Curr Pediatr Res 2012; 16 (2): 175-177 ISSN 0971-9032
Scientific Publishers of India

Transfusion-Acquired *Plasmodium falciparum* Infection in a Premature Infant. A Case Report.

Saleh M. Al-Qahtani; Ayed A. Shati; Ali M. Alsuheel; Ahmad A. Al-Hanshani

Department of Child Health(1), College of Medicine, King Khalid University, Abha City, KSA.

Abstract

The transmission of malaria by blood transfusion was one of the first recorded incidents of transfusion-transmitted infection. Although a number of different infections have been reported to be transmitted by transfusion since then, on a global scale malaria remains one of the most common transfusion-transmitted infections. In this case, a male Saudi pre-term infant was found to have blood transfusion-transmitted malaria.

Keywords: Plasmodium Falciparum Malaria, Blood transfusion, Preterm, Aseer region

Accepted May 06 2012

Introduction

In the last few years, the cases of malaria in Aseer region (Southern Saudi Arabia) decreased rapidly and routine screening of blood for malaria for febile patients was stopped. Because of this, clinicians depend on their clinical sense in requesting malaria screening. In our case who started spiking fever in NICU, diagnosis of malaria is a real challenge and any delay in diagnosis, has a relatively high fatality rate. It is clear that transfusion-transmitted diseases will remain one of the most serious blood transfusion complications. The decision to transfuse a patient with blood, should be taken individually and should follow the guidelines of blood transfusion to minimize complications.

Case Report

A male Saudi pre-term infant was referred to our hospital because of failure of extubation at age of 50 days. He was born at 28 weeks of gestational age in a peripheral hospital, with birth weight of 1.0 KG. The baby was delivered by lower segment Cesarian section because of placenta previa which was complicated by bleeding. The baby was intubated immediately and ventilated. Because of failure of extubation the baby was referred to us.

On arrival to our hospital, the baby was stable on mechanical ventilator, and his weight was 850 grams. The baby was extubated two weeks later. His 1st blood culture grew candida which was treated with amphotricin B. All head and abdomen ultrasound and eye exam were normal. At age of 109 days the weight of the baby was 1380 grams and was on full feeding. But he started to spike high temperature reaching 38.5C.

On examination the baby was active. His blood pressure was 75/45 mm Hg (mean 50), heart rate 143-163 beats /min and respiratory rate 45-58/min. He was active and moving all limbs. His systemic examination was unremarkable. His investigations were as follows:

All renal and liver functions were normal. Full sepsis screening was normal and the baby was started on Intravenous Imepnum and Clindamycin but the fever continued. Because our area in known endemic area for malaria, blood film for malaria was done and it was positive for *P. falciparum.*

Immediately after the positive blood film for malaria, Intravenous Quinine and Intravenous Clindamycin were started (Artesunate was not available). The fever subsided after 2 days of therapy. The malaria blood film was done on day 3 and the parasite was hardly seen. On day 5, there was no parasite seen in the smear. Complete blood count-(CBC) after therapy is shown in the table above.

It showed good improvement in the blood indices shortly after the start of treatment. The anti-malaria treatment continued for 7 days and the smear was done at the end of treatment just to be sure about the negativity of the smear and it was negative. The baby spent one month after that in the hospital and was discharged in a good health.

Table 1. *Blood count*

Diagnosis	WBC (x10^3/L)	Hb (g/dL)	PLT (x10^3/L)
3 days before	5.39	9.5	41
2 days Before	4.94	8.7	74
Complete Blood Counts from Day 1 of Diagnosis			
Day 1	3.1	10.3	55
Day 3	10	7.9	111
Day 5	11.9	7.9	159
Day 7	9.6	8.7	246

Discussion

The transmission of malaria by blood transfusion was one of the first recorded incidents of transfusion-transmitted infection. Although a number of different infections have been reported to be transmitted by transfusion since then, on a global scale malaria remains one of the most common transfusion-transmitted infections. Despite that, transfusion-transmitted malaria accounts for small percentage of malaria cases, it can have serious consequences, as infection with Plasmodium falciparum may prove rapidly fatal [1]. The first cases of transfusion-acquired malaria was reported by Gerhardt in 1884 in USA [2].

Among the cases reported for malaria in the USA, only 0.2-0.3% were due to transfusion acquired malaria [2]. In neonates and preterm infants transfusion acquired malaria is more unusual. In 1983, D.A. PICCOLI reported 2 cases of transfusion-acquired *Plasmodium malariae* Infection in two premature Infants [2]. In 1984, Ira A. Shulman reported 2 cases of neonatal malaria one was infected by *P. vivax* and the other by *P. malariae* [3]. The southwestern region of Saudi Arabia (Aseer and Jazan areas) is endemic for malaria. Al.Arishi reported a case of peterm infant with *P. falciparum* and he mentioned that 5 cases of neonatal malaria were reported in the Kingdom of Saudi Arabia. His report focused on the emerging chloroquine-resistant *P. falciparum* malaria in the Kingdom [4]. Saudi Arabia took the decision in 2004 to eliminate malaria nationwide. The impact of this decision is clear. The number of autochthonous malaria cases in Saudi Arabia dropped from 36139 in 1998 to just 29 in 2010, with 4657 and 1912 imported cases in 1998 and 2010 respectively. In 2010, all locally-acquired infections were due to *P. falciparum*. Most of the imported malaria cases in Saudi Arabia are detected by the border malaria units [5].

This low birth weight pre-term infant, after long period of stability, manifested with fever while still in NICU. Hence the 1st diagnosis to be considered is hospital acquired infection. After full sepsis screening, broad spectrum antibiotics were started. But over 3 days, the baby continued to spike fever with the same pattern as before. At the end of 3rd day all the sepsis screening work up was normal. During the discussion of the baby condition, the possibility of malaria was raised especially that the baby had been transfused blood 6 times in our NICU and even in the referring hospital. Blood sample was sent to the lab to look for malaria and it was positive for *P. falciparum* with parasitic index of 3.9%. Because the baby received multiple blood transfusions on different occasions, the donor of the malaria-contaminated blood could not be traced. Upon reviewing the maternal history, it was found that the mother was not sick during the last month of delivery nor febrile. There was no maternal history of malaria.

The preterm infants in NICUs are more prone to such complications because of their deficient immune system and their need to be transfused at one stage of their stay in NICU. In endemic areas, the possibility of malaria infections should be considered in neonates and preterm infants who spike fever or manifested with sepsis especially with history of blood transfusion. However, in non-endemic areas or in areas with low rates of malarial infection, diagnosis of malaria needs high index of suspicion.

Great effort being done in all the blood banks for screening the donated blood for infection. In non-endemic countries, donor deferral can be effective, but

clear guidelines are needed. In endemic countries the problem is far greater as the majority of donors may be potentially infected with malaria parasites. In both situations, the simple deferral of donors may be wasteful and can eventually erode the donor base. Thus, other strategies are needed to ensure safety with sufficiency. However, the screening of donations for evidence of malaria is not without its problems. Although the examination of blood films is still the basis for diagnosing acute malaria, in most situations it is not sufficiently sensitive for blood bank screening. In non-endemic countries, donor deferral in combination with screening for specific antimalarial immunoglobulin provides an effective means of minimizing the risk of transmission. 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 [1]. Saeed et al. concluded that, in malaria endemic countries like Saudi Arabia, excluding antibody-positive donations would result in too much wastage of blood units. However, antigen malaria testing appears to offer a potential utility, as only few donations would be rejected. Antigen malaria testing is current way of screening the blood donations in our area [6].

In addition to transfusion-induced malaria, congenital malaria should also be considered in neonates or infants with malaria. This can be evaluated by examining the mother's blood with both thick and thin smears for parasites. Other potential causes of malaria in neonates or infants include mosquito-transmitted malaria, and the possibility of exposure to malaria via an accidental injection (i.e. needle puncture).

Several diseases can be transmitted to infants via transfusion. The risk of acquiring an infection via transfusion is greatly increased in sick premature infants because they receive frequent transfusions. Physicians caring for sick premature babies should consider transfusion-acquired malaria as a possible cause of illness, especially when there is no response to antibacterial therapy. Prompt and proper antimalarial treatment, especially in case of *P. falciparum* can improve the outcome and decreases complications dramatically.

References

1. Kitchen AD, Chiodini PL Vox Sang. Malaria and blood transfusion. 2006; 90 (2):77-84.
2. Piccoli A, Perlman S, Ephros M. Transfusion-Acquired Plasmodium malariae infection in Two Premature Infants. Pediatrics 1983; 72 (4): 560-562.
3. Shulman I, Saxena S, Nelson J and Furmanski M. Neonatal exchange transfusions complicated by Transfusion-Induced Malaria. Pediatrics 1984; 73; 330-332.
4. Al Arishi H, Al Hifzi I, Ishag Y. Chloroquine-resistant plasmodium falciparum malaria in an extremely premature infant. Ann Saudi Med 1999; 19 (3): 245-247.
5. WHO, Malaria report 2011. http://www.who.int/malaria/world_malaria_report_2011/WMR2011_countryprofiles_lowres.pdf
6. Saeed AA, Al Rasheed AM, Al Nasser I, Al Onaizi M, Al Kahtani S. Malaria screening of blood donors in Saudi Arabia. Ann Saudi Med 2002; 22 (5-6):329-332.

Correspondence to:

Saleh Al-Qahtani
Department of Child Health
College of Medicine
King Khalid University
Abha, Kingdom of Saudi Arabia