Purpura Fulminans in a Complicated Falciparum Malaria


Abstract

A 19-year-old male presented with fever, oliguria and purpuric lesions involving both hands. The patient was diagnosed as a case of purpura fulminans with disseminated intravascular coagulation due to complicated Falciparum malaria. The case is presented to sensitize the physicians to keep malaria as a differential in cases of fever with purpura fulminans.

INTRODUCTION

Purpura fulminans (PF) is a life threatening disorder of acute onset characterized by cutaneous hemorrhage and necrosis caused by disseminated intravascular coagulation and dermal vascular thrombosis. Three existent categories can be identified: inherited or acquired abnormalities of protein C or other coagulation systems, acute infectious PF and idiopathic. Typically, acute infectious purpura fulminans occurs in young children below 2 years of age, usually in the setting of meningococcemia due to elaboration of endotoxin. Here we present a case of purpura fulminans in the setting of complicated falciparum malaria.

CASE REPORT

A 19-year-old male resident of Indian subcontinent presented with complaints of moderate grade fever with chills and rigors for 7 days. He also complained of decreased urine output, epistaxis, melena and progressive discoloration of digits of the upper limb for 3 days. The patient was not a known case of any bleeding disorder. There was no history of photosensitivity, oral ulceration, or joint pains. At admission he had hypotension (BP-90/60 mm Hg), pallor with bilateral subconjunctival hemorrhage and purpuric rashes on bilateral digits of hands and some bullae on the dorsum of the left hand. Rest of the general physical and systemic examination was normal.

Investigations showed anemia (Hb-7.5 mg/dL), thrombocytopenia (platelet count -38,000/cumm) and leukocytosis (20,400) with no left shift. He had a blood urea of 336 mg/dL, serum creatinine – 7.3 mg/Dl and serum K – 5.8. He had normal serum bilirubin - 1.1mg/dL and elevated enzymes (SGOT- 56 IU, SGPT-72 IU). Urine showed protein +, and 3-5 red blood cells with no active sediments. His prothrombin time and partial thromboplastin time were prolonged and he had a positive D-dimer test with fibrin degradation products being positive in significant titers. The peripheral blood film examination showed gametocytes and trophozoites of falciparum malaria and test for malarial falciparum antigen was positive. He had a normal x-ray chest and ultrasound examination of the abdomen showed normal sized kidneys with increased echogenicity and maintained corticomedullary differentiation.

Based on the clinical picture and investigations a diagnosis of complicated malaria with disseminated intravascular coagulation (DIC) and purpura fulminans was made.

He was started on IV quinine 10 mg/ kg q 8 hourly for 10 days, and injection artemesunate 120 mg followed by 60 mg for 3 days along with extended spectrum cephalosporin and hemodialysis support. He was also given fresh frozen plasma and whole blood transfusions along with pentoxifylline.

Subsequently the results of blood culture, urine culture,VDRL, antiphospholipid antibody, LE cell, ASO titers, cryoglobulins, and rheumatoid factor, ANCA, anti ds- DNA were negative.

His leucocytic count touched baseline by 6 days and by the end of 2 weeks his platelet count normalized. A repeat peripheral smear was normal. He however remained oligo-anuric for which he was subjected to 10 sessions of hemodialysis over a period of one month. The patient subsequently went into diuretic phase and renal failure recovered. Purpuric lesions over the hands
slowly progressed to a state of dry gangrene and a line of demarcation has set in (Figs 1a and b).

**DISCUSSION**

We describe a case of purpura fulminans with disseminated intravascular coagulation due to complicated malaria an association which has only rarely been reported.\textsuperscript{2,3} The diagnosis of PF should not be entertained in the absence of DIC and at least one positive test of generation of thrombin should be present to make a diagnosis of DIC.\textsuperscript{4} In our patient, prolonged prothrombin time, thrombocytopenia, along with elevated titers of fibrin degradation products and specifically positive D-dimer test establish the diagnosis of DIC which along with the skin lesions and typical peripheral smear points to a diagnosis of purpura fulminans due to falciparum malaria.

Most cases of acute infectious PF are associated with meningococcal sepsis. It occurs only rarely in the course of infection with other organisms even in the setting of septicemia with disseminated intravascular coagulation.

Purpura and cutaneous gangrene have been reported as the presenting symptoms of malaria in the past however in both the case reports a diagnosis of PF was not entertained as there was no evidence of DIC.\textsuperscript{2} Approximately 60 to 70% cases of acute purpura fulminans have been reported amongst children below 2 years of age while our patient was 19 year old.\textsuperscript{1} Keri et al have also described a case of PF in a 44 year old female with malaria who failed to respond to chloroquine, however responded to Doxycycline.\textsuperscript{2} Kato et al have reported a case of falciparum malaria with PF and DIC in a 67 year old female from sub-Saharan Africa.\textsuperscript{3} It may be argued that our case could have had sepsis and DIC, however we could not detect any such focus and all blood cultures and urine cultures came sterile.

The exact mechanism responsible for DIC in malaria is not well understood. It is believed that cytoadherence and rosetting may lead to obstruction in the microcirculatory bed.

CD-36, thrombospondin (TSP), endothelial leukocyte adhesion molecule-1 (ELAM-1), vascular cell adhesion molecule-1 (VCAM-1), intra-cellular adhesion molecule-1 (ICAM-1), and histidine rich protein (HRP) have been identified as the various receptors which may cause adhesion of the infected red cells to the vascular endothelium.\textsuperscript{5}

Treatment of purpura fulminans includes vigorous antibiotic management of any associated infection. Other experimental modalities which have been tried in these cases are the administration of protein C concentrate, antithrombin III concentrate, tissue plasminogen activator, prostacyclins, vasodilators, plasmapheresis, hyperbaric oxygen. Our case responded to quinine and artesunate.

**CONCLUSION**

We conclude that falciparum malaria is a cause of DIC and purpura fulminans. The present case highlights this rare complication of complicated Falciparum malaria and the need for high index of suspicion of this clinical entity to differentiate it from other conditions such as collagen vascular diseases, thrombotic thrombocytopenic purpura, and other conditions associated with peripheral gangrene. Also it emphasizes the need to suspect and treat malaria when a patient presents with fever and purpura especially after a visit to endemic areas.

**Learning Points:**
1. Complicated malaria may mimic meningococcaemia in its presentation.
2. It should be considered as a differential in cases of fever with peripheral gangrene.
3. Complicated malaria is a rare cause of DIC the pathogenesis of which is poorly understood.
4. Prompt management with antimalarials, intravenous antibiotics and vasodilators is important.

Acknowledgements
1. Dr. Rita Sood, Department of Medicine, AIIMS.
2. Dr. G. C.Khillani, Department of Medicine, AIIMS.

REFERENCES

Book Review

GERIATRIC CARE 2008
A Text Book of Geriatrics and Gerontology
Edited by Dr. OP Sharma

The number of elderly persons is increasing all over the World, including in India. The age related changes which are heterogeneous occur at anatomical as well as physiological levels in various organs. The elderly are susceptible to the same diseases to which the middle-aged persons succumb. In addition these persons are afflicted by degenerative disorders and more of Cardiovascular and Cerebro-vascular diseases, Infections and Malignancy. The care of elderly has become complex and they have to ‘live with’ rather than ‘die from’ chronic ailments in advancing age. This has necessitated care by a comprehensive multi-disciplinary approach.

There is a great explosion of knowledge in the recent decades, and medical science has witnessed tremendous advances in understanding the patho-physiology of many disorders. It has resulted in utilization of newer diagnostic techniques and application of newer modalities of treatment. This has changed the pessimistic attitude towards elderly to an enthusiastic approach with all kinds of medical and surgical interventions both therapeutic as well as preventive.

Dr O.P. Sharma envisioning the need of an updated learning material for Indian Doctors, engaged in the care of elderly, has done a valuable service by bringing out the third edition of Geriatric Care 2008. The book has been thoroughly revised from the time of its first publication in 1999. This multi-disciplinary and multi-authored book has 13 parts with 98 chapters spread over 800 pages. The leading medical men from different parts of the country have contributed to the book. The science and art of medicine, being a life-long learning process, the physicians who are involved in geriatric care have to be constantly on the move to update them-selves and widen their knowledge. This text book of Geriatrics and Geriatric care discusses the current issues facing elderly persons.

The initial sections of the book discuss biological and cellular changes of aging, basics clinical approach and investigations. Then starts Medicine which covers diseases under Cardiovascular system, Respiratory system, Gastrointestinal system, Rheumatology, Endocrinology, Nephrology, Neurology, Psychiatric, Hematology, Skin, Sexuality and Nutrition. Then come other specialties like Anaesthesia, Dentistry, Surgery, Urology, Orthopaedics, Rehabilitation, Gynaecology, ENT, Eye, Community and Preventive geriatrics. The book also has chapters on therapeutics, infrastructure and medical setup as well as lab values pertaining to Indian elderly. The remarkable aspect is a comprehensive coverage including subjects like Financial health, Legal issues and Prevention of ageing.

The book contains a wealth of information to all practicing geriatricians. The book should find place in all hospitals, and medical establishments, and libraries of the Medical Colleges.

PS Shankar
Gulbarga