

Case Report

Transfusion Errors in the Thai Anesthesia Incidents Study (THAI Study) : Three Cases

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Of 163,403 recorded cases of anesthesia in the Thai Anesthesia Incidents Study (THAI Study), transfusion errors occurred thrice.

Case #1: a 68-year-old male, blood group A, undergoing hepatectomy, received two units of PRC and four units of FFP (all units were group A), but two of the FFP units were given to the wrong patient because the caregiver did not check the patient-identification on all of the blood bags.

Case #2: a 42-year-old female, blood group A, undergoing emergency exploratory laparotomy, received 250 mL of group B-blood. Skin rashes, a clue for diagnosis of transfusion error, were observed in the postoperative period. The error occurred because the caregiver did not check the patient-identification before starting the transfusion.

Case #3: a 42-year-old female, blood group O, undergoing hysterectomy, received 430 mL of group AB-blood. More blood was requested in the ICU and it was discovered that the new bag was group O instead of AB. Mislabeling of the blood sample at the first blood request accounted for the error even though blood group O was recorded on the patient's OPD chart. The first two patients developed minor adverse reactions (grade 1) whereas the third developed a severe reaction (grade 3). All of the patients responded well to treatments. Accordingly, the system for preventing transfusion errors has been improved at both hospitals.

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Although transfusion errors occur infrequently during anesthesia, they may be the cause of severe reactions even death. Hemovigilance is an effective system either for monitoring or preventing the incidence of transfusion errors. Western countries such as France ⁽¹⁾, the United Kingdom ⁽²⁾ and the United States of America ⁽³⁾ have established compulsory hemovigilance systems. The incidence of major ABO mismatching in France, reported by Andreu ⁽¹⁾ was approximately 1 in 138°000 units.

There are variation in hemovigilance system in Thailand; however, Chiewsilp did survey transfusion errors in 1999 and 2002 and reported the incidence of major ABO in Thailand was approximately 3 in 30°000

units and 3 in 100°000 units, respectively (Proceeding Of The Annual Meeting Of The Thai Red Cross, Bangkok, 2002). No other studies have been published; particularly on the incidence of transfusion errors during anesthesia. This article presented 3 cases of transfusion error occurred related to anesthesia.

Material and Method

The Thai Anesthesia Incidents Study (THAI Study) was a multi-center study comprising 20 hospitals: 7 university-, 5 tertiary-, 4 secondary- and 4 primary-care. We monitored the incidence of adverse events between February 1, 2003 and January 31, 2004. The THAI Study was approved by the Institutional Ethics Review Boards at each institution. Details of age, sex, pre-anesthetic conditions, anesthetic man-

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agement, intraoperative events and perioperative complications (within 24 hours) of consecutive patients were recorded on a standardized form.

Details of transfusion errors (including blood and blood products) were recorded by the attending anesthesiologist or nurse anesthetist and site manager. The recorded form was then reviewed by three peer reviewers to identify the clinical risk factors, contributing factors and corrective strategies.

The 4-stage WHO grading scale of transfusion error defines: Grade 1 the absence of any immediate or long-term vital threat; Grade 2 some long-term morbidity; Grade 3 an immediate vital threat; and, Grade 4 death of the patient⁽¹⁾.

Results

During the study, 163,403 patients were monitored for reactions. Six patients who experienced reactions related to blood transfusions were reported. Three of the six experiencing allergic reactions were reported on the perioperative allergic reaction part of the form. This report therefore concentrates on the three cases of transfusion errors.

Case #1

A 68-year-old male, ASA class II, blood group A underwent hepatectomy. During the operation, the patient's hematocrit dropped to 21%. He was therefore given 2 PRC units and 4 FFP units to achieve normovolemia. After surgery, it was discovered that he had received 2 units of the wrong FFP. Fortunately, his blood group (A) was the same group as the FFP received. The initial treatment was a loop diuretic and NaHCO₃. The severity of the reaction was grade 1. The error occurred because the caregiver did not check the patient-identification on all of the blood bags before transfusing. After the first week of follow-up, there was no persistent adverse reaction.

Case #2

A 42-year-old female, ASA class III, blood group A underwent an emergency exploratory laparotomy. The hematocrit before surgery was 29%. She received 1 unit (about 250 mL) of blood transfusion during the operation. Postoperatively, skin rashes were observed and it was discovered that she had been given the wrong blood transfusion (blood group B). The reaction-severity was grade 1. The initial treatment was a discontinuation of the transfusion, administration of iv fluids, a loop diuretic and NaHCO₃. The error occurred because the patient-identification was not veri-

fied prior to transfusing. Remedial treatment was effective and within the first week of follow-up, no adverse reaction persisted.

Case #3

A 62-year-old female, ASA class II, underwent hysterectomy. One month before surgery, her blood test revealed she had group O and this information was recorded on her OPD Card. During the surgery, the estimated blood loss from the field was approximately 1000 mL. The patient's blood pressure was unstable despite administering 1000 mL of colloids and 430 mL of blood. The patient-identification on the blood bag, blood group AB, was correctly checked.

In the ICU, more blood was requested post-operatively because her blood pressure and hematocrit were dropping. At this point, it was discovered that the new donor's blood was group O instead of group AB as previously given. The incorrect blood transfusion was noted and appropriate treatments started.

The patient developed hematuria, acute renal failure, disseminated coagulopathies. New surgery was necessary to stop the intra-abdominal bleeding. The reaction-severity was grade 3. However, she responded well to treatment but her hospital stay was prolonged for seven days. The error occurred because of mislabeling of the blood sample at the first request.

Discussion

The incidence of transfusion error in this report was approximately 1 in 56,000 cases of anesthesia. The incidence was calculated per anesthetic case because the numbers of blood used were not recorded in the database. Therefore, this incidence report will not easily compare with other studies that are based on the incidence per units of blood.

Human error was at fault in all three cases; 2 errors by caregivers and 1 by the blood sample collector. Williamson⁽⁴⁾ reported that 52% of serious transfusion hazards were the result of human error. All the errors we are reporting occurred in two teaching hospitals that already had transfusion error prevention policies and systems. The risk factors involved, as described by attending anesthesiologists, included emergency situations⁽⁵⁾ as in case #2, no double-checking, and carelessness.

The attending anesthesiologists propose that the errors would be minimized by increased attention and careful or double-checking before transfusing. A good way to ensure better blood transfusions, Provan

said ⁽⁶⁾, is to give them only when absolutely necessary. In retrospect, then, only patients who experienced massive blood loss needed transfusion. The other one with a hematocrit of 29% that received 1 transfusion unit was probably unnecessary.

Normally, patients with an ASA I-II who receive adequate fluid replacement (normovolemic hemodilution) can tolerate a blood loss as long as the hematocrit remains above 25% ⁽⁷⁾. Other strategies for minimizing the use of blood have been reviewed by Rosenblatt ⁽⁸⁾ and Muller ⁽⁹⁾.

Vis- -vis reaction-severity, the patient with blood group O, who received blood group AB, had a severe reaction (grade 3); whereas the other two recipients (both of blood group A and who received blood group B/or unplanned group A, respectively) had only mild reactions (grade 1). All three cases were given appropriate treatments and all three patients responded well; notably, the patient with the severe reaction had completely recovered by the first week follow-up. Immediate re-cross-matching to avoid any possibility of a transfusion error was not done in all cases perhaps because detecting the error was delayed and the blood bags had already been discarded.

As a result of these errors, one hospital has improved its cold blood storage protocols, and both hospitals have reviewed the policies and guidelines for preventing transfusion errors.

Conclusion

Transfusion errors were reported in 3 of 163,403 cases of anesthesia. The errors were all the result of human error. The reaction-severity ranged between grade 1 (2 cases) and grade 3 (1 case). All of the patients responded to the rescue treatment. The system for preventing transfusion errors has been improved at both hospitals.

Strategies for risk reduction:

1. Healthcare personnel should be adequately trained.

2. Management of the transfusion system should be improved and regularly audited.

3. The system could perhaps follow the protocols of the American Association of Blood Banks (AABB) ⁽¹⁰⁾, including:

3.1 Double-checking patient-identification (by 2 qualified healthcare workers) before transfusing;

3.2 Ensuring the patient's blood group noted on the OPD card matches the patient-iden-

tification on the blood bags before transfusing; and,
3.3 Adopting policies for the effective, minimal use of blood transfusions.

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การให้เลือดผิดกลุ่มในโครงการเฝ้าระวังภาวะแทรกซ้อนทางวิสัญญีในประเทศไทย: รายงานผู้ป่วย 3 ราย

สมบูรณ์ เทียนทอง, ธนู หินทอง, ยอดยิ่ง ปัญจสวัสดิ์วงศ์

รายงานผู้ป่วย 3 ราย ที่ได้รับเลือด/ส่วนประกอบของเลือดผิดกลุ่มหรือผิดคน จากผู้ป่วยที่ได้รับยาระงับความรู้สึกทั้งสิ้น 163,403 ราย รายที่ 1 ผู้ชาย อายุ 68 ปี เลือด group A ทำผ่าตัด hepatectomy ได้รับ PRC 2 unit และ FFP 4 unit โดย FFP 2 unit นั้นเป็นของผู้ป่วยรายอื่นซึ่งมีเลือด group A เช่นเดียวกัน สาเหตุเกิดจากผู้ให้ไม่ได้ตรวจสอบชื่อผู้ป่วยในเลือดทุก unit รายที่ 2 ผู้หญิง 42 ปี เลือด group A ทำผ่าตัด emergency exploratory laparotomy ได้รับเลือด 250 มล. ผู้ป่วยมีผื่นตามตัว ตรวจสอบพบว่าเลือดที่ได้เป็น group B สาเหตุเกิดจากผู้ให้ไม่ได้ตรวจสอบชื่อผู้ป่วยก่อนให้เลือด รายที่ 3 ผู้หญิง 62 ปี เลือด group O ทำผ่าตัด hysterectomy ได้รับเลือด group AB 430 มล. หลังผ่าตัดได้ขอเลือดให้อีก พบว่าเลือดที่ได้มาใหม่เป็น group O สาเหตุเกิดจากการสลับ specimen ที่ส่งขอเลือดในครั้งแรก ทั้งที่ก่อนผ่าตัดมีการบันทึกใน OPD card ว่าผู้ป่วยเลือด group "O" ผู้ป่วยรายที่ 1 และ 2 มีอาการผิดปกติจากการให้เลือดเพียงเล็กน้อย (grade 1) ในขณะที่รายที่ 3 มีอาการที่รุนแรง (grade 3) ผู้ป่วยได้รับการรักษาและมีอาการดีขึ้นเป็นปกติทุกราย จากเหตุการณ์นี้ทำให้โรงพยาบาล ที่เกิดอุบัติการณ์มีการปรับปรุงระบบการให้เลือดที่ดีขึ้น