Transfusion Transmitted Malaria in a Non-Endemic Area

V Chauhan[*], RC Negi[*], B Verma[##], S Thakur[#]

Abstract

Transfusion transmitted malaria in non-endemic areas is a rare and alarming diagnosis. It deserves a special mention because of its rarity, delay in diagnosis, treatment and serious complications. Shimla, though non-endemic, but being a tourist place, can get malaria transported from other parts of India. We present here a case of transfusion transmitted falciparum malaria in IGMC Shimla. We have discussed the strategies for diagnosis and prevention of transfusion transmitted malaria in endemic and non-endemic regions.

Introduction

Transfusion induced malaria was first reported in 1911, but still no definite measures have ruled out its transmission through blood transfusion, especially in endemic areas. Transfusion malaria is particularly common in countries where blood donation has become a commercial transaction and where the blood donors come from less affluent social class and India is one of them. IGMC Shimla, from where this case was reported, is at an altitude (2130 meters above sea) where the vector of malaria does not survive. We have reviewed the need for stringent screening criteria for donors and for awareness of this entity among the treating physicians in non-endemic areas.

Case Report

A 47-year-old female underwent vaginal hysterectomy with bilateral salpingo-oophorectomy (BSO) for dysfunctional uterine bleeding (DUB) on 28/10/06 in gynecology department. Patient had received three units of blood transfusion for severe anemia prior to surgery.

On 12th post-operative day, patient developed fever, yellowish discoloration of eyes, nausea, vomiting, pain in right hypochondrium, and generalized aches. Patient was treated for possible septicemia but fever persisted despite antibiotic treatment.

Patient was shifted to medicine department for further workup. The patient developed features of severe falciparum malaria in the form of altered sensorium, retinal hemorrhages, two episodes of generalized tonic-clonic seizures and jaundice. Serology for hepatitis B, E, C and A was normal. Blood and urine cultures were normal. Widal and Weil Felix were negative. Ultrasound was normal. Patient's hemoglobin fell to 6 gm%, total leukocyte count was 6700/mm^3, ESR was 40 mm in 1st hr, and random blood sugar was 101 mg%. Total bilirubin was 8.5 mg%, conjugated was 5.2 mg%, SGOT/SGPT were 120/131 IU/L, and the urea/creatinine were 40/1.1 mg%.

Transfusion related infection was suspected and patient was evaluated for the same. The peripheral smear revealed multiple ring forms in red blood cells, double chromatin dots, and male and female gametocytes of Plasmodium falciparum. History was reviewed, but there was no history of travel to malarious zones or past history of malaria. From the donor records, one of the donors was from the malarious zone, but he could not be contacted for investigative workup.

[*]Senior Resident, [##]Assistant Professor, [#]Professor, Department of Medicine, Indira Gandhi Medical College, Shimla 171001, Himachal Pradesh
Received: 24.11.2008; Accepted: 02.03.2009

The diagnosis of transfusion transmitted malaria was made. The patient was started on injection quinine and i.v. fluids. After bolus dose of quinine 20mg/kg, patient developed features of cinchonism and visual disturbance. Injection quinine was stopped and injection artesunate was given for five days and then oral for next 3 days. Patient became afebrile and was discharged with a diagnosis of transfusion transmitted severe falciparum malaria, post-op vaginal hysterectomy with BSO.

Discussion

Transfusion transmitted malaria is one of the dreaded threats to the safety of transfusion services in this malaria endemic world. This may result in significant morbidity and mortality in transfusion recipients.

Transfusion transmitted malaria is a unique entity, caused by injection of asexual forms (trophozoites). Malaria can also be transmitted in drug addicts through the use of same syringe and congenital malaria infection in utero through some placental defect. Trophozoite-induced malaria differs from natural infection in the form that pre- erythrocytic schizogony is absent, incubation period is shorter, exo-erythrocytic schizogony is not seen, relapses do not occur, and radical cure is possible.

A recent International Forum showed that in Europe, as well as the USA, prevention of transfusion-associated protozoal infections depend mainly on selection of donors using questionnaires. A donor is rejected for 3 years after their last visit to the endemic area. Persons from non-endemic areas, who visited the malaria endemic area, are rejected for 4-12 months. Some countries reject these donors for 3 years or permanently when they have resided for more than 6 months in the endemic area.[1] Over the last decade only a few cases of transfusion transmitted malaria were reported in various countries.[1]

The donor-exclusion criteria have a scientific basis. The guidelines aim to strike a balance between minimizing the risk of malaria and excluding as few uninfected donors as possible. Infections with species that cause relapsing illness (P. vivax and P. ovale) rarely persist longer than three years.[2] Infections with P. falciparum rarely persist longer than one or two years.[3] P. malariae parasites can persist for decades[4] and rare cases of transfusion-transmitted malaria may continue to occur despite the use of current exclusion guidelines.

The main drawback in prevention through transfusion is that routine donor screening techniques are not very satisfactory. A comparison of antibody detection by ELISA and immunofluorescence assay (IFA) and antigen detection by monoclonal antibody (MAB) showed a total of 19.37% and 12.39% blood donors having significantly high antibody by ELISA and IFA test respectively, and 0.35% donors showed the

presence of antigen by the MAB technique. So antigen detection in blood donors with the help of the MAB technique seems to be more sensitive and a practically feasible screening test to prevent transfusion malaria.[5]

In India though it is mandatory by Drug and Cosmetic Act to screen donated blood for malaria, there are no definite guidelines on the choice of the test. Donors who are implicated as the source of transfusion transmitted malaria cases typically have very low level of parasitemia undetectable even on several thick films.[1] Moreover, traditional blood film microscopy involving large number of blood donor samples needs large manpower and high technical skill. Malaria antibody screening is not indicative of active infection and results in unnecessary high discarding of collected blood units as the antibody may persist up to several years after infection. PCR and antigen detection tests have limited availability. Hence, most of the donated blood across the country is not screened for malaria. On the other hand, malaria immunoprophylaxis to all blood recipients is also not feasible practically. Reports on transfusion transmitted malaria from India are not available as in the absence of awareness; the cases may be attributed to the mosquito-acquired malaria.

Most of the malaria non-endemic countries follow the rule of donor deferral for 3 years after malaria infection. Screening for specific antimalarial antibody provides an effective means of minimizing the risk of transmission. In endemic countries, donor deferral criterion cannot be followed since the majority of the population is continuously exposed to this infection. In endemic countries, more specific donor questioning, consideration of seasonal variation and geographical distribution may help to identify the population of donors who are most likely to be infected. More systematic care needs to be directed towards blood screening. Although, antigen detection by monoclonal antibodies is recommended as a routine screening procedure by blood transfusion services in malaria endemic countries, in countries like India it may not be practical. In addition, the administration of antimalarials to transfusion recipients may help to prevent transmission. Nonetheless, no matter what strategy is adopted, it is likely that cases of transfusion-transmitted malaria may still occur, so malaria must always be considered in any patient with a febrile illness post-transfusion.[6]

References

1. Reesink HW. European strategies against the parasite transfusion risk. Transfus Clin Biol 2005;12:1-4.
2. Miller LH. Transfusion malaria. In: Greenwalt TJ, Jamieson GA, eds. Transmissible disease and blood transfusion. New York: Grune and Stratton, 1975:241-66.
3. Guerrero IC, Weniger BC, Schultz MG. Transfusion malaria in the United States, 1972-1981. Ann Intern Med 1983; 99:221-226.
4. Talib VH, Prakash I. Transfusion malaria. Indian J Pathol Microbiol 1996;39:493-497.
5. Choudhury N, Jolly JG, Mahajan RC et. al. Donor screening for malaria by antibody and antigen detection in endemic area. Indian J Malariol 1991;28:179-82.
6. Kitchen AD, Chiodini PL. Malaria and blood transfusion. Vox Sang 2006;90:77-84.