

Case Report

J Vect Borne Dis 43, December 2006, pp. 206–208

Plasmodium ovale – a case report from Gujarat

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Key words Malaria – *Plasmodium ovale*

The geographical distribution of the four human malaria parasite species—*Plasmodium falciparum*, *P. vivax*, *P. malariae* and *P. ovale* is variable and is dependent on a number of factors such as season, endemicity and vector distribution. *P. vivax* is the most widely distributed and the most common species observed in temperate regions of the world, while *P. falciparum* is the most widespread throughout the world's tropics¹. Records of *P. ovale* infection are scanty in all geographical areas of the malaria-endemic world, with the exception of tropical Africa. *P. ovale* is seldom seen except in sub-Saharan Africa and on some islands of the western Pacific.

However, in some parts of the tropical western Pacific region *P. ovale* appears more consistently. A prevalence of that magnitude was thought to occur only in tropical Africa but it seems that this may no longer be so¹. The occurrence of *P. ovale* has not been very common in India and till date only three reports of *P. ovale* are available from Kolkata², Orissa³ and more recently from Delhi⁴. We report a first case of *P. ovale* from Gujarat, India.

Case report: A 42 years old male presented in a private clinic in Baroda with high-grade fever with rigors. The patient gave the history of intermittent high fever for the past 4–5 days accompanied by chill and rigor, body-ache and vomiting.

The laboratory investigations revealed that the patient was diabetic and moderately anaemic with 11.7 g% haemoglobin, The total WBC count was 5800 per cu mm and there was thrombocytopenia with platelet count 104,000 per cu mm. Urine examination revealed proteinuria, sugar and granular casts were observed in the microscopy of urine sediments. His liver was unpalpable whereas the spleen was soft, tender and one finger enlarged.

The blood smear was stained with Leishman's stain and examined on 5 May 2006. The smear was positive for malaria parasite, which looked like *P. vivax* in thick smear at first glance. However, careful examination of thin smear revealed it as *P. ovale* on the basis of specific morphological characteristics⁵. Many infected red blood corpuscles (RBC) were oval in shape (Fig. 1a), some were fimbriated on one end with heavy coarse Schuffner's (James) stippling even in early trophozoite stage (Fig. 1a). Early trophozoites with comet shaped RBC (Fig. 1b). The cytoplasm of the growing parasite was thick, compact and usually not amoeboid (Figs. 1c & d), early schizont form comet shaped with abundant Schuffner's (Fig. 1e), early schizont of *P. ovale* with few merozoites (Fig. 1f), early oval shaped schizont with coarse James dots (Fig. 1g), gametocytes of *P. ovale* (Fig. 1h). All these features of the parasite and infected red blood cells were confirmatory for *P. ovale*.

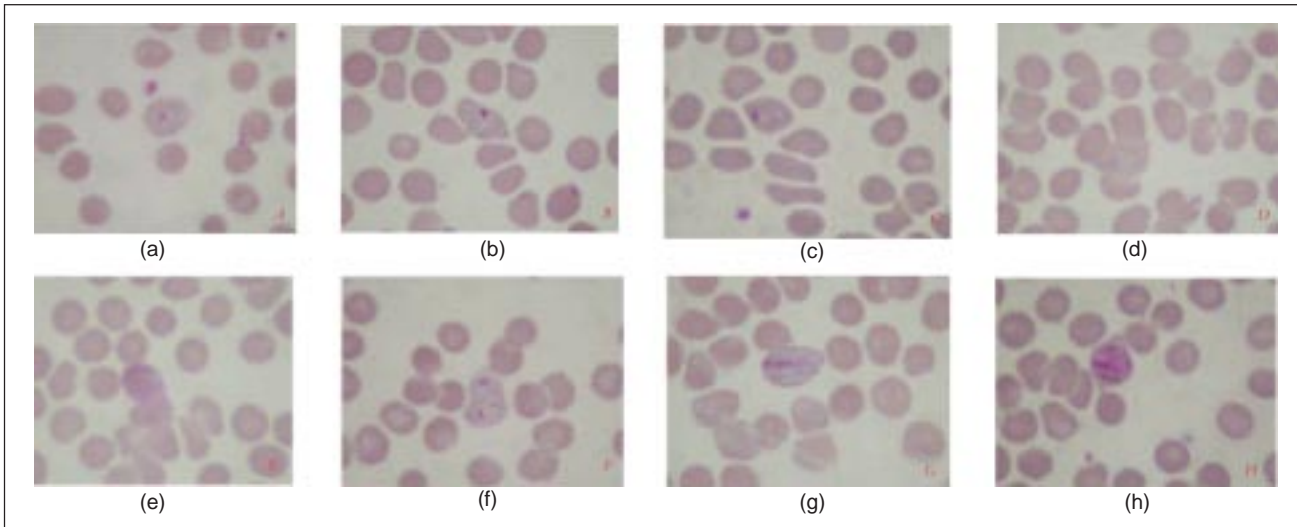


Fig. 1: (a) [x 1000] early trophozoites with oval RBC showing Schuffner's (James) stippling; (b) [x 1000] early trophozoites with comet shaped RBC; (c,d) [x 1000] early trophozoites with thick, compact cytoplasm and usually not amoeboid; (e) [x 1000] early schizont form comet shaped with abundant Schuffner's (James) stippling; (f) [x 1000] early schizont of *P. ovale* with few merozoites; (g) [x 1000] early oval shaped schizont with coarse James dots; and (h) [x 1000] gametocytes of *P. ovale*

The patient was administered chloroquine. Malaria parasites were not detected in the follow-up slide, indicating that the patient responded positively to the treatment of chloroquine. Primaquine was given to the patient for the radical treatment as the G-6-PD was found normal.

Discussion: *P. ovale* was the last of the malaria parasites of humans to be described. Stephens⁶ proposed the name *P. ovale* in 1922. He published a full description of the forms in the blood and named the parasite. *P. ovale* in recognition of the oval shape of some of the infected erythrocytes.

Occurrence of *P. ovale* has not been very common in India. We describe a case of locally acquired *P. ovale* malaria in Gujarat, India, because the patient had never travelled out of Gujarat, such transmission of malaria is a diagnostic and clinical challenge.

This case report raises an interesting contributing factor to the epidemiologic aspect of this species of *Plasmodium*. Special surveys should demonstrate

the distribution of the parasite and permit further investigations of the epidemiology of this form of malaria.

P. ovale is one of the two species of human malaria parasite (*P. vivax* is the other) that has a dormant liver stage (with hypnozoites) following primary infection. The hypnozoites can develop into mature schizonts and release merozoites into the blood stream causing clinical symptoms of malaria (relapsing malaria) even many months after the primary infection. Since the therapy of ovale infection is not different from that of vivax malaria, the specific identification of *P. ovale*, it seems, is mainly of academic interest. In conclusion, all four human malaria species occur in India and the exact prevalence of *P. ovale* is unknown. We hope that this case report may serve to alert malaria microscopists and to the malaria epidemiologists to the possibility of finding *P. ovale* in routine blood film examination. The article also alerts the malaria epidemiologists for the need of molecular diagnosis of malaria species, for appropriate treatment and better control of malaria in India.

Acknowledgement

We thank Dr. Collins, William E (CDC/NCID/PD) and the team of CDC/NCID/PD for their assistance in morphological identification of the species. We sincerely thank the team of Baroda Clinical Laboratory in their technical support in taking the images of the parasite.

References

1. Francis W Hombhanje. *Plasmodium ovale* species in Papua New Guinea—lest we forget. *PNG Med J* 1998; 41(3-4): 116–8.
2. Mukherjea AK, Chatterjee PK, Paul SC. A case of *Plasmodium ovale* infection. *Bull Calcutta Sch Trop Med* 1966; 14: 88–9.
3. Jambulingam P, Mohapatra SS, Das LK, Das PK, Rajagopalan PK. Detection of *Plasmodium ovale* in Koraput district, Orissa state. *Indian J Med Res* 1989; 89: 115–6.
4. Mishra B, Mirdha BR, Samantray JC. *Plasmodium ovale* malaria in Delhi. *Indian J Pediatr* 1999; 66: 143–4.
5. Matsumoto Y, Matsuda S, Yoshida Y. Ultra structure of erythrocytic stages of *Plasmodium ovale* in humans. *Am J Trop Med Hyg* 1986; 35: 689–96.
6. Stephens JWW. A new malaria parasite of man. *Ann Trop Med Parasitol* 1922; 16: 383–6.

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Received: 7 July 2006

Accepted in revised form: 22 August 2006