

Case Report

Symmetrical Peripheral Gangrene: A Rare Complication of Malaria

*Naresh Kumar*¹, *Niraj Bohania*², *S Anuradha*³

¹Professor of Medicine & Head of Pulmonary Medicine, Maulana Azad Medical College, New Delhi, India.

²Senior Resident, ³Director Professor, Department of Medicine, Maulana Azad Medical College, New Delhi, India.

DOI: <https://doi.org/10.24321/2349.7181.201915>

I N F O

Corresponding Author:

Naresh Kumar, 125, B.L. Taneja Block, Department of Medicine, Maulana Azad Medical College, New Delhi, India.

E-mail Id:

drnareshmamc@gmail.com

Orcid Id:

<https://orcid.org/0000-0003-4581-609X>

How to cite this article:

Kumar N, Bohania N, Anuradha S. Symmetrical Peripheral Gangrene: A Rare Complication of Malaria. *J Adv Res Med* 2019; 6(3): 16-18.

Date of Submission: 2020-01-10

Date of Acceptance: 2020-01-31

A B S T R A C T

Symmetrical Peripheral Gangrene (SPG) is one of the very rare and devastating complication of malaria. We report a 45-year-old gentleman who presented with fever and blackish discoloration of digits. Examination revealed mild splenomegaly, cold peripheries with dry gangrene involving bilateral fingers and toes. Investigations revealed thrombocytopenia and transaminitis. Rapid malaria test was positive for both *Plasmodium falciparum* and *Plasmodium vivax*. Patient was treated with antimalarials. Clinicians managing malaria should be more vigilant for this rare devastating complication.

Keywords: Malaria, Fever, SPG

Introduction

Malaria is one of the commonest infections seen in Indian population, which often presents with various complications but Symmetrical Peripheral Gangrene (SPG) as a complication of malaria is very rare. SPG is one of the devastating complications of malaria which is characterized by distal ischemic gangrene of two or more sites in the absence of large vessel obstruction or vasculitis.¹ This is rarely anticipated during management of malaria patients. We report a 45-year old gentleman who presented with symmetrical peripheral gangrene, a rare complication of malaria.

Case Report

A 45-year-old man presented with seven days history of high-grade fever with chills and rigors. Patient developed blackening of his toes and fingers on the fifth day of fever which was associated with pain (Figure 1). There was no

history of diabetes mellitus, hypertension, drug intake, recent trauma to limbs, exposure to cold, bleeding from any site, alcohol use, and smoking. Examination revealed pulse rate of 110 beats/ min, regular, bounding, with all peripheral pulses were palpable, blood pressure of 120/ 70 mmHg (comparable in all four limbs), temperature of 101.2°F and respiratory rate of 20 breaths/ min. His peripheries were cold with dry gangrene involving bilateral fingers and toes. Respiratory, cardiovascular and abdominal system examination were unremarkable. Neurological examination revealed decreased sensations over gangrenous area. Clinical diagnosis of septicemia with symmetrical peripheral gangrene was kept.

Initial investigations (Table 1) showed thrombocytopenia, raised total leucocytes, prerenal acute kidney injury, transaminitis, increased FDPs and prolonged Prothrombin Time (PT).



Figure 1. Showing dry gangrene of all the digits in both hands

Table I. Investigations of the patient

Parameters	Result
Hemoglobin	12.2 gm/ dL
Total Leukocyte Count (TLC)	10200/ uL
Platelet count	91,000 / mm ³
Blood urea	64 mg/ dL
Serum creatinine	1.3 mg/ dL
Total bilirubin	0.6 mg/ dL
AST	212 U/ L
ALT	227 U/ L
Alkaline phosphatase	170 U/ L
Random blood sugar	110 g/ dL
Autoimmune profile (ANA, dsDNA, Scl-70, APLA, U1RNP)	Negative
HIV, HBsAg, Anti HCV Ab, Dengue serology	Negative
Blood culture, urine routine and urine culture	Normal
Chest x-ray	Normal
Echocardiography	Normal
Fibrin Degradation Products (FDPs)	Increased
Prothrombin Time (PT)	19 secs (Control-12 secs)
Activated plasma thromboplastin time	29 secs (Control-27 secs)

Rapid malaria dipstick test was positive for both *Plasmodium falciparum* and *Plasmodium vivax*. Arterial doppler of bilateral lower limbs revealed normal flow in the femoral and the popliteal, with slightly reduced flow in the dorsalis pedis with no distal flow bilaterally. In the upper limbs normal flow in the proximal arteries with diminished flow in the distal arteries bilaterally was noted.

Patient was treated with antimalarials (intravenous

Artesunate and Doxycycline). Clear line of demarcation appeared in the fingers. Patient was then referred to plastic surgery department for further follow up.

Discussion

Malaria is a mosquito-borne infectious disease which often presents with multiple complications especially in a case of *Plasmodium falciparum* (pf) malaria. Common complications

of malaria include thrombocytopenia, acute kidney injury, acute respiratory distress syndrome, hepatitis, cerebral malaria (hypoglycemia, seizures), metabolic acidosis and hemolysis.² SPG as a complication of malaria is very rare and it is described mostly in pf malaria cases. In our case there was dual infection with *Plasmodium vivax* and *Plasmodium falciparum* malaria. Few theories have been proposed to explain SPG in a case of malaria. In *Plasmodium falciparum* infections, heavy parasitemia stimulate complement system which in turns activate coagulation pathway leading to thrombosis of microcirculation resulting in peripheral gangrene.^{3,4} In another explanation, infected erythrocytes via intercellular adhesion molecule 1 (ICAM-1) get attached to receptors on capillary endothelium (cytoadherence). Infected erythrocytes stick inside and eventually block microcirculation leading to thrombosis and eventually gangrene.⁵ Various treatment modalities have been tried in SPG associated with malaria including anticoagulants, vasodilators, hyperbaric oxygen therapy etc. but none of them have been shown to be beneficial.⁶ In our case, we did not use any anticoagulants or vasodilators for SPG. According to the literature, mortality rate may be as high as 35% with rate of amputation ranging from 70% to 90%.⁷ Fortunately, outcome was positive in our case with almost full functional recovery of all four limbs.

Other causes of SPG include sepsis, low cardiac output states like dilated cardiomyopathy, vasopressor use, ergot poisoning but its association with malaria is rare. In our case, all the other possible causes of symmetrical peripheral gangrene were ruled out. Our patient remained hemodynamically stable throughout the course of the disease. The patient improved after receiving antimalarial therapy only which clearly indicates that malaria was the underlying cause of SPG in this case. SPG has been reported with *Plasmodium falciparum* as well as *Plasmodium vivax* malaria.^{8,9} However, our case had mixed infection with both.

To conclude, SPG is a rare complication of malaria and clinicians must be aware of this complication while dealing with cases of malaria.

Conflicts of Interest: None

References

1. Sharma BD, Kabra SR, Gupta B. Symmetrical peripheral gangrene. *Trop Doct* 2004; 34(1): 2-4. Available from: <https://journals.sagepub.com/doi/abs/10.1177/004947550403400102> [PubMed/ Google Scholar].
2. Nicholas JW, Joel GB. Malaria. In: Longo DL, Fauci AS, Kasper DL, et al, editors. *Harrison's Principles of Internal Medicine*. 18th ed. McGraw Hill, New York. 2012; 1688-703.
3. Clemens R, Pramoolsinsap C, Lorenz R, Pukrittayakamee S, Bock HL, White NJ. Activation of the coagulation cascade in severe falciparum malaria through the intrinsic pathway. *Br J Haematol* 1994; 87(1): 100-105. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1365-2141.1994.tb04877.x?sid=nlm%3Apubmed> [PubMed/ Google Scholar].
4. Philips RE, Looaresuwan S, Warrell DA, Lee SH, Karbwang J, Warrell MJ et al. The importance of anaemia in cerebral and uncomplicated falciparum malaria: role of complications, dyserythropoiesis, and iron sequestration. *Quart J Med* 1986; 58(227): 305-323. Available from: <https://academic.oup.com/qjmed/article-abstract/58/3-4/305/1560540?redirectedFrom=PDF> [PubMed/ Google Scholar].
5. Ghosh SK, Bandyopadhyay D. Symmetrical peripheral gangrene. *Indian J Dermatol Venerol Leprol* 2011; 77(2): 244-248. Available from: <http://www.ijdv.com/article.asp?issn=0378-6323;year=2011;volume=77;issue=2;page=244;epage=248;aulast=Ghosh> [Google Scholar].
6. Parmar MS. Symmetrical peripheral gangrene: a rare but dreadful complication of sepsis. *CMAJ* 2002; 167(9): 1037-1038. Available from: <https://www.cmaj.ca/content/167/9/1037.long> [PubMed/ Google Scholar].
7. Ghosh S, Bandyopadhyay D, Ghosh A. Symmetrical peripheral gangrene: a prospective study of 14 consecutive cases in a tertiary-care hospital in eastern India. *Journal of the European Academy of Dermatology and Venereology* 2010; 24: 214-218. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1468-3083.2009.03329.x> [PubMed/ Google Scholar].
8. Kumbhalkar S, Aher S, Wanjari S. Symmetrical peripheral gangrene: A rare complication of Plasmodium falciparum malaria. *Ann Trop Med Public Health* 2017; 10(1): 238-240. Available from: <http://www.atmph.org/article.asp?issn=1755-6783;year=2017;volume=10;issue=1;spage=238;epage=240;aulast=Kumbhalkar>.
9. Prabhat K, Ghazal T, Gupta H, Dixit J. Symmetrical peripheral gangrene in severe *Plasmodium Vivax* malaria. *Indian J Crit Care Med* 2017; 21: 245-246. Available from: https://www.ijccm.org/doi/pdf/10.4103/ijccm.IJCCM_424_16 [PubMed/ Google Scholar].