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Adverse Ocular Reactions Following Transfusions — United States, 1997–1998

On December 23, 1997, the Portland region of the American Red Cross (ARC) notified the Oregon Health Division about a cluster of adverse ocular reactions among six patients who had received out-patient red blood cell (RBC) transfusions at a hospital in Washington; all patients experienced severe bilateral conjunctival erythema within 24 hours of transfusion. Since the initial report, 106 similar reactions in 74 patients in 14 states (Alabama, California, Connecticut, Maine, Michigan, Minnesota, Montana, Oklahoma, Oregon, Pennsylvania, Texas, Utah, Washington, and Wisconsin) have been identified. This report summarizes the preliminary findings from three of these states about the ongoing investigation of these reactions.

From November 15, 1997, through January 7, 1998, a total of 49 adverse ocular reactions were reported in 38 patients in Michigan, Oregon, and Washington. An adverse ocular reaction was defined as bilateral eye redness occurring after November 1, 1997, and within 24 hours of receiving a RBC product. Median age of patients was 59 years (range: 28–84 years), and 22 (58%) were male; all had an underlying oncologic or hematologic diagnosis. Median time from transfusion initiation to symptom onset was 20 hours (range: 1–24 hours). Reactions were characterized by severe conjunctival erythema and/or conjunctival hemorrhage (100%), eye pain (62%), headache (25%), periorbital edema (23%), arthralgias (19%), nausea (15%), dyspnea (6%), and rash (6%). Median time from symptom onset to resolution was 5 days (range: 2–21 days); two patients remained symptomatic at the time of the interview. All patients had received transfusions of leukocyte-reduced RBCs within 24 hours of symptom onset; four also had received platelets. For 45 of 46 patients for whom information was available, the patient had received at least one unit of blood filtered with the LeukoNet Prestorage Leukoreduction Filtration System (HemaSure Inc., Marlborough, Massachusetts)*, one of several prestorage leukocyte-reducing methods used by ARC. In three reactions, patients also received blood filtered with another leukocyte-reducing prestorage method.

Because all initial reports of reactions were linked to specific lots of LeukoNet-filtered blood products, on December 31, 1997, ARC issued a nationwide voluntary

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quarantine of seven lots. On January 7, 1998, ARC expanded this nationwide quarantine to all LeukoNet-filtered blood products produced since October 1, 1997. No additional adverse reactions have been reported among persons who received transfusions since January 8, 1998. CDC, in collaboration with state health departments, the Food and Drug Administration (FDA), and ARC, is conducting an investigation to determine the source and extent of these reactions.

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Editorial Note: Short-term adverse transfusion events may be febrile, nonhemolytic transfusion reactions or hemolytic (i.e., RBC destruction by either immune or nonimmune mechanisms). Allergic transfusion reactions also can occur and range in clinical severity from minor urticarial reactions to anaphylaxis; such events usually occur during or soon after transfusion (*1*).

The most frequent use of leukocyte-reduced blood is to minimize the likelihood of febrile, nonhemolytic transfusion reactions, particularly in persons with underlying hematologic malignancies (*1*). Leukocyte reduction also has been used to reduce alloimmunization and transfusion-transmitted infections (*2*).

Leukocytes can be reduced from blood 1) immediately after collection by using a filter that is integral to the collection system (in-line filtration); 2) after collection through use of a filter that must be attached to the collection bag; and 3) immediately at or before transfusion. The first two methods are referred to as "pre-storage" filtration, and maximize leukocyte adherence and minimize cytokine release.

The underlying mechanism for the cluster of adverse reactions described in this report has not been determined. However, potential causes include a toxic reaction to a chemical or material used in the production of the blood-collection system, or an allergic response to an unidentified allergen in the collection-filtration system (*3,4*). To assist the ongoing investigation and to determine the source, mechanisms, and potential magnitude of these reactions, clinicians and blood bank personnel should report cases of post-transfusion adverse ocular reactions through state health departments to CDC's Hospital Infections Program, National Center for Infectious Diseases, telephone (404) 639-6413 and to FDA's MedWatch Program, telephone (800) 332-1088.

References

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