Symmetric Peripheral Gangrene and Falciparum Malaria

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Abstract
Sudden onset symmetric peripheral gangrene (SPG) is a relatively uncommon clinical entity manifested by distal ischemic damage at two or more sites in the absence of large vessel obstruction. Here we report a case of complicated falciparum malaria with rapid onset SPG involving all the toes.

INTRODUCTION
Symmetric peripheral gangrene was initially described in 1981 by Hutchinson. It is defined as symmetrical distal ischemic damage at two or more sites in the absence of large vessel obstruction. Classically, it accompanies infectious diseases of various etiologies as well as low flow states such as cardiogenic or hypovolemic shock.

Currently, it is most commonly seen as a complication of blood stream infection of bacterial, viral or rickettsial origin. Less commonly it is described as a complication of paraneoplastic syndrome, ergotism, polymyalgia rheumatica, Raynaud’s phenomenon, C-protein deficiency and perhaps sickle cell disease. Vasopressor therapy may or may not be an aggravating factor in septic patients. In non-septic patients, administration of vasopressor agents clearly can precipitate the onset of SPG. No modality of treatment is universally effective in managing SPG, nor can any single aetiology apply to all cases. The term “purpura fulminans” is sometimes used synonymously with SPG and does have some feature in common with it.

CASE REPORT
A 26 years lady with three children, last child birth 3 years back, without history of abortion, tea garden worker (in Assam) by occupation, presented with blackish discoloration of all the toes of 15 days duration. Eight days before the onset of the black discoloration of the toes she had high fever with chill and rigor. On the 2nd day of fever, she became unconscious and got admitted to a local hospital. There she was diagnosed to be a case of Plasmodium falciparum malaria and was treated with standard dose of Artisunate and third generation cephalosporin. She regained consciousness on the 4th day and fever subsided from the next day. On the 6th day of fever she suddenly developed burning sensation over the toes involving both lower limbs simultaneously with swelling over dorsum of the feet. After two days, she noticed black discoloration of all toes followed by gradual disappearance of burning sensation and swelling. There was no history of ulcer over the toes, Raynaud’s phenomenon, oral ulcer, malar rash, joint pain, chest pain, dyspnoea, convulsion and stroke.

On physical examination - patient was afebrile; mild pallor was present; icterus, dehydration, cyanosis, oedema were absent. Pulse rate - 86/min, regular, normal in volume and character, without radio-radial or radio-femoral delay, all the peripheral pulses including dorsalis pedis were palpable. Blood pressure was 120/84 mm Hg.

Her cardiovascular, respiratory, neurological and abdominal examinations revealed no abnormality clinically. On local examination of feet, there was blackish discoloration of all the toes which were cold, shrunken and dry with definite line of demarcation without any local rise of temperature and ulceration.

On investigations peripheral blood smear for Plasmodium falciparum was positive. Other laboratory investigations included, Hb -9.75gm/dl, total WBC - 6,500/cu mm, DLC-N 59 L 35 E2 M4, ESR - 10 mm, platelet count - 2.3 lacs/mm3, RBS -130mg/dl, S.creatinine - 0.953mg/dl, S.bilirubin -0.962 mg/dl, total protein - 6.56mg/dl, AST -28.6 IU/L, ALT - 24.6 IU/L, alk phosphatase - 171 IU/liter, BT- 1 min 35 sec, CT - 2 min 05 sec, PT © - 11.5 secs. Blood and urine culture, test for anti-nuclear antibodies (ANA), LE cells, Rh factor, VDRL, Coomb’s test (direct and indirect) were negative. Doppler study upto the dorsalis pedis demonstrated normal flow pattern.

DISCUSSION
Although the association of SPG with Plasmodium falciparum malaria was documented in literature, it appears to be a rare phenomenon. The condition most commonly implicated is the presence of DIC, which was documented by laboratory test but not necessarily with clinical manifestation in the form of bleeding disorder. The previous studies noted
that no significant bleeding complications were associated in the majority of the cases of SPG and DIC.¹

The most common cause of SPG in the clinical settings is septicaemia. Other conditions include: asplenia, immunosuppression, diabetes mellitus;² renal failure, cold injury to the extremities, myoglobulinaemia, increased sympathetic tone and the use of vasopressor drugs. SPG may also be a manifestation of multiorgan system failure.

Three cases of SPG were reported in association with Plasmodium falciparum malaria and investigations documented the presence of DIC in all the three patients. None of the patients had any bleeding manifestations clinically.³ Another case of symmetric peripheral gangrene in association with Plasmodium falciparum malaria was reported from Sri BM Patil Medical College, Bijaur.⁴

The precise mechanism that initiates the process of coagulation and fibrinolytic pathways in Plasmodium falciparum malaria is not well understood. Cytoadherence and rosetting lead to micro-circulatory obstruction in malaria.⁵ Several vascular receptors for the adhesive surface protein of infected erythrocytes have been identified - which causes adhesion of the infected red cells to the vascular endothelium. The molecules responsible are CD-36, intra-cellular adhesion molecule-1 (ICAM-1), thrombospondin (TSP), vascular cell adhesion molecule-1 (VCAM-1), endothelial leukocyte adhesion molecule-1 (ELAM-1) and histidine, rish protein (HRP).⁶ Although DIC could not be documented its presence could be possible in view of the finding of other workers where manifestation of spontaneous bleeding was not found.

As Plasmodium falciparum was positive in peripheral blood smear and the patient recovered with antimalarial drugs it may be concluded that the patient had SPG as a complication of Plasmodium falciparum malaria.

REFERENCES

Fig 1 : Gangrene of all the toes of both feet
Fig. 2 : Gangrene of all the toes of both feet with definite line of demarcation

Announcement
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Indian Society of Electrocardiology Conference 2005 will be held in Chennai on 12 to 14th March, 2005.

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