CASE REPORT

Multidrug Resistant Transfusion Vivax Malaria

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ABSTRACT A 17-day-old premature baby girl had received a blood exchange transfusion because of hyperbilirubinemia and got another blood transfusion because of severe anemia on day 45. The diagnosis of transfusion vivax malaria was made when she had severe anemia again on day 78. The most predominant clinical signs were fever, anemia, hepatosplenomegaly, and thrombocytopenia. Treatment with chloroquine 25 mg base/kg BW showed resistance at RIII level on a 7-day follow up. She was retreated with quinine 10 mg salt/age in month divided in 3 doses/day for 7 days. It also showed resistance at late RI level on day-30. Then she was retreated with quinine 15 mg salt/age in month divided in 3 doses/day for 7 days and still showed resistance at late RI level on day 32. Finally she was treated with quinine 10 mg salt/kg BW/dose, tid for 7 days which was effective. During the course of treatment, no adverse reactions were found clinically. This malaria case was transfusion vivax malaria resistant to choloroquine at R III level and to quinine at late R I level. Quinine 10 mg salt/BW/ dose tid for 7 days was effective and safe for infants. **[Paediatr Indones 1994; 34:175-178]**

Introduction

Indonesia is a tropical country where malaria is still prevalent especially in the eastern part. In Jakarta, many people including the clinicians think that malaria is not more a public health problem.

Accepted for publication: March 31, 1994. Author's address: Emiliana Tjitra, CDRC, Ministry of Health, Jalan Percetakan Negara, Jakarta, Indonesia.

In Jakarta usually malarial cases are imported by people who have travelled to endemic or malarious areas. In this city where people from every part of Indonesia can be found, the possibility of malaria infection in blood donors must always be considered seriously.[1]

The extensive use of blood transfusion in medical practice renders transfusion malaria a problem of clinical and public health importance. WHO requires that all blood donors in malaria endemic

areas should be free from malaria for at least 2 consecutive years.[2] However, the Indonesian Red Cross which is the main source of blood for transfusion does not require malaria laboratory examination for screening of blood donors. Exclusion criteria is based on interview.

Very few transfusion malaria cases were reported in Indonesia.[3-5] This report calls for awareness and attention on induced malaria from the use of unscreened blood for transfusion that may develop into a serious or fatal case.

Case Report

A premature baby girl (weight 1.8 kg) was born in Jakarta on January 17, 1993. Her parents were residents of Jakarta who had never stayed in malarious areas and had had no history of malaria. She was hospitalized for intensive neonatal care for 17 days.

On day 7 she received blood exchange transfusion because of hyperbilirubinemia (serum bilirubin concentration= 21.0 mg/dl). She was discharged in a good condition with a weight of 2.0 kg. When she was 38 days old, her mother realized that she was pale and had a distended abdomen, her body weight increased to 2.7 kg. She was readmitted for 3 days because of severe anemia (hemoglobin=5.0 g/dl) and received 90 ml blood transfusion to increase her hemoglobin to 16.0 g/dl .

At the age of 78 days, she was again admitted to the hospital because of skin rash, severe anemia (Hb=5.0 g/dl), hepatomegaly (8 cm), splenomegaly (Hackett 4 = H4), slight leukocytosis (11 000/µl), and thrombocytopenia (49 000/µl. Her body weight was 3.5 kg. Vivax malaria was diagnosed from the thin blood smear with a parasite density of 1.3%. Another 80 ml blood transfusion was given to increase her hemoglobin level to 10.2 g/dl, WBC and platelet counts were 9 600/µl and 68 000/µl, respectively.

Chloroquine 25 mg base/kg BW was given in 3 doses for 3 days. During the treatment no vomiting was reported but the decrease of parasitemia was less than 75% and the parasite density remained at 0.5 % on day 2 after treatment. No parasite clearance was observed until day 7 and the parasite density remained at 0.9%. According to the WHO standard of in vivo sensitivity test, this *Plasmodium vivax* was resistant to chloroquine at R III level. She was retreated with another antimalaria, i.e., quinine diphosphate with a dose of 10 mg/age in month divided in 3 doses/day for 7 days. On day 6, there was no parasite found, the hemoglobin decreased to 5,5 g/dl, WBC 7100/µl and platelets 86 000 /µl. Her condition improved with the values of hemoglobin, WBC and platelet 11.4 g/dl, 8 300/µl, and 120 000/µl, respectively. On a week follow-up no parasitemia was found for 1 month.

One month after quinine treatment, she developed fever. The hemoglobin, WBC and platelet were 8.1 g/dl, 10 800 /µl and 124 000/µl respectively. *P. vivax* was found at 1,6% density in the thin blood smear. It means that *P. vivax* was resistant to quinine at R I level. Quinine treatment with a higher dose: 15 mg salt /age in month divided in 3 doses/day was given for 7 days. The parasite vanished on day 4 with hemoglobin, WBC and platelets of 6.1 g/dl, 6500/µl, and 123 000/µl respectively. The parasitological follow-up was also done on a weekly basis. Thirty two days after the second quinine treatment, she developed fever again and *P. vivax* was found at a 0.5% density. It was also resistant at the late RI level. The hemoglobin, leukocyte and platelet values were 9.2 g/dl, 3400/ µl and 129 000/µl respectively. Quinine 10 mg salt/kgBW/dose was given three times a day for 7 days[6,7] and the parasite vanished on day 2. On weekly follow-up for 2 months the blood smear remained negative.

Discussion

Malaria induced by blood transfusion from asymptomatic donors is a problem in Indonesia. Preliminary screening by doing blood smear or serological test or other tests cannot be applied because of lack of trained technicians and funds. For the time being, it is important to pay attention and be aware of induced malaria by blood transfusion. Clinicians should have sufficient knowledge on the principles of malaria diagnosis and its treatment.

In Indonesia the most prevalent malarias are falciparum and vivax malaria. In this case we found vivax malaria after blood exchange transfusion. This could happen because vivax malaria can be succesfully transmitted to man with only 10 parasites.[8]

The incubation period of blood induced infection depends on the number of parasites innoculated and susceptibility of the recipient. The period between the transfusion and the appearance of symptoms of this vivax malaria is about one month but other authors reported incubation period of less than one month.[4,5] The patient had the common symptoms and signs of malaria, namely fever, anemia, hepatosplenomegaly, slight leucocytosis or sometimes leukopenia and thrombocytopenia.

So far *P. vivax* resistant to chloroquine has been reported from Nias Islands and Irian Jaya.[9,10] In Irian Jaya, *P. vivax* is known as *Chesson strain*.[6] This case look like *Chesson strain P. vivax* infection resistant to chloroquine at R III level. It was not possible for us to trace the blood donor.

The other antimalarial drug available in Indonesia for chloroquine resistant *P. vivax* is quinine. Quinine is known to be active in asexual erythrocytic stages of all four human malaria parasites but responds less rapidly against *P. vivax* infections. The commonly recommended quinine dose for infants is 10 mg salt/ age in month divided in 3 doses/day for 7 days.[7] To get parasite clearance, we increased the quinine dose according to WHO recommendation[6] and the calculation of dosages of antimalarial drugs for children.[12] This regimen was sensitive and safe for this case.

In *P. vivax* infection, relapse occurs as result of maturation of hypnozoites in the liver with liberation of merozoites into the blood stream. The merozoites then enter erythrocytes after relatively short or long periods[6] Theoritically, there is no exoerythrocytic cycle in transfusion malaria[13] and there is no true relapses.[14] The appearance of parasites was due to multidrug resistance.

In summary, the reported malaria case was a transfusion vivax malaria which was resistant to chloroquine at R III level and to quinine at late R I. The patient was cured effectively with quinine 10 mg salt/kgBW/dose three times a day for 7 days with no side effects.

Acknowledgments

We thank Mrs Tanamas, the mother of the baby case, for her cooperation and her permission to publish this report. We also thank Dr. Arbani for his comments.

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