

# Post-Transfusion Purpura

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**Abstract:** Post-transfusion purpura is a complication of blood product transfusion in which the recipient produces antiplatelet antibodies resulting in severe thrombocytopenia. The typical patient is a multiparous woman who develops sudden severe purpura 1 week after receiving a transfusion of packed red cells or whole blood. Post-transfusion purpura should, however, be considered in any patient with thrombocytopenia following infusion of a blood product. Untreated, the disease can be fatal or cause serious morbidity. Treatment options include plasmapheresis, intravenous immunoglobulin, and corticosteroids. Platelet transfusion is usually unsuccessful. (*J Am Board Fam Pract* 1991; 4:175-8.)

Post-transfusion purpura (PTP) is a disorder of hemostasis in which severe thrombocytopenia develops after transfusion of blood products.<sup>1,2</sup> As knowledge about antiplatelet antibodies continues to increase, cases of PTP are recognized more often. It is important for clinicians to differentiate PTP from other causes of thrombocytopenia because specific therapy exists. Platelet transfusion is rarely helpful and can prolong the thrombocytopenia.

## Case Report

A 22-year-old woman was admitted to our hospital because of vaginal bleeding at 14 weeks' gestation. She had been well until 1 week prior to her admission, when she noted vaginal spotting without cramping, fever, or discharge. On the morning of her admission she awoke with worsening bleeding and cramping. At that time, she called the emergency medical service, and when attendants arrived, her systolic blood pressure was 90 mmHg. She received fluid resuscitation and was transferred to the hospital.

The patient said she had not experienced any abdominal trauma or inserted any instruments to induce fetal abortion. Although she had used intranasal cocaine daily for several years, she denied any use of the drug during the preceding month. She had no risk factors for human immunodeficiency virus (HIV) infection. She had chronic anemia but had no family history of bleeding disorders. She had had two children previously, both of

whom were delivered vaginally. The first birth was complicated by a postpartum hemorrhage immediately after delivery, necessitating transfusion of 6 units of whole blood. At that time she had a mild transfusion reaction consisting of fever and chills.

When she was examined at the hospital, her pulse was 96 beats per minute and her blood pressure was 110/70 mmHg. Her uterus was nontender and consistent with a 14-week intrauterine pregnancy. Laboratory studies on admission disclosed her hematocrit to be 0.32 (32 percent), and her platelet count was  $227 \times 10^9/L$  ( $227 \times 10^3/mm^3$ ). A sonogram confirmed a 14-week intrauterine pregnancy with fetal death secondary to placental abruption. She was treated with suction dilatation and curettage. Following the procedure, she continued to bleed heavily, and her hematocrit fell to 0.26 (26 percent). At that time she was thought to have either a uterine perforation or retained products of conception. Because of these concerns, she was given 2 units of whole blood. Following this transfusion, however, her vaginal bleeding resolved. No retained products of conception were seen on a repeat sonogram, and her abdominal pain improved.

Nine days after admission, her vaginal bleeding recurred, and petechiae appeared on her chest and arms. Her hematocrit was 0.31 (31 percent) and her platelet count was  $4 \times 10^9/L$  ( $4 \times 10^3/mm^3$ ). Prothrombin time, partial thromboplastin time, thrombin time, fibrin split products, bleeding time, and fibrinogen were all normal. Her peripheral blood smear showed decreased platelets, but there was no evidence of hemolysis. A bone marrow biopsy showed increased megakaryocytes.

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A tentative diagnosis of post-transfusion purpura was made, and she was administered prednisone, 100 mg daily. The following day, her platelet count was unchanged, and antiplatelet alloantibodies were detected in her serum. Intravenous immunoglobulin G, 20 g/d, was begun. Her platelet count rapidly improved, and by the 3rd day was  $68 \times 10^9/L$  ( $68 \times 10^3/mm^3$ ). She then left the hospital against medical advice and was lost to follow-up until 4 months later. At that time, her hematocrit was 0.40 (40 percent), and her platelet count was  $334 \times 10^9/L$  ( $334 \times 10^3/mm^3$ ). The patient's platelets were typed as  $PI^{A1}$  positive (homozygous), and an antibody against the platelet-specific antigen  $PI^{A2}$  was identified in her serum.

### Discussion

Post-transfusion purpura was first described in 1961.<sup>3</sup> Since then, more than 200 cases have been reported.<sup>4</sup> Most patients with PTP have lacked the platelet antigen  $PI^{A1}$ . Because 98 percent of the population has this platelet antigen, it is almost certain that a  $PI^{A1}$ -negative transfusion recipient will receive  $PI^{A1}$ -positive blood. PTP has been reported after infusions of whole blood, packed cells, or platelets<sup>5,6</sup> and was even noted in a  $PI^{A1}$ -positive patient following transfusion of  $PI^{A1}$  antibody from a sensitized donor's plasma.<sup>7</sup> Recurrences of PTP have occurred.<sup>8</sup>

Most patients with PTP have been women older than 40 years who have a history of pregnancy or previous blood transfusion. Fever and chills often accompany this initial transfusion, as seen in our patient. Exposure to nonautologous blood stimulates the patient's immune system to make platelet alloantibodies, which are gradually lost. A later transfusion produces an anamnestic antibody recall that peaks within 5 to 10 days and produces a precipitous drop in the patient's own platelets to counts below  $10 \times 10^9/L$  ( $10 \times 10^3/mm^3$ ). The condition is identified by the sudden appearance of purpura, hematemesis, hematochezia, hematuria, or excessive wound or vaginal bleeding. The mean duration of thrombocytopenia is 4 weeks, but it can last up to 5 months.<sup>9</sup>

Although clinically well characterized, the exact mechanism of PTP remains unsettled. Several theories have been proposed, including the formation of immune complexes leading to plate-

let lysis, the production of a platelet-binding alloantibody stimulated by a transfused antigen, and the creation of an autoantibody as part of a generalized immune response to the transfused foreign antigens.<sup>2</sup>

Occasionally, other platelet antigens cause PTP. There have been fewer than five reported cases of PTP involving antibodies to the platelet-specific alloantigen  $PI^{A2}$ . This patient was unusual because she was  $PI^{A1}$  positive but  $PI^{A2}$  negative and formed an antibody to  $PI^{A2}$ .

It is not known why PTP is so uncommon. Because at least 2 percent of the population lacks the platelet antigen  $PI^{A1}$ , one would expect PTP to occur more often in transfusion recipients who have been previously sensitized. It is speculated that a particular human leukocyte antigen predisposes some patients to this malady.<sup>10</sup>

The diagnosis of PTP depends on eliminating other causes of purpura. The evaluation should include clotting studies to rule out disseminated intravascular coagulation and an examination of the peripheral blood smear to exclude thrombotic thrombocytopenic purpura. The patient should be questioned about illicit drug use and possible exposure to HIV, because thrombocytopenia is associated with both narcotic abuse and acquired immunodeficiency syndrome.<sup>11,12</sup> Because almost any drug can cause thrombocytopenia, all non-essential medications should be discontinued. A bone marrow biopsy is necessary to exclude disorders of platelet production. The presence of platelet-specific alloantibodies following a recent transfusion in a patient who was previously exposed to platelet antigens (through pregnancy or transfusion) confirms the diagnosis of PTP.

Although untreated PTP gradually resolves over 4 weeks, there is a 10 percent mortality rate. Several treatments have been tried, including high-dose corticosteroids, transfusion of  $PI^{A1}$ -negative platelets, plasma exchange, plasmapheresis, and intravenous immunoglobulin. The latter two, having shown the most successes, are considered treatments of choice. Platelet transfusions are rarely effective because they are destroyed by the same antiplatelet antibodies that have caused the patient's thrombocytopenia.

### Summary

Post-transfusion purpura usually occurs in multiparous women older than 40 years who

develop sudden severe purpura 1 week after receiving a transfusion of packed red cells or whole blood. PTP should, however, be considered in any patient with thrombocytopenia following infusion of a blood product. Untreated, the disease can be fatal or cause serious morbidity. Treatment options include plasmapheresis, intravenous immunoglobulin, and corticosteroids. Platelet transfusion is usually unsuccessful. Patients who have had PTP should wear medical alert bracelets and be advised that future transfusions can cause a recurrence unless given washed cells or platelet type-specific blood.

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