.

Summing up: What’s Happening Now with Respect to Usage of Group A and AB Plasma during the Primary Management of Rapid, Acute Bleeding?

- For group A plasma:
 - This product – in most cases un-titered for anti-B – is increasingly being used during at least the initial (i.e., the first 2-to-4 plasma units) resuscitation of massively bleeding adult trauma patients. Experience to date suggests this practice is safe and efficacious.
 - Many, but not all, trauma programs do not have a limit on the number of group A plasma units that can be administered to patients of an unknown blood group.
 - Many facilities have taken their trauma resuscitation protocols and generalized them to support all acutely and rapidly bleeding patients who require emergency-released blood.^{4,7}
 - Available evidence does not support utilization of group A plasma in routine, non-bleeding group B and AB patients.
- For group AB plasma:
 - This product continues to be used by most American programs in support of massively bleeding children whose ABO types are not yet known (with reasonable efforts subsequently being made to switch to ABO type-specific plasma as soon as the patient’s type is known).

Conclusions

The preponderance of existing evidence supports the use of group A plasma during at least the initial transfusion management of emergently bleeding adult patients. Implementing this practice in all transfusion services that support such patients will reduce strains on the limited group AB plasma supply while maintaining patient safety. To date, trials have focused primarily on the use of thawed, previously-frozen, group A plasma in support of adult trauma patients.

Increasingly, however, this practice has been implemented and/or undergone exploration in emergent non-trauma settings as well as in concert with the use of group A liquid plasma (a product that facilitates maximally rapid transfusion support⁸). Further discussion about liquid plasma can be found in the February 2019 issue of ABC’s *Blood Bulletin*.⁹ To learn more about the use of group A plasma in support of emergently bleeding adult patients, we recommend the reader contact his/her local blood center.

References:

1. Yazer M, Eder AF, Land KJ. How we manage AB plasma inventory in the blood center and transfusion service. *Transfusion* 2013;53:1627-33.
2. Dunbar NM, Yazer MH, Biomedical Excellence for Safer Transfusion Collaborative. A possible new paradigm? A survey-based assessment of the use of thawed group A plasma for trauma resuscitation in the United States. *Transfusion* 2016;56:125-9.
3. Dunbar NM, Yazer MH, Biomedical Excellence for Safer Transfusion (BEST) Collaborative and the STAT Study Investigators. Safety of the use of group A plasma in trauma: the STAT study. *Transfusion* 2017;57:1879-84.
4. Chhibber V, Greene M, Vauthrin M, et al. Is group A plasma suitable as the first option for emergency release transfusion? *Transfusion* 2014;54:1751-5.
5. Mehr CR, Gupta R, von Recklinghausen FM, et al. Balancing risk and benefit: maintenance of a thawed group A plasma inventory for trauma patients requiring massive transfusion. *J Trauma Acute Care Surg* 2013;74:1425-31.
6. Zielinski MD, Johnson PM, Jenkins D, et al. Emergency use of prethawed group A plasma in trauma patients. *J Trauma Acute Care Surg* 2013;74:69-75.
7. Stevens WT, Morse BC, Bernard A, et al. Incompatible type A plasma transfusion in patients requiring massive transfusion protocol: Outcomes of an Eastern Association for the Surgery of Trauma multicenter study. *J Trauma Acute Care Surg* 2017;83:25-9.
8. Cardenas JC, Holcomb JB. Time to plasma transfusion: a patient centered approach and modifiable risk factor. *Transfusion* 2017;57:869-73.
9. Li M, Gresens C. The appropriate use of liquid plasma. *Blood Bulletin* 2019;19:1-2.

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