Three Cases of Blood Transfusion Malaria in Riyadh City, 2000.

This report is of the development of malaria in three Saudi neonates after receiving blood products during their admission into a nursery of a major hospital in Riyadh, which is a city known to be free of malaria. We conducted an epidemiological investigation to identify the type of nosocomial malaria, its cause, and to suggest a practical approach to prevent similar incidents in the future.

The medical files of all three cases were reviewed, along with the records of all blood or blood products administered. Medical interventions done while the cases were in hospital were reviewed, including heparin preparation and administration, and intravenous device procedures. All donors of the blood units used were interviewed and questioned about recent travel to malarious areas. Mothers of the infants were questioned about travel to malarious areas, symptoms and signs of malaria, and antenatal history. Screening procedures at the blood bank, and other reports of transfusion malaria from the same city were also reviewed.

The first case was a 2-month old, preterm Saudi female, born at 35 weeks, with a birth weight of 1.7 Kg. She remained in hospital for 23 days and was discharged with a weight of 2.0 Kg. After that, she was admitted to another hospital complaining of cough, fever and shortness of breath, where she stayed for 10 days and received IV medication and one Unit of packed red blood cells (PRBC), and was discharged one week later in good general health. Two weeks after that, she developed fever and was brought again to hospital where a blood film for malaria turned out positive for Plasmodium vivax. Inquiry on the blood donor revealed that he came from a malarious area, but had not traveled in the previous 6 months.

The second case was a full term baby, admitted at 19 days of age due to pallor and poor feeding. Investigations showed the infant to have congenital heart disease, specific IGM antibody for cytomegalovirus, and pancytopenia. She received repeated blood transfusions, a total of 38 units (6 of PRBCs, 24 of fresh frozen plasma FFP, and 8 of platelet concentrate). The patient was discharged from hospital in good general condition but was readmitted again due to fever and poor feeding of one-week duration. The blood film showed heavy parasitemia for Plasmodium falciparum. Inquiry on the blood donors revealed that 4 of the 38 came from malarious areas, and all had history of travel to their home areas within 6 months prior to blood donation.

The third case was a newborn preterm Saudi boy, admitted to NICU directly from the labor room complaining of anemia and shortness of breath. He received 64 transfusions (25 of FFP, 15 of PRBCs and 24 of platelet concentrate). Three weeks later, he developed a spike of fever. Blood smear showed heavy parasitemia for Plasmodium falciparum. Inquiry on the blood donors revealed that three of the 64 came from malarious areas in their countries and all had traveled to their home areas within 6 months prior to blood donation.

All three cases had not traveled to malarious areas and had no family history of malaria. Mothers' blood smears were negative, and all IV procedures were done according to infection control practices. All three cases had developed fever a few weeks after receiving blood products from donors who came from or had recent history of travel to malarious areas. The possibilities of congenital malaria and malpractice were excluded, and the most appropriate diagnosis was transfusion malaria.

– Reported by: Dr. Ahmed Al Sehli, Dr. Adel Fatani, Dr. AbdulAziz Al Mazam, Dr. Adel Turkistani (Field Epidemiology Training Program), Mrs. Shadia Al Sudani, Mrs. Hind Zoman (Riyadh Medical Complex).

Editorial note: Blood transfusion malaria is a significant problem in endemic countries, where the number of incidents depends on the selection of donor and the type of screening test applied.[1]

The standard test for identification of Plasmodium.spp is microscopical examination in Giemsa stained thick and thin blood films, which is a rapid and inexpensive diagnostic test. The major disadvantage of the thick smear is that it is often difficult to read and interpretation of the results requires considerable expertise, particularly at low levels of parasitemia. Furthermore, among donors with Plasmodium falciparum malaria the parasites can be sequestered and are not always present in peripheral blood, and diagnosis may be easily missed. Because of these limitations, serological donor screening should be done using a highly sensitive test to minimize the risk of transfusion malaria.[2,3]

In Saudi Arabia, screening of blood donors is dependent on both a questionnaire, and microscopy of thick and thin blood films. The blood bank questionnaire, however, does not include questions on travel history to malarious areas in the previous 6 months, nor does it inquire on residence in malarious areas in the three years prior to blood donation. These three cases of transfusion malaria may, therefore, have resulted from incomplete screening of blood donors. Blood banks should exclude donors who had traveled to malarious areas during the preceding 6 months or if prophylaxis had been taken in the past 3 years. A more sensitive test to detect low parasitemia, such as immunochromatography, should be used.

References:

1. Rouger P. From malaria to post-transfusional malaria. *Transfus Clin Biol* 1999; 6 (1): 72-4.
2. Espinnol CA, De Morales PO. Indirect Elisa Test For malaria in Blood Donors. *Trans R Soc Trop Med Hyg* 1984; 78(5): 645-7.
3. Marlies HC, Brian LS. Comparative evaluation of four techniques for the diagnosis of Plasmodium falciparum infections. *Trans R Soc Trop Med Hyg* 1997; 91: 279-282.