Plasmodium ovale malaria in Canada following transfusion

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Transfusion-induced malaria is uncommon in Western countries, although 2001 cases were collected recently from the world literature.[1] Only 7 cases have occurred in the United Kingdom since 1936[2] and only 48 cases in the United States since 1957;[3] no cases have been reported in Canada.

Of the organisms causing transfusion-induced malaria, *Plasmodium ovale* is the least common, having been responsible for only two cases so far.[1] We report the third case of transfusion-induced malaria due to *P. ovale* — the first case of transfusion-induced malaria in Canada.

Case report

A 60-year-old woman received 15 units of blood following total hip arthroplasty. On the 29th postoperative day she had a fever of 39°C associated with chills and rigors. The fever recurred a week later and every 2 to 3 days thereafter until a diagnosis of malaria was made on the 58th postoperative day. The interval between fevers was never constant and the liver and spleen did not become enlarged. The serum bilirubin concentration increased to 2.7 mg/dL on day 43 but was generally less than 2.0 mg/dL. The hemoglobin value fluctuated between 10 and 12 g/dL.

Since the patient had never travelled outside Alberta, malaria was not considered. It was not until examination of a peripheral blood film and bone marrow aspiration were ordered to investigate her chronic anemia and fever of unknown origin that the correct diagnosis became apparent. Malarial parasites were detected easily in the peripheral blood and bone marrow smears (Fig. 1). The parasitized erythrocytes were oval and larger than nonparasitized cells, and many had a fimbriated margin; the parasites were identified as *P. ovale*.

Treatment with chloroquine and primaquine resulted in complete clinical recovery and allowed her to begin a program of hip rehabilitation.

Discussion

Since the most likely source of the malaria in our patient was transfused blood, the 15 donors involved were contacted. Two had travelled to areas where malaria was endemic, one of them (donor X) 2 years earlier and the other (donor Y) 30 years earlier. Neither had ever had clinical malaria and both had normal peripheral blood smears. Serum from our patient and the two suspect donors was sent to the Center for Disease Control in Atlanta, Georgia for indirect fluorescent antibody testing. The serum from the patient and donor X had high titres of antibody to *P. ovale* — 1:1024 and 1:256, respectively — and showed crossreactivity to *P. vivax* with titres of 1:64, but there were no detectable antibodies to *P. falciparum* or *P. malariae*. Donor Y's serum yielded negative results for all four species.

Donor X was a 23-year-old woman who had visited Kenya, Tanzania, Mozambique, Malawi and South Africa from January to July 1973. While travelling she had taken irregularly two unidentified malarial prophylactics. She denied having had clinical malaria but a travelling companion taking one of the same drugs had had three clinical attacks of malaria.

She had made no mention of her visit to Africa when she donated blood Aug. 18, 1975, and this unit was transfused as whole blood 2 days later. The incubation period — the interval from transfusion to the time of the patient's first fever — was 22 days.

In retrospect, treatment of our patient with primaquine was unnecessary since a hepatic cycle is not established in transfusion malaria.[4] The definitive diagnosis of transfusion-induced malaria, however, had not been established at that time. When donor X was identified as the malarial carrier the patient was treated with chloroquine and primaquine.

Tourists to areas where malaria is endemic who have taken malarial prophylactic agents should not be allowed to donate blood for 3 years.[5] These persons often do not complete "prophylaxis" with a drug effective against the hepatic cycle of the parasite and, having acquired some immunity, may sustain an asymptomatic, low-level parasitemia once suppressive prophylaxis is stopped. Presumably this is what happened with donor X. Host defences will usually eradicate the parasites within 3 years except in the case of *P. malariae*, which may persist indefinitely in the blood. *P. ovale* malaria is endemic only in tropical Africa, and although its prevalence is greater on the west coast the endemic area includes all the countries on the east coast visited by donor X.[6]

This case serves as a reminder to physicians in all parts of the world to consider malaria as a cause of unexplained fever in any patient who has received a blood transfusion in the preceding months. It also highlights the need for continued appropriate chemotherapy for tourists upon their return from areas where malaria is endemic.[7]

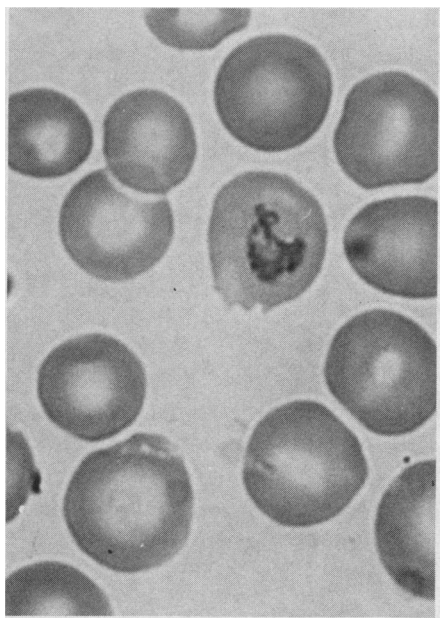

FIG. 1—Parasitized oval erythrocyte with fimbriated margin in peripheral blood (May–Grünwald–Giemsa stain; original magnification ×1200).

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