

CASE REPORT

Intracerebral bleed, right haemiparesis and seizures: an atypical presentation of *vivax* malariaSuman S Karanth,¹ Krishna Chaitanya Marupudi,¹ Anurag Gupta²¹Department of Internal Medicine, Kasturba Medical College, Manipal, Karnataka, India²Department of Neurosurgery, Fortis Memorial Hospital, Manipal, Karnataka, India**Correspondence to**

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SUMMARY

Falciparum malaria is notoriously known to produce life-threatening complications. Despite growing reports of chloroquine resistance and severe disease, *vivax* malaria continues to be viewed as a benign disease. We report a rare case of a 47-year-old healthy man from a malaria-endemic region, presenting with intracerebral bleed, right haemiparesis, aphasia and seizures following *vivax* malaria. This was successfully managed conservatively, without any neurosurgical intervention, with combination therapy of intravenous artesunate, oral hydroxychloroquine and primaquine. In a country where *Plasmodium vivax* is responsible for majority of cases of malaria, it is high time the national malaria control programmes focus on the elimination of *P. vivax* in addition to its more dangerous counterpart, *P. falciparum*.

BACKGROUND

The burden of severe malaria is most often reported with *falciparum* malaria worldwide. The National Vector Borne Disease Control of India reports 1.06 million cases with half a million cases of *falciparum* malaria. With increasing reports of serious manifestations including severe anaemia, acute respiratory distress syndrome, severe thrombocytopenia¹ and shock,² *vivax* malaria can no longer be viewed as a benign disease. We report a rare case of *vivax* malaria presenting as right haemiparesis and seizures, in the absence of significant thrombocytopenia, with complete recovery following antimalarial therapy.

CASE PRESENTATION

A 47-year-old man, otherwise healthy Indian man, was brought to our emergency department with symptoms of abrupt onset of difficulty in comprehending speech and neologisms. This was closely followed by weakness in the right upper and lower limb. He was alert, did not report headache, nausea, vomiting or ataxia and did not require assistance to walk. Three days prior to admission, the patient reported high-grade, intermittent fever which was accompanied by rigors. He self-medicated with paracetamol. He reported persistent episodic fever since then. He did not have a history of trauma, high-risk behaviour or consumption of illicit drugs or alcohol. He did not suffer from any premorbidities in the form of diabetes mellitus, hypertension or dyslipidaemia. There was no history of loss of consciousness at any point during this illness.

On admission, he was febrile (103.5°F), oriented, with a pulse rate of 124/min and blood pressure of

110/70 mm Hg. The rest of the physical examination was normal. Neurological examination revealed a right upper motor neurone facial palsy. Motor power was grade 4/5 in the right upper and lower limbs, right plantar was extensor with 3+ right deep tendon reflexes. Fundus examination was normal and the neck was supple.

INVESTIGATIONS

Investigations revealed a platelet count of 66 000 cells/mm³, haemoglobin of 13.8 g/dL and total white cell count of 3400 cells/mm³. Biochemical tests revealed the following: total bilirubin of 3 mg/dL, aspartate aminotransferase 102 IU/L, alanine aminotransferase 98 IU/L and lactate dehydrogenase 850 IU/L. Renal and coagulation parameters (including tests for Leiden factor 5 mutation and homocysteinaemia), urinalysis and chest roentgenography were normal. CT of the brain showed multiple small haemorrhagic bleeds mainly in the left temporal region with surrounding mild oedema and no significant mass effect. A CT angiogram of the brain did not reveal any vascular anomaly. Serological tests for leptospirosis, dengue, scrub typhus, HIV and hepatitis B were negative. Immunochromatography and quantitative buffy coat tests for *vivax* malaria were positive. Rapid diagnostic test to detect *Plasmodium falciparum*-specific histidine-rich protein 2 was negative. PCR was not performed to confirm *P. falciparum* infection due to its non-availability in our setting. Peripheral smear showed ring forms, trophozoites and schizonts of *vivax* malaria and no evidence of mixed infection with *P. falciparum*. Ultrasonography showed mild hepatosplenomegaly.

DIFFERENTIAL DIAGNOSIS

Atypical presentation of *vivax* malaria.

TREATMENT

We initiated antimalarial therapy with hydroxychloroquine (1500 mg base) and primaquine (15 mg base) for 14 days for the prevention of relapse, combined with antioedema (intravenous furosemide and mannitol) and prophylactic antiepileptic measures (oral phenobarbitone). On day 3, he developed right focal seizures with secondary generalisation. Intravenous phenytoin was added to control the seizures. Intravenous artesunate was started in view of his neurological deterioration at 2.4 mg/kg as zero dose, at 12 and 24 h, and then, once a day for 5 days.



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OUTCOME AND FOLLOW-UP

A repeat CT of the brain did not show any fresh haematoma or increase in the size of the existing lesion. He continued to have three more episodes of similar seizures. Over the course of the next 3 days, the patient's condition improved, circumventing the need for emergency surgical decompression. There were no further seizures and the patient was afebrile. On day 6, he was able to comprehend simple commands. Power in the right upper and lower limb improved to grade 5. A repeat peripheral smear was negative for malaria parasite. At 1 month follow-up, there was complete recovery of speech deficit.

DISCUSSION

Central nervous system involvement in malaria is most often due to widespread endothelial activation, damage and increased permeability. In the case of *falciparum* malaria, the parasitised red blood cells (RBCs) develop knob-like projections on their surfaces attaching themselves to the endothelial surfaces, thus leading to blockage of cerebral vessels. Further agglutination of the non-parasitised RBCs around the parasitised ones worsens the venous obstruction, producing diffuse cerebral anoxia and upregulation of the inflammatory mediators such as tumour necrosis factor α and nitric oxide.³ While *falciparum* malaria is notorious for its cerebral involvement, very few cases due to *vivax* malaria exist in the literature. Cerebral involvement due to *vivax* malaria is thought to be due to nitric oxide production. Novel cases of spontaneous subarachnoid haemorrhage,⁴ extradural haemorrhage⁵ and thalamic bleed⁶ have been reported.

We report one such rare presentation, with our patient presenting with symptoms of sudden onset aphasia with haemiparesis. On further probing he revealed a history of intermittent fever conforming to the pattern seen with malaria, which was supported by endemicity of the disease and positive tests for *vivax* malaria. With the absence of history of trauma, we ruled out a vascular anomaly by normal CT angiogram of brain. Although the blood picture did reveal thrombocytopenia, the value however was not severe enough to produce spontaneous intracranial bleeding.

With escalating cases of severe disease and growing chloroquine resistance,⁷ the focus of malaria programmes in India should be extended towards control of *P. vivax* in addition to *P. falciparum*. Lacunas exist in genetic research of *P. vivax*, albeit it comprises the majority of malaria cases in our country. In comparison to bottlenecks that *P. falciparum*⁸ has undergone over time, *P. vivax* has experienced a more stable transmission, making it prone to more genetic polymorphisms and diversities.⁹ This facilitates the parasite to escape the host protective immunity, furthermore the development of drug resistance. Efforts are in progress to develop newer genetic sequencing technologies to identify early treatment failure with chloroquine in *vivax* malaria.¹⁰ As per the 2012 WHO recommendation artesunate combination therapy are recommended especially in areas of documented chloroquine resistance for rapid and effective clearance of *P. vivax* along with a 14-day course of primaquine.¹¹

In conclusion, we would like to highlight this unique presentation of *vivax* malaria as intracranial haemorrhage with haemiparesis and speech abnormalities, requiring a high degree of suspicion for prompt diagnosis and institution of effective therapy to evade further morbidities.

Learning points

- ▶ *Vivax* malaria can no longer be viewed as a benign disease with increasing reports of serious manifestations such as severe anaemia, acute respiratory distress syndrome and severe thrombocytopenia.
- ▶ Intracerebral bleeding is a rare presentation of *vivax* malaria requiring a high degree of suspicion for prompt diagnosis and appropriate therapy.
- ▶ A combination of chloroquine and artesunate therapy is recommended for effective treatment in cases of severe *vivax* malaria.

Contributors SSK, KCM and AG were involved in the concept, design, definition of intellectual content and literature search. In addition, SSK and AG were involved in data acquisition. SSK, KCM and AG were in addition involved in the preparation, editing and review of the manuscript. AG and SSK were involved in the clinical care of the patient.

Competing interests None.

Patient consent Obtained.

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