CLINICAL PRESENTATION OF MALARIA IN GHANA

J. O. O. Commey

Department of Child Health
University of Ghana Medical School, Accra.

Despite all attempts at control or eradication, malaria continues to affect an estimated 200 million people world wide, accounting for about 10% of all deaths in children under three years of age in some parts of Africa.[1]

Though some variations exist in the malaria produced by the different plasmodia; in all of them chills, fever, headache, muscle pains, splenomegaly and anaemia are common. Herpes labialis is frequent in well established infections while hepatomegaly, mild icterus and oedema are often observed, especially in falciparum malaria. This discussion will be restricted to the clinical presentations of the more dangerous falciparum malaria which accounts for over 90% of malaria cases in West Africa.[2]

Malaria in children is alway a serious illness with considerable variability. Rigors are particularly uncommon while convulsions, both simple febrile, and complicated types are quite common. Congenital malaria secondary to transplacental transfer of parasites is still extremely rare. Neonatal malaria arising from the mixture of maternal and infant blood during the delivery process may not be so uncommon. The expected protection of newborns and young infants from malaria infection as a result of transferred maternal antibodies appears to be quite defective. Symptomatic malaria with laboratory confirmation has been seen commonly in the late neonatal period and early infancy in our medical centre.

Malara is reported to be more severe in the expatriate child than in the partially immune indigene who may exhibit minimal symptoms in the presence of heavy parasitaemia. Severe malaria, however, has recently occurred fairly commonly in older children in Ghana (up to 33% in a recent series with cerebral malaria).[3]

This may be due to the documented delayed and depressed acquisition of protective malarial anti-bodies in urban and peri-urban dwellers of Ghana,[4] or the noted phenomenon of severe attacks reported in young Ugandan children given partial prophylaxis,[5] a phenomenon which mimicks the present situation of liberal access to inadequately and irregularly administered antimalarials among the population of Ghana[6].

Malaria is often described as a great imitator of other diseases, sharing various characteristics with other childhood illnesses like influenza, tuberculosis, typhoid, brucellosis, and urinary tract infections. Even more confusing, malaria may coexist with other diseases.

The biologic characteristics of *P. falciparum* are sufficiently different from the other human malarial parasites to be reflected in the peculiar, often bizarre clinical features and pathology of its malaria. The fundamental differences include:

(a) Internal sporulation with *P.falciparum* completing the latter part of its asexual cycle in the capillaries where the parasitized red cells adhere to each other and to the endothelial lining of the small vessels resulting in varying degrees of obstruction;

(b) Marked invasiveness from the rapid rate of

parasite multiplication where parasite density is only limited by the number of red blood cells.

(c) "Asychronicity" of parasite multiplication accounting for the unpredictable and frequently irregular temperature presentation.

If an acute attack of malaria is diagnosed early and treated appropriately the disease is usually mild and recovery uneventful.

Complications tend to occur suddenly in apparently not seriously ill patients, hence the need to consider the diagnosis and start early treatment. At the onset of and throughout a falciparum malaria attack definite diagnosis cannot be made from clinical features in the absence of blood examinations.

Excessive reliance on positive peripheral parasitaemia however is fraught with dangers. Earlier researchers like Bagster[7] and Edington[8] showed that cerebral malaria may present with negative peripheral parasitaemia just before death only to find at autopsy that cerebral capillaries are choked with parasitized red blood cells. In spite of this evidence a fairly authoritative modern standard text states that "the report of a negative blood film in a case of cerebral malaria means that the diagnosis has been wrong". Indeed as far back as 1943 Col. Lindsay[9] had remarked that "A negative blood slide has sent many to the grave". This grave statement needs to be viewed in the light of the incontrovertible fact that the peripheral trophozoite of falciparum, the ring form, is easily missed by the inexperienc

Numerous attempts have been made to classify the various clinical manifestations of falciparum malaria on the basis of the predominant organ or system involved. Though this may be useful, it can also be misleading if one fails to recognize the possibility that the infection may involve several systems with equal severity at the same time.

Based on the ease of recognition clinical malaria in Accra can be divided into six main types:

(a) The Febrile type

(b) The Cerebral type

(c) The Gastrointestinal type

(d) The Pulmonary type

(e) Blackwater Fever

(f) The Miscellaneous group

The Febrile Type

Fever itself, the main feature, is usually of sudden onset with a chilly feeling and shivering, soon followed by feverishness and profuse perspiration. The fever is often accompanied by headache, backache and generalised aches and pains, particularly in the back of the neck and across the shoulders. Vomiting, usually with much retching, is often present, accompanied by diffuse abdomial pains or pains localised to the left hypochondrium (especially in patients with rapid splenic enlargement).

Though fever of some degree is common in most cases of malaria, a patient with falciparum malaria may sometimes remain entirely afebrile even with heavy parasitaemia. Fever is very variable; may be continuous or be completely overshadowed by the severe manifestations related to cerebral, pulmonary, or other systems.

Since the latter months of 1987 the southern half of Ghana has recorded numerous cases of confirmed malaria with recurrent or persistent pyrexia and some delay in the clearance of perpheral parasitaemia. The phenomenon was particularly common in older children and adolescents in secondary schools. The disease was quickly dubbed "Go-Slow Malaria" and various hypotheses put forward. Two clear points have so far emerged, namely: (i) delayed clearance of parasites and rapid reappearance of parasitaemia after earlier clearance, and (ii) persistence of pyrexia and clinical symptoms after peripheral parasite clearance. The delayed clearance and reappearance of parasites may be related to a reduction of parasite sensitivity to

chloroquine. It is worth noting that parasite clearance per se is also dependent on the host's immunity and leucocyte phagocytosis. Acute malaria in children has been shown to cause immunosuppression in children,[10] while chloroquine itself is not infrequently employed as an immunosuppressive agent in collagen disorders.

A recent prospective study of 14 children, between the ages 4 and 10 years, presenting with persistent pyrexia after parasite clearance with chloroquine alone or chloroquine followed by amodiaquine have confirmed gram negative septicaemia as the cause of the pyrexia, responding to seven to ten day courses of chloramphenicol. Salmonella species other than S. typhi were isolated in 7 blood samples. The rest were proteus (1) and acinetobacter species (1).[11] Four survivors among the five remaining patients whose cultures yielded no organisms in their blood, urine or cerebrospinal fluid achieved clinical response and resolution of pyrexia in much the same manner as the patients with positive culture when treated with the same antibiotic regime. The clear message from our experiences is that where fever or parasitaemia persists or there is no clinical response after 72 hours of treatment, the expected considerations must include other issues than chloroquine-resistant strains of parasites. Gram negative septicaemia is a more frequent complication than perhaps has previously been imagined.

The Cerebral Type

Cerebral vascular occlusions lead to the "cerebral malaria syndrome" where patients often with confirmed parasitaemia" display signs of cerebral dysfunction which are not readily explained by severe hyperpyrexia, detectable metabolic abnormalities or other intracranial insults. The clinical syndromes are varied and almost every neurological signs and symptom has been described. Most cases can be broadly divided into five groupings:

(a) disturbances of consciousness

(b) acute organic mental syndrome

(c) movement disorders

(d) focal neurological signs

(e) acute personality changes.

A most encouraging and probably diagnostic feature of the cerebral malaria syndrome is the completely reversible nature of the clinical manifestations, whatever their exact nature and pathophysiological basis.

In Accra the common clinical presentations have been convulsions, delirium, hyperpyrexia, and coma. Less commonly observed are acute hemiplegias, acute insurbodination, disorientation, aphasia and sleep disturbances. A transient early post-recovery ataxic syndrome is seen frequently. This has been referred to popularly as "Nkrumah's ataxia" after one of the illustrious senior collegues in our centre who called our attention to this rather common but apparently unreported and unexplained clinical feature. We have also recently noted the occurence of acute rigidity syndromes and movement disorders - notably; choreiform movement, limb myoclonus and non-intentional hand tremors worsened by activity. These have often occured in children with multiple convulsions and/or persistent pyrexia even after parasite clearance. All these transient phenomena have resolved within three to six months after the acute illness.

The Gastrointestinal Type

Blockage of the splanchnic capillaries leads to vomiting, diarrhoea, abdominal pain or melaena. The vomiting tends to be persistent and irregular without much retching, leading to the common diagnosis of acute gastritis or dyspepsia. Accompanying fever is usually mild or absent; parasitaemia is heavy and the symptoms are cleared with antimalarials. Malarial diarrhoea may be simple with colicky abdominal pains of varying intensity; but it is more commonly continuous or recurrent on alternate days. The stools are watery and non-mucous with stool microscopy often showing only few red blood and pus cells.

Less common presentations include:

(a) diarrhoea of sudden onset with blood and mucus in the stool, often accompanied by moderately severe abdominal pains and medium-grade pyrexia. Such diarrhoea tends to be profuse and distressing with over thirty motions per day, resembling acute bacillary and/or amoebic dysentery, themselves fairly common disorders of the sub-region; and

(b) Severe abdominal pains localised to the right lower abdomen mimicking acute appendicitis with accompanying leucopenia rather than leucocytosis.

The Pulmonary Type

Pulmonary circulation involvement may lead to persistent troublesome cough with blood-streaked sputum, rales and rhonchi on chest auscultation and accompanying fever of considerable intensity and variability. Such presentation is suggestive of bronchitis bronchopneumonia or other lung dieases. The diagnosis is dependent on the negative chest radiograph and the satiafactory response to antimalarials. Pulmonary oedema has been reported infrequently in severe infections, particularly fatal ones, and may be secondary to iatrogenic fluid overflood or complicating acute renal failure.

Black Water Fever (Intravascular haemolysis)

Though often classifield as one of the pernicious complications of falciparum malaria, its aetiology is still obscure. In many patients parasitaemia is absent at the time haemolysis occurs. Notable past and present predisposing associations include confirmed residence in hyperendemic areas and irregular and partial treatment with quinine and or other antimalarials (although the condition can and actually occurs in patients not given drugs).

Classical black water fever beginning with rigors and fever followed by massive intravascular haemolysis, icterus, severe anaemia, haemoglobinuria, collapse and occasionally renal failure is considered to be more common in non-immune adults and less "classical" condition are frequently referred to our centre for urgent blood transfusion. Over the past six years or so we have infrequently seen children and occasionally adults with recurrent episodes of fairly severe intravascular haemolysis without significantly associated pyrexia or constitutional symptoms. Many of these patients have had moderate elevation of their erythrocyte sedimentation rate and have responded to corticosteroid treatement with maintenance of haemoglobin levels over many months.

Review of the "old" literature on malaria revealed previous notation that 70 to 80% of patients surviving a black water fever episode, were likely to experience haemolytic episodes with subsequent malarial infections.

Miscellanous Group

(i) Anaemia

Severe anaemia is a frequently encountered complications of malaria in the pre-school child in Ghana. Indeed malarial anaemia constitutes the commonest single cause of severe anaemia during the first three years of life [12,13]. In most cases the degree of anaemia subsequent to the malaria infection is generally out of proportion to the parasitaemia level and indeed the anaemia often occurs when parasitaemia has almost disappeared.[14]

(ii) Acute Nephritis

An acute transient, probably immune complex glomerulopathy with nephritic features is seen infrequently in acute malarial infections, responding quickly to antimalarial therapy with subsequent full recovery the rule.

(iii) Extention of Tuberculous Foci

Tuberculous foci in infants and young children have been noted to extend after conditions commonly associated with immunosuppression such as measles, pertussis and protein calorie malnutrition. In recent months we have noted a significant increase in the incidence of slowly

resolving pneumonias in children after recurrent or protracted episodes of malaria. Many of these children who are often border-line malnourished usually test negative to tuberculoprotein and have indefinite changes in their chest radiographs. They invariably have a good clinical response to conventional anti-tuberculous treatment with significant weight gain and improvement of affect and physical activity. Extensive tuberculous infection is not uncommonly discoverd in the few fatal cases.

(iv) Algid malaria presenting with circulatory collapse associated with high mortality is very infrequent in children and now only rarely reported even in adults.

CONCUSION

It is impossible to present a clinical description of falciparum infection which will cover all its manifestations. As far back as 1831 Borle [15] wrote this about Western African malaria: "the symptons of this fever, it is to be regretted, are so various and irregular, in different cases and under different circumstances that a mere nosological definition of them afford no precise information and might mislead those it was intended to instruct". Nearly two centuries after this significant statement the diversity of the manifestations of malaria seems to have seen little change. Modern authors have tended to emphasize the severer and rarer forms of the disease to the exclusion of its commoner and milder, though no less protean forms.

The diagnosis of malaria can be made only if it kept in mind and if suitable steps are taken to confirm it.

REFERENCES

1. Bruce-Chwatt LT. *Some aspects of malaria and its control.* Trop. Doctor.1971; 147-153.

2. Nkrumah F. K. *Malaria in Children.* Ghana Med. J. 1977; 16: 283-287.

3. Commey J. O. O, Mills-Tettey D, Phillips, B. J. *Cerebral Malaria in Accra,* Ghana. Ghana Med. J. 1980; 19: 68-72.

4. Gardiner C, Bigger R.J, Collins W. E., Nkrumah F. K. *Malaria in urban and rural areas of southern Ghana; a survey of parasitaemia, antibodies and antimalarial practices.* Bull. Wld. Health Org. 1984; 62: 607-613.

5. Harland PSEDG, Frood J. D. L., Parkin J. M. *Some effects of partial malarial suppression in Ugandan children during the first three years of life.* Trans. Roy. Soc. Trop. Med. 1975; 69: 261-262.

6. Ofori-Adjei D. (Personal Communication).

7. Bagster W. D. *Malaria in the African.* Central Afr. J. Med. 1958; 4: 73-77.

8. Edington G. M. *Cerebral Malaria in the Gold Coast African: four autopsy reports.* Ann. Trop. Med. Parasitol. 1954; 48: 300-306.

9. Lindsay D. K. *Guidance Notes on Pernicious Malaria.* Trans. Roy. Soc. Trop. Med. Hyg. 1943; 37, 63.

10. Greenwood B. M., Bradley-Moore A. M., Palit A, Bryceson A. D. M. *Immunosuppression in children with malaria.* Lancet, 1972; 1: 169-172.

11. Commey J. O. O., et al (unpublished date).

12. Hendrickse R. G. *Anaemia in children in West Africa.* Ghana. Med. J. 1964; 2: 124-128.

13. Jilly P, Nkrumah F. K. *A survey of anaemia in children in the Korle bu Hospital with special refernce to Malaria.* Ghana Med. J. 1964; 3: 118-124.

14. Nkrumah F. K. *Severe anaemia associated with malaria in children.* Ghana Med. H. 1973; 12: 17-21.

15. Boyle J. A *Practical Medico-historical Account of the Western Coast of Africa,* London 1831; p. 127, quoted by Hughes S. B. and Bomford R. R. Brit Med. J. 1944; 1: 69-73.