

## Kawasaki disease in a Papua New Guinean child: the first recorded case

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### Introduction

Kawasaki disease, first reported more than 25 years ago in Japan (1), is the result of a multisystem vasculitis which is almost certainly of infectious aetiology - although the infective agent remains to be identified. It is more common in oriental children than in caucasians, in whom the incidence is 3.4 per 100,000, with Afro-Americans having an intermediate incidence. The majority of children are less than 4 years of age, the peak incidence is at the end of the first year of life, and boys are more commonly affected than girls (2,3). Though a caucasian patient who grew up and lived in Goroka has been reported with Kawasaki disease (4), this is the first report, as far as we are aware, of the disease in a Papua New Guinean child.

### Case Report

A five-year-old boy from Marshall Lagoon in the Central Province was admitted to the Port Moresby General Hospital Children's Ward in June 1996 with a history of vomiting, cough, dyspnoea, peeling skin and sore mouth.

He had a history of convulsions, the last one occurring about 2 months previously, and was on treatment with phenobarbitone and prophylactic antimalarials. He had been fully immunized, including two doses of measles vaccine at the ages of 8 months and 23 months. Three weeks before his admission he had developed cough and fever, and a diagnosis of mild pneumonia and otitis media had been made. The haemoglobin level at that time was 10.2 g/dl, white cell count (WCC) 10,400/ $\mu$ l

and platelets 182,000/ $\mu$ l. He was commenced on an antibiotic (almost certainly amoxycillin) and three days later he developed an erythematous maculopapular rash. The possibility of a drug reaction was raised - as was that of measles. It was suggested that he should stop the amoxycillin. Vitamin A was administered and recommendation was made for admission. However, the ward being full, he was instead seen the following day. Measles was felt to be the most likely diagnosis and the amoxycillin was continued.

One week later, on review at the consultation clinic, the rash was still present and marked palmar erythema was noted. Since he was otherwise not desperately ill outpatient review was advised and he returned the following week. At this point not only were the rash and palmar erythema persistent, but he also had dyspnoea and cough. The possibility of Kawasaki syndrome was entertained and he was admitted to the ward.

On admission he was febrile, was covered in a desquamating rash and had angular stomatitis, glossitis and a sore and erythematous mouth. He had moderate nonexudative conjunctivitis. His palms and soles were markedly erythematous and thickened, and felt oedematous (Figures 1-2). His respiratory rate was increased and he had bilateral chest crepitations. Haemoglobin level was 11.8 g/dl with a mean cell volume (MCV) of 70 fl, mean cell haemoglobin (MCH) of 21 pg and mean cell haemoglobin concentration (MCHC) of 30 g/dl; a blood film showed anisopoikilocytes, mild polychromasia and microcytic red cells. His white cell count was

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21,600/ $\mu$ l and platelets 462,000/ $\mu$ l. Chest X-ray showed nonspecific perihilar increased markings. Blood culture was negative, as was a blood slide for malaria parasites.

He was commenced on cloxacillin, to cover the possibility of post-measles staphylococcal pneumonia, chloramphenicol and saline mouth washes. The following day he developed inspiratory stridor and became more tachypnoeic. Five days after admission, and still febrile, he became obviously more dyspnoeic. A repeat chest X-ray showed a poorly demarcated fluffy infiltrate in the right lung and changes in the left lower lobe (Figure 3). His WCC had dropped to 14,800/ $\mu$ l and his erythrocyte sedimentation rate (ESR) was reported as 8 mm/hour. Liver function tests were normal apart from a mild elevation of serum bilirubin (24.8  $\mu$ mol/l). An electrocardiogram (ECG) revealed normal sinus rhythm, no evidence of ischaemia and mild electrical alternans. Antituberculous treatment was started, as was aspirin, in a dose of 30 mg/kg, subsequently increased to 40 mg/kg. With the detection of widespread rhonchi, salbutamol was administered by nebuliser with some improvement. His haemoglobin level fell

to 7.2 g/dl 11 days after admission.

Over the next week or so there was a slow improvement in his condition. The angular stomatitis improved. Intermittent fever and intermittent bronchospasm, however, persisted and his skin developed a 'sandpaper texture'.

At this stage echocardiographic assessment showed no evidence of aneurysm in the right or left coronary artery and no sign of endocarditis, myocarditis or pericarditis.

Fifteen days after admission he developed a recurrence of the generalized, erythematous maculopapular rash. Antituberculous drugs and cloxacillin were stopped. There was no major improvement in the rash over the next 5 days and antituberculous treatment was restarted, only to be stopped following a review of his chest X-rays, which had shown complete resolution of the previous changes within a period of five days. Chloramphenicol was discontinued 20 days after admission and aspirin 24 days after admission.

By 25 days after admission the recrudescing rash was desquamating, he had a serous



Figure 1. Marked angular stomatitis.

discharge from both ears, his chest signs had improved considerably and his temperature was normal. The palmar and plantar changes had almost completely resolved and he was discharged on phenobarbitone, zinc cream and pinetar skin washes. Over the next two weeks the changes resolved completely, with no recurrence of the rash, and there was no further follow-up.

### Discussion

This patient presented with considerable diagnostic difficulty. The initial differential diagnosis was between a severe drug reaction and measles. Clinical features of both were certainly present. His inspiratory stridor was compatible with measles, but the longevity of his signs and symptoms and recrudescence of the rash was not. In addition he had had two doses of measles vaccine in early life. The very striking palmar and plantar erythema and oedema made the possibility of a serious drug reaction unlikely as did the time course of the rash, the recrudescence and the fact that he was never desperately ill. The features of his illness are all completely compatible with the

diagnosis of Kawasaki disease - otherwise known as mucocutaneous lymph-node syndrome.

Clearly defined criteria for the diagnosis of Kawasaki disease have been formulated (5) and are as follows:

- a) Fever of 5 or more days duration
- b) Presence of four of the following five conditions:
  1. Bilateral nonpurulent conjunctival injection
  2. Changes in the mucous membranes and upper respiratory tract such as injected pharynx, dry cracked lips, strawberry tongue
  3. Changes in the peripheral extremities including oedema, erythema, desquamation (may occur later)
  4. Polymorphous rash



Figure 2. Thickened, erythematous, 'oedematous' and peeling palms and soles.

## 5. Cervical lymphadenopathy

- c) Exclusion of staphylococcal and streptococcal infection, measles, leptospirosis, rickettsial disease, juvenile rheumatoid arthritis, etc

In the presence of echocardiographically detected coronary aneurysms, a) plus three of the criteria in b) is sufficient to establish the diagnosis.

Our patient quite clearly had a) and four of the five criteria in b). There was no evidence of staphylococcal infection, blood culture was negative, and measles was extremely unlikely for the reasons already discussed. Antistreptococcal titres were unfortunately not measured.

Cervical lymphadenopathy was not a feature of our patient but further clinical support for the diagnosis lay in the characteristics of the fever, which was spiking in nature and persisted intermittently for about 4 weeks, and the rash, which desquamated 10-20 days after the onset of fever, and which recrudesced. Normochromic normocytic anaemia is a characteristic feature of Kawasaki disease. A fall in haemoglobin from 11.8 on admission to 7.2 g/dl 11 days later in our patient was therefore consistent, although there was evidence of microcytosis and some hypochromasia, possibly reflecting an underlying iron deficiency. The platelet count of 462,000/ $\mu$ l on admission was consistent with a thrombocytosis, which may occur in the subacute phase of the disease. Mild elevation of the serum bilirubin (24.8  $\mu$ mol/l) was also consistent with the mild hepatic involvement which may be a feature of the disease. Erythrocyte sedimentation rate and other acute phase reactants are usually but not always elevated in patients with Kawasaki disease. Normal ESRs were present in 2 of 7 patients recently reported from Malaysia (6). Our patient's ESR of 8 mm/hour is therefore not inconsistent.

The vasculitis of Kawasaki disease has been reported to involve the coronary arteries, resulting in coronary artery dilatation or aneurysm, coronary stenosis, myocardial infarction or valvular lesions, in up to 30% of affected children and causing death in up to 3.7% (7-9). Kawasaki disease is now

recognized as one of the commonest - if not the most common - cause of acquired heart disease of children in western countries. There was no electrocardiographic or echocardiographic evidence of coronary artery involvement in our patient.

Although clinically significant lung involvement is not a feature in the classic presentation of Kawasaki disease, pulmonary infiltrate is included in the description of other significant clinical and laboratory findings (5). Pneumonia - or pneumonitis - has been reported in Malaysian (6) and American (10) children. We propose that the respiratory findings in our patient and the rapidly developing and resolving infiltrates seen on the chest X-ray were the result of the underlying disease process. Other reported features of Kawasaki disease have included arthritis, arthralgia, diarrhoea, vomiting, abdominal pain, ileus, hydrops of the gall bladder, sterile pyuria, meningitis/encephalitis and nerve palsies.



Figure 3. Poorly demarcated, transient, pulmonary infiltrates.

Early diagnosis of Kawasaki disease is important, since it has been clearly shown that intravenous immunoglobulin given within the first 10 days of the illness (best given as a single bolus of 2 g/kg) greatly reduces the risk of coronary artery aneurysms (11). High-dose aspirin (30-80 mg/kg/day) is also recommended during the early stage of the disease, with low 'antiplatelet' doses (3-5 mg/kg/day) continuing after the subsiding of the fever (3,12). Since aneurysms may occur some time after the acute presentation, patients with Kawasaki disease should have cardiological assessment at around 6 weeks. Low-dose aspirin should be continued if abnormalities are detected. Other therapies which have been used in children with severe involvement of the coronary arteries include dipyridamole and prostacyclin as additional antiplatelet agents, anticoagulation with heparin or warfarin and thrombolytic therapy with streptokinase for those with impending or actual coronary thrombosis or severe peripheral artery ischaemia. Steroids are not routinely used.

Although we believe this to be the first recorded case of Kawasaki disease in a Papua New Guinean child it is highly likely that previous cases have been missed. It is important that those working with children are aware of the disease, since early treatment may be lifesaving. Although intravenous immunoglobulin is not routinely available it may be possible to obtain it, and aspirin can and should be given.

#### ACKNOWLEDGEMENT

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