Suspected Transfusion-transmitted Bacterial Infections Due to Platelet Components - Caution on transfusion-transmitted bacterial infection due to platelet components -

Two cases of transfusion-transmitted bacterial infection (TTBI) involving two divided platelet units prepared from a single apheresis donation were reported to the Committee on Blood Products of the Pharmaceutical Affairs and Food Sanitation Council held on December 2, 2022. Blood culture tests detected *Morganella morganii* in a platelet component unit that was discontinued during transfusion and 2 recipients, one of whom died of septic shock.

Approximately 1 to 2 cases of TTBI involving platelet components are confirmed every year. Despite the Japanese Red Cross Society's (JRCS) safety measures to prevent bacterial contamination in blood components for transfusion, bacterial contamination in blood bags cannot be completely prevented. For further steps, JRCS is preparing to implement bacterial screening tests in platelet components.

Case Summary

In the following 2 cases, bacterial infection resulted from divided platelet units prepared from a single apheresis collection. Summaries of the cases are as below.

Case 1

Patient	Primary disease and other relevant history	Blood component involved
Male, Age 70s	Malignant tumor	Irradiated Platelet Concentrate, Leukocytes Reduced (Ir-PC-LR) (3 days after blood collection)

[Clinical course]

Day of transfusion	Before transfusion	Body temperature, 37.2°C.
	50 min after start of transfusion	Since symptoms including headache, nausea, and cough developed, the transfusion of the platelet component was discontinued (volume of transfusion: approx. 40 mL).
	2 hrs after start of transfusion	Body temperature, 39.8°C.
1 day after transfusion		A blood culture test was performed on the patient's blood samples.
2 days after transfusion		The blood culture test identified *Morganella morganii*. The patient was started on meropenem hydrate.

Case 2

Patient	Primary disease and other relevant history	Blood component involved
Male, Age 70s	Transferred from another hospital for emergency surgery for angina pectoris.	Irradiated Platelet Concentrate, Leukocytes Reduced (Ir-PC-LR) (3 days after blood collection)

[Clinical course]

Day of transfusion		Cefazolin sodium was administered as prophylaxis against surgical site infection.
Day of transfusion	Before transfusion	Body temperature, 35.9°C; blood pressure, 86/84 mmHg; and oxygen saturation, 97%. An entire unit of platelet component was transfused during surgery.
	After transfusion	Body temperature, 35.8°C; blood pressure, 61/45 mmHg; pulse 103 beats/min; and oxygen saturation, 98%.
1 day after transfusion		A rapid decrease in blood pressure was noted immediately after admission to the ICU. Multi-organ dysfunction developed. A blood culture test was performed on the patient's blood samples. The patient was started on meropenem hydrate and vancomycin hydrochloride.
2 days after transfusion		Extracorporeal membrane oxygenation was started. The blood culture test identified *Morganella morganii*.
3 days after transfusion		The patient died of septic shock.

Results of the Japanese Red Cross Society's Investigation of Case 1 and Case 2

[Results of culture and bacterial identification tests on the blood products]

- Test results of the platelet component which was discontinued in Case 1
  - ·Bacterial isolation/identification: *Morganella morganii*
  - ·Endotoxin quantitation: 2,000 pg/mL or more (cutoff value: 1.0 pg/mL)
- Test results of source plasma that was prepared from the donated blood implicated in Case 1 and Case 2*
  *In addition to the platelet component used in Case 1 and Case 2, source plasma had been prepared from the same donated blood.
  - ·Sterility test: negative (no bacterial growth observed)
  - ·Endotoxin quantitation: 0.8 pg/mL or less (cutoff value: 1.0 pg/mL)

The case report was prepared based on materials for the 1st 2022 meeting of the Committee on Blood Products, Pharmaceutical Affairs and Food Sanitation Council.

To Health Care Professionals at Medical Institutions

JRCS performs safety measures to prevent TTBI, including emphasis on and reinforcement of prospective donor interviews, skin disinfection of the venipuncture site, diversion of the initial blood flow, pre-storage leukocyte reduction, visual inspection of the blood components, as well as setting a shelf life for platelet components that is shorter than in other countries. However, complete elimination of bacterial contamination in the blood bags is difficult, and it is thus very important that medical institutions check the appearance of blood components before transfusion and to follow up on the patient's condition after starting transfusion.

After delivery

If platelet components are contaminated with bacteria, the bacteria may grow more easily than in other blood components because the storage temperature of platelet components is 20°C to 24°C. **Please use platelet components as soon as possible after delivery.**

Before transfusion

The appearance of platelet components that are contaminated with bacteria sometimes changes over time due to bacterial growth. **Check platelet components for any visible abnormalities before transfusion. When there are any visible abnormalities, do not use the components** and contact a medical representative of the Red Cross Blood Center. Note that some types of bacteria do not cause visible abnormalities in platelet components.

During transfusion

During the transfusion of platelet components, monitor the recipient's condition. **If symptoms that suggest TTBI* occur, immediately discontinue the transfusion and test the recipient's blood with blood culture testing, and then administer antibiotics**. Such symptoms include chills or shivering, severe pyrexia, blood pressure fluctuation, dyspnea, tachycardia and gastrointestinal symptoms. When performing bacterial culture tests on residual bags at medical institutions, collect blood samples under aseptic conditions.

After transfusion

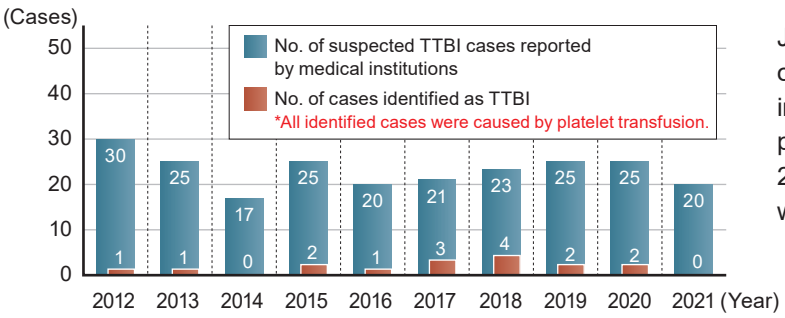
Since some patients present with symptoms of bacterial infection and are found to have bacterial infection after the transfusion is completed, the recipient's condition should be monitored even after the transfusion. **Store residual blood bags after transfusion as much as possible according to the "Guidelines for Lookback Studies of Blood Products."** When bacterial infection is suspected, please provide the residual bag for investigation of the causes.

Storage of residual blood bags

Tighten the clamp of the transfusion set and return it to the transfusion department. Then, seal the top and bottom of the drip tube with a tube sealer (or, properly ligate with a forcep if a tube sealer is not available), put the bag in a plastic bag, and store it in a clean, refrigerated (not freezing) environment.

*For clinical symptoms of suspected TTBI, refer to "Transfusion Information 1812-165" (https://www.jrc.or.jp/mr/news/pdf/yuketsuj_1812_165.pdf).

Changes in the number of suspected TTBI cases during the last 10 years (2012 to 2021)



JRCS supplies approximately 800,000 units of platelet components annually. Since the introduction of initial blood flow diversion and pre-storage leukocyte reduction (in 2007), 21 cases of TTBI have been identified, all of which were caused by platelet transfusion.

Transfusion Information 2212-178

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