CASE REPORT

Bilateral subhyaloid haemorrhage in a conscious patient: a new spectrum of ocular involvement by *Plasmodium falciparum*

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SUMMARY

A 24-year-old woman presented with a history of high-grade fever with rigours since 3 days and bilateral sudden loss of vision since 6 h. She was conscious, oriented and her vitals were stable. She had a temperature of 101°F, anaemia, thrombocytopenia, normal white cell count and moderate splenomegaly. On testing visual activity, she could only perceive hand movements although her pupils were bilaterally equal, and normal in size and reaction. On indirect ophthalmoscopy, optic discs were normal bilaterally; however, fovea of both eyes was masked by subhyaloid haemorrhage. Peripheral smear showed gametocytes of *Plasmodium falciparum*. The patient was started on artemisinin-combined therapy and advised to be in propped-up position to help resolution of the haemorrhage. The patient was afebrile in 4 days and follow-up fundus examination showed gradual resolution of the haemorrhage. After two months, the patient regained normal visual acuity in both eyes; however, it took nearly 3 months for complete resolution of the haemorrhage.

BACKGROUND

Plasmodium falciparum malaria has a diverse range of complications. Most of the ocular involvement in *P. falciparum* malaria is usually associated with cerebral malaria. Ocular findings in case of cerebral malaria include retinal whitening, retinal haemorrhage, papilloedema and cotton wool spots.^{1 2} Bilateral and multiple retinal haemorrhages are the most common findings in *P. falciparum* malaria during ophthalmoscopy.^{3 4} Moreover, an increase in number of these haemorrhages indicates the severity of malaria.⁵ Cortical blindness as a sequela of cerebral malaria is much reported in literature.^{6–8} It has also been suggested that features of malarial retinopathy may be used in the diagnosis of cerebral malaria.⁹ Retrobulbar neuritis has also been reported in *P. falciparum*-affected patients.⁷ Subhyaloid haemorrhages are reported in cerebral malaria in children.^{10–12} They have also been reported in adults with cerebral malaria due to idiosyncratic reaction to quinine.^{12 13} We report a case of *P. falciparum* malaria causing subhyaloid haemorrhage without cerebral involvement.

CASE PRESENTATION

A 24-year-old woman presented to us in the medicine outpatient clinic with a history of high-grade

fever with rigours since 3 days and bilateral sudden loss of vision since 6 h. She had no history of any medication for these symptoms. She was conscious, oriented and her vitals were stable. She was febrile and pallor was present. On per abdominal examination, moderate splenomegaly was present. On testing visual activity, she could only perceive hand movements although her pupils were bilaterally equal, and normal in size and reaction. On indirect ophthalmoscopy, optic discs were normal bilaterally; however, fovea of both eyes was masked by subhyaloid haemorrhage. This was further confirmed by fundus photography and slit lamp examination (figure 1). Plantar reflex was bilaterally flexor, and there was no focal neurological deficit.

INVESTIGATIONS

Laboratory investigations showed anaemia (haemoglobin 6.6 g/dL, mean corpuscular volume 98 fL, haematocrit 18%), a normal white cell count (5800/mm³) and thrombocytopenia (98×10³ mm³). Urine examination was normal. Liver enzymes were marginally raised and serum bilirubin was 1.8. On peripheral blood smear examination, gametocytes of *P. falciparum* were seen which was further confirmed by quantitative buffy coat analysis. Bleeding time, clotting time and international normalized ratio were in normal range. Ultrasonography of the abdomen showed splenomegaly.

TREATMENT

The patient was started on artemisinin-combined therapy (intravenous artesunate and mefloquine). She was advised to be in propped-up position to help resolution of the haemorrhage.

OUTCOME AND FOLLOW-UP

The patient became afebrile in 4 days and follow-up fundus examination every alternate day showed gradual resolution of the haemorrhage. On the eighth day, the patient's visual acuity was 6/18 in both eyes. The patient was discharged and kept on regular follow-up. After 2 months, the patient regained normal visual acuity of 6/6 in both eyes; however, it took nearly 3 months for complete resolution of the haemorrhage.

DISCUSSION

P. falciparum malaria is known for its dreadful complications. Ocular involvement is often reported

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Figure 1 (A and B) Fundus photograph (right eye) showing preretinal haemorrhage (arrow) overlying macula.

these days in case of cerebral malaria. Antimalarials such as quinine and chloroquine have ocular side effects.¹³ Ocular involvement in cases of cerebral malaria has been attributed to similarity in their microvasculature, both being neuroectodermal in origin.¹² In patients without cerebral involvement, vascular endothelium disintegrates may be the cause. Cytoadherence and rosette formation may lead to vascular occlusion causing hypoxia which ultimately leads to vascular endothelial injury.¹⁴ As small venules mainly contribute to subhyaloid haemorrhage, anaemia may further aggravate the degree of venous dilation and stagnation of blood ultimately leading to haemorrhage.¹³ Another explanation may be thrombocytopaenia causing haemorrhage. Whatever the reason be, in every patient of complicated *P. falciparum* malaria, ocular examination must be performed more thoroughly.

Learning points

- ▶ Ocular involvement can occur in *Plasmodium falciparum* malaria, so this possibility should always be considered.
- ▶ Management of ocular involvement in malaria is primarily conservative.
- ▶ Ocular involvement in malaria usually does not lead to any long-term sequelae.

Contributors All the authors were involved in the evaluation and management of the patient. The manuscript has also been read and approved by all the authors.

Competing interests None.

Patient consent Obtained.

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