

Nephrotic syndrome associated with *Plasmodium malariae* in infancy : A case report

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A progressive glomerulonephritis associated with Plasmodium malariae infection is known as quartan malarial nephropathy. This condition occurs only in a small number of patients. We report an 11-month-old infant presenting with generalized edema and proteinuria after having Plasmodium malariae infection.

Keywords : Nephrotic syndrome, *Plasmodium malariae* .

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ภาวะไตอักเสบที่มีการดำเนินโรคไปสู่ไตวายเรื้อรังและพบร่วมกับการติดเชื้อ *Plasmodium malariae* เรียกว่า *quartan malarial nephropathy* ภาวะนี้พบได้น้อย คณะผู้รายงานได้รายงานผู้ป่วยเด็กชายอายุ 11 เดือน มาด้วยอาการบวม มีโปรตีนในปัสสาวะหลังจากพบว่ามีอาการติดเชื้อ *Plasmodium malariae*.

คำสำคัญ : กลุ่มอาการเนฟโรติก, *Plasmodium malariae*.

The association of nephrotic syndrome with *Plasmodium malariae* infection in children has long been recognized.⁽¹⁾ There is a significant prevalence of chronic malarial nephropathy (quartan malarial nephrotic syndrome) in tropical countries, particularly Africa. This prevalence is obviously reduced following an eradication of malaria and a better supply of antimalaria.^(2,3) There are few data on quartan malarial nephrotic syndrome since 1975.^(1,4) In Thailand, there is no previous report of chronic malarial nephropathy in children. We report an infant with nephrotic syndrome and quartan malaria.

Case Report

An 11-month-old male infant presented with high intermittent fever, anemia and hepatosplenomegaly. The peripheral blood film revealed *P. malariae* (Figure 1). The identity of *P. malariae* was confirmed by Polymerase chain reaction. After treatment with primaquine the fever subsided. Two weeks later, he developed generalized edema and ascites. On physical examination his blood pressure was 114/64 mmHg and there was

hepatosplenomegaly. Urinalysis revealed a specific gravity of 1.015, protein 4+, 1-2 red blood cells and oval fat bodies in the sediment. Urine protein/creatinine ratios was 8, serum urea was 7 mg/dl, creatinine 0.3 mg/dl, albumin 1.9 g/dl, cholesterol 402 mg/dl, hematocrit 38%, white blood cell count 9,840/mm³ with normal differential and platelet counts. Antinuclear antibody, antistreptolysin O titer, hepatitis B antigen and human immunodeficiency virus were negative. The level of C3 complement was 95.1 mg/dl (normal).

A percutaneous renal biopsy was performed on day 11th after admission, yielding 27 glomeruli for study by light microscopy. All glomeruli revealed widening of the mesangial area with increased mesangial cells. Five glomeruli showed segmental scleroses with adhesions to the Bowman's capsule. The interstitium showed patchy edema with mononuclear cell infiltration. Immunofluorescent studies showed fine to coarse granular staining of IgG, IgM, C3 complement at mesangial area. There was no glomerulus in electron microscopic study. (Figure 2.)

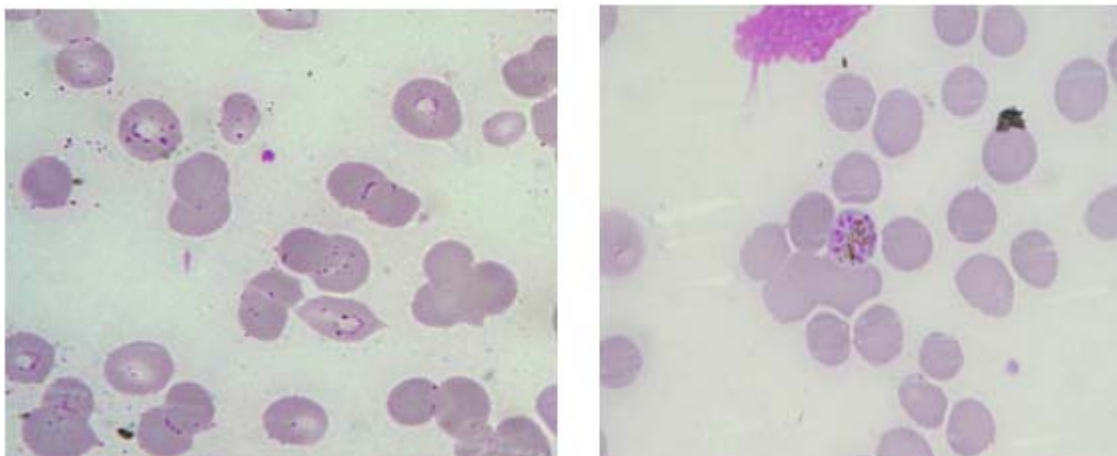


Figure 1. Peripheral blood smear shows ring forms and schizont of *Plasmodium malariae*.

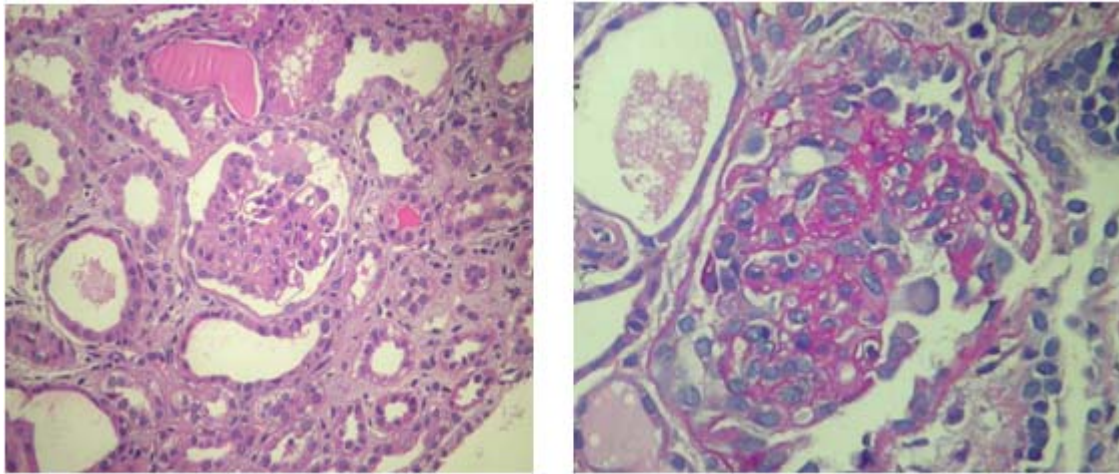


Figure 2. Light microscopy shows widening of mesangial area with increased mesangial cells.

Prednisolone was started on the patient with cyclophosphamide but he still had persistent proteinuria. After 9 months of follow up, his renal function is normal but hypertension requires treatment with enalapril and telmisartan.

Discussion

Plasmodium malariae infection is common in Africa, Burma, Sri Lanka, Malaysia and Indonesia but uncommon in Thailand. Quartan malarial nephropathy is a progressive glomerulonephritis associated with *P. malariae* infection and occurs only in a small number of patients.^(5,6) The majority of patients are children, with a mean age of 5 years. It is uncommon in the first 2 year of life.⁽⁷⁾ The main clinical symptoms is generalized edema. Fever usually occurs in the early stage and may be a characteristic of quartan malaria.⁽⁷⁾ Hepatosplenomegaly is seen in 50% of the cases.^(5,7) Blood pressure is usually normal but hypertension develops when disease progresses to glomerulo-sclerosis.⁽⁵⁾ The common urinary abnormalities are non-selective proteinuria and occasional microscopic hematuria in most cases.^(1,2)

Blood cholesterol level is usually not increased due to associated malnutrition.⁽⁷⁾ Serum C3 levels are normal but may be decreased in the early stage.

The glomerulopathologic changes vary as focal or diffuse proliferative glomerulonephritis, focal segmental sclerosis to membranous glomerulonephritis.^(8,9) The essential lesion consists of capillary wall thickening by the subendothelial deposits.⁽¹⁾ Tubulointerstitial lesions depend on the severity of the glomerular involvement. On immunofluorescence, granular pattern of IgG, IgM and C3 complement deposits are seen in glomeruli.⁽¹⁰⁾

The diagnosis of quartan malarial nephropathy in this case was based on the presence of *P. malariae* infection, clinical and laboratory data, renal pathology and exclusion of other causes of nephrotic syndrome. Our patient was not responsive to prednisolone and cyclophosphamide. This is similar to other reports.^(11,12) We used angiotensin converting enzyme inhibitor (ACEI) and angiotensin receptor blocker (ARB) to control hypertension. This decreased the proteinuria and preserve renal function.

Although quartan malarial nephropathy is uncommon, physicians should be aware of it in any patient with *P. malariae* infection who develops generalized edema and proteinuria. Patients need long-term monitoring of renal function and control of blood pressure because most patients progress to renal failure in 3 - 5 years.⁽⁷⁾

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