ScientificScholar®
Knowledge is power
Publisher of Scientific Journals

www.c-jhs.com

Calabar Journal of Health Sciences

Case Report

Kawasaki disease; rare; or misdiagnosed: A case report in a tertiary hospital in Nigeria

Callistus Achuri Okwuchukwu Enyuma[1], Anthony Chimereze Amajor[1], Enobong Ufot Akpah[2], Ekaete Samuel Brown-Abang[2]

[1]Department of Paediatrics, University of Calabar, [2]Department of Paediatrics, University of Calabar Teaching Hospital, Calabar, Cross River, Nigeria.

***Corresponding author:**
Callistus Achuri Okwuchukwu Enyuma,
Department of Paediatrics, University of Calabar, Calabar, Cross River, Nigeria.

drcarlenyuma@yahoo.com

Received : 22 June 2020
Accepted : 27 March 2021
Published : 30 June 2021

DOI
10.25259/CJHS_30_2020

Quick Response Code:

ABSTRACT

Kawasaki disease (KD) is a self-limiting, acute febrile vasculitis with predilection for children under-5 years. Most reports have emanated from Japan with only a few cases reported in Africa. KD presents a diagnostic dilemma and a high index of suspicion is critical as early treatment reduces the incidence of complications. We describe a 5-month-old male infant who presented with classical clinical features though with delayed diagnosis. Received moderate dose aspirin with limitation of access to intravenous immunoglobulin and who did not develop coronary artery complication. The case report highlights the diagnostic challenges faced by practitioners, made worse by the low index of suspicion inherent in our setting. The fatal complications that may be associated with KD can, therefore, be avoided. It is hoped that pediatricians in particular would become conversant with the diagnostic criteria to facilitate early diagnosis and intervention in children.

Keywords: Kawasaki disease, Children, Coronary artery complications, Calabar, Nigeria

INTRODUCTION

Kawasaki disease (KD) is self-limiting acute febrile vasculitis with predilection among the under-5 years old.[1] Although first described in the Japanese population in 1967 by Dr. Tomisaku Kawasaki, the epidemiology of KD has not been well researched nor commonly reported in Africa,[2,3] first reported in the Côte d Ívoire in 1981.[2] The peak age of onset is 6–11 months with the highest incidence rate of 239/100,000 in Japan[4] and lowest of 3.7/ 100,000 in Australia amongst children <5 years of age.[1,5] The condition occurs more commonly in boys without a strict seasonal variations though more cases are seen in cold periods.[6]

The cause of KD remains unclear although infection, inflammatory changes as well as genetics have been considered.[6] The natural history of KD is characterized by complete resolution within 2 weeks.[2] Notwithstanding, KD may progress to aneurysms, stenosis and or thrombosis in the coronary vessels as well as heart failure, myocardial infarction, or sudden death.[2,7]

A criterion based clinical case definition for KD has been in place.[8] These include fever for at least 5 days in addition to four or more of the following; (1) non-exudative conjunctival injection; (2) strawberry tongue, mucosal hyperemia, and cracked or erythematous lips; (3) cervical lymphadenopathy; (4) polymorphous rash; and (5) initial stage erythema and edema while

desquamation in convalescence stage in the extremities. Despite this, KD still presents a diagnostic dilemma to the physician; this is because there are no clinical presentation nor laboratory investigations that are pathognomonic.

A high index of suspicion is critical as early commencement of treatment with intravenous immunoglobulin (IVIG) and high-dose aspirin reduces the incidence of cardiac complication from 25% to 4%.[8,9]

With paucity of cases reported from our region and the seriousness of the complications of KD, we present the rare occurrence in our center.

CASE REPORT

A 5-month-old male was presented with a 9 days history of fever, of neck swelling of 7 days, with body rashes which appeared first on the face and became generalized within 24 h. There was no history of seizures. Mother had observed redness of the eyes, mouth, and tongue with painful ulcers [Figure 1] about 4 days into the illness. There were also, redness/swelling of the palms and soles of the feet [Figures 2 and 3]. The rash resolved spontaneously leaving no spots. Mother administered gentamycin eye drops, syrup Ibuprofen and antimalarial with no relief of the symptoms. She then presented child to the Children Emergency Room.

On examination, baby was acutely ill-looking, febrile and irritable, with cracked lips, and hyperemic buccal mucosa. The neck was held in hyper extended position with a tender enlarged left submandibular lymph node measuring 3 × 2 cm, the extremities were edematous. ENT exam revealed a hyperemic Pharynx and tonsils which was slightly enlarged. With a respiratory rate of 56 cycles/min, other respiratory and digestive system findings were unremarkable. Pulse was 120 beats/min, full volume regular. On precordial auscultation only S1and S2 heart sounds were heard. Initial diagnosis of Keratopharyngotonsilitis was made. Child was admitted and commenced on 6 hourly Intravenous crystalline penicillin for 24 h then changed to Ceftriaxone in addition to Gentamycin for 48 h which could not defervesce the fever. On further review of the child, all the limbs were tender and held in flexion (arthralgia) but there was no history of a red currant jelly stools, nor finding of a sausage-shaped abdominal mass. Abdominal USS findings were normal while result of FBC revealed leukocytosis (22 × 10^3/ul) thrombocytosis (520 × 10^3/ul), elevated erythrocyte sedimentation rate (80 mm/h), and mild anemia (PCV 25%). Urinalysis, electrocardiogram, and echocardiography were normal. Results of throat swab, urine, and blood culture were not suggestive of bacterial infection.

Consequently a diagnosis of Kawasaki's diseases was made because index patient had using fever of more than 5 days in addition to (1) bilateral non-supportive conjunctival injection, (2) dry fissured lips, and red tongue, (3) edema and redness of extremities, (4) maculopapular desquamating

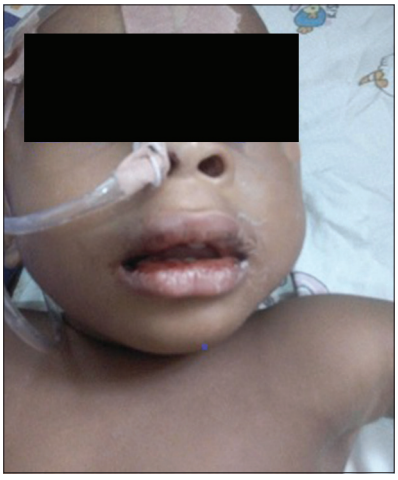

Figure 1: Patient's face. Note acutely ill, fissures of the lips, and inflammation of the oral cavity.

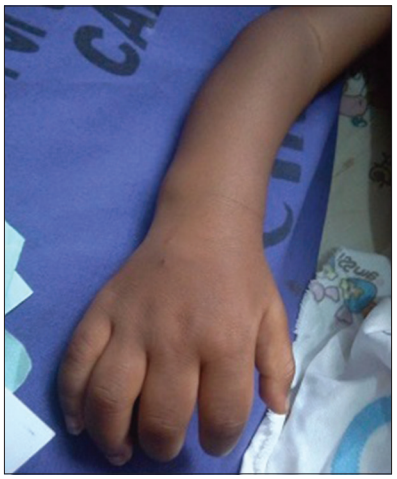

Figure 2: Patient's hand. Note the oedema and redness.

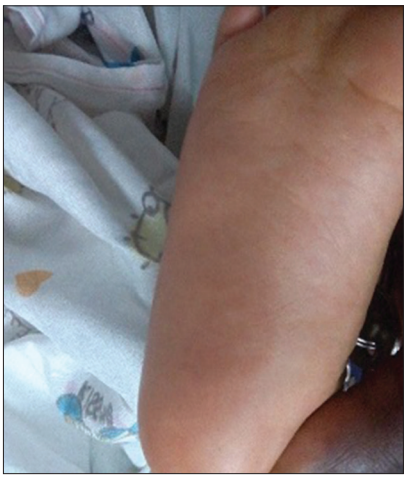

Figure 3: Patient's foot. Note induration and redness.

rash, and (5) right-sided cervical lymphadenopathy. In view of the risk of Reye's syndrome, lower dose acetylsalicylic acid (50 mg/kg) was used. Fever subsided and the pain of arthralgia was also relieved all within 3 days. The dose was then adjusted to on 3 mg/kg/day. IVIG was not available and not administered.

Repeat investigation after 1 week of treatment showed marked improvement (WBC = 6 × 10^3/ul; ESR = 12 mm/h; Platelets = 200 × 10^3/ul). Patient was then discharged home on the 3 mg/kg/day of acetylsalicylic acid. On follow-up in pediatric cardiology clinic a repeat Echocardiogram 1 month after was still normal [Figures 4 and 5].

DISCUSSION

KD, though a common condition among the populations in Japan, Taiwan, and Korea but is now increasingly documented worldwide.[4] Several case reports have been published from areas where it has hitherto been uncommon and in different age groups. Kara *et al*.[10] reported KD in a 30 days old Turkish female. Furthermore, KD has been documented in a 36-year-old white male in Houston.[11] Therefore, KD should be considered in all ages and races.

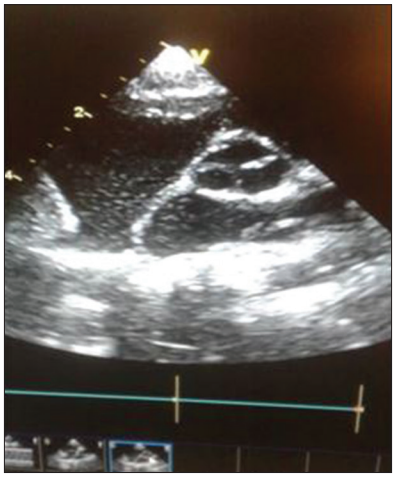

Figure 4: Echo findings – parasternal short axis view showing the aortic root and appearance of the aortic valve resembling the Mercedes star.

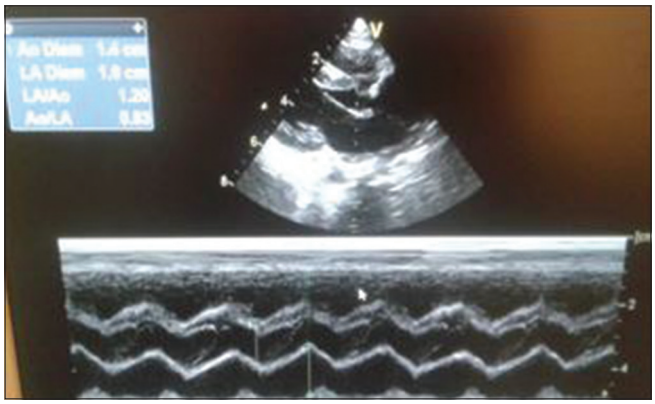

Figure 5: Echo findings – parasternal long axis view showing normal aortic root diameter.

Etiology of KD remains unclear with the likelihood of an unidentified infectious pathogen based on the clinical and immunological similarity between KD and staphylococcal and streptococcal superantigen mediated disorders.[12] Furthermore, because of the high prevalence of KD among the Asian race, its persistence even on migration, and several genetic studies, a genome wide association studies has been advocated to have the advantage of identifying disease-associated genes. Several single nucleotide polymorphisms associated with susceptibility to KD has been implicated and includes; ITPKC (inositol 1,4,5-trisphosphate 3-kinase C), ABCC4 (ATP-binding cassette, subfamily C, member 4), FCGR2A (Fc region receptor II-a), CD40 (expressed on the surface of CD4 T-cells and platelets), and a gene region near FAM167A-BLK (associated with several autoimmune diseases and BLK encodes B-lymphoid tyrosine kinase.[13,14] However, genetic contribution to the etiology of KD remains a field for further research.

Diagnosis of KD in most of the Low-and Middle-Income Countries is fraught with difficulties as the prevalent infectious diseases mimic KD. Diagnostic criteria have been used in the diagnosis of KD and include the Japanese working guidelines and also the American Heart Association guidelines[15] that went further to classify KD as typical and atypical.

In the typical KD, the clinical features evolve with fever at the onset, during the acute phase. This is followed by the non-purulent bilateral redness of the conjunctiva. Thereafter changes appear in the mouth (red and cracking lips, reddish tongue [strawberry tongue]) which precedes the one-sided cervical lymphadenopathy (one node >1.5 cm in diameter) and then polymorphous rashes appear within 5 days of fever onset. There are also changes in the limbs (extremities) (induration and or erythema of the palms and sole of the feet). About 3 weeks after onset, there may be desquamation of the fingers and toes which heralds the sub-acute phase. Other systemic manifestations which may occur in KD but not part of the diagnostic criteria are rheumatologic (joint pain and swelling), respiratory (cough and rhinorrhea), and gastrointestinal (vomiting/diarrhea and abdominal pain).[15]

KD is considered atypical when there is fever for ≥5 days with only ≥2 diagnostic clinical features. This form is more common in extremes of childhood. Hence, in children below 6 months who has fever lasting for 5 days or more with raised acute phase reactants, this echocardiography is advised.[15]

Our patient was diagnosed using these criteria of fever of more than 5 days in addition to (1) bilateral non-supportive conjunctival injection, (2) dry fissured lips, and red tongue,

(3) edema and redness of extremities, (4) maculopapular desquamating rash, and (5) right-sided cervical lymphadenopathy.

Early diagnosis is critical as it guides the clinician to initiate prompt and directed treatment which invariably prevents development of complication(s).[16] Treatment of KD involves the use of IVIG and high-dose aspirin.[8,9,17,18] The use of IVIG in combination with corticosteroids which synergistically has been found to significantly reduce the incidence of complications.[16] As a monotherapy and at a dose of 2 g/kg stat, IVIG has a significant anti-inflammatory effect on the condition while also reducing the risk of coronary artery aneurysm if used in the acute phase.[16] Although the mechanism remains unclear, the effect of IVIG may be from its modulatory action on cytokine production, its influence on T-cell activity, and suppression of antibody synthesis.[18] Unfortunately, IVIG was not used in the index patient because it was not readily available in our center.

High dose aspirin (80–100 mg/kg/day orally divided into four doses) preferably given within the acute phase and continued for 14 days or until patient is afebrile for 48–72 h provides an anti-inflammatory activity, while the continuation low-dose aspirin of 3–5 mg/kg/day over 6–8 week provides an antithrombotic effects.[19] Our patient received a modified acute phase dose of aspirin which is in keeping with a study in the UK.[20] It is advised that patients on long-term aspirin receive influenza and varicella vaccination as it protects the patient from these infections.

Complications of KD include carditis (myocarditis and pericarditis), congestive heart failure, coronary arteritis, and sudden death.[8,18] Our patient did not have coronary artery complication as shown in echocardiography which is a good prognostic factor.[8,18] About 20–30% of patient will eventually develop coronary aneurysm if not treated while treatment with IVIG reduces this risk to 3–5%.[8,18] The index patient was followed up in the pediatric cardiology clinic with repeat echocardiography which still showed normal findings.

CONCLUSION

The case report highlights the diagnostic challenges faced by practitioners, made worse by the low index of suspicion inherent in our setting. The fatal complications that may be associated with KD can, therefore, be avoided. It is hoped that pediatricians in particular would become conversant with the diagnostic criteria to facilitate early diagnosis and intervention in children.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Yim D, Curtis N, Cheung M, Burgner D. Update on Kawasaki disease: Epidemiology, aetiology and pathogenesis. J Paediatr Child Health 2013;49:704-8.
2. Noorani M, Lakhani N. Kawasaki disease: Two case reports from the Aga Khan Hospital, Dar es Salaam-Tanzania. BMC Pediatr 2018;18:334.
3. Boudiaf H, Achir M. The clinical profile of Kawasaki disease in algerian children: A single institution experience. J Trop Pediatr 2016;62:139-43.
4. Nakamura Y, Yashiro M, Uehara R, Sadakane A, Tsuboi S, Aoyama Y, *et al*. Epidemiologic features of Kawasaki disease in Japan: Results of the 2009-2010 nationwide survey. J Epidemiol 2012;22:216-21.
5. Royle JA, Williams K, Elliott E, Sholler G, Nolan T, Allen R, *et al*. Kawasaki disease in Australia, 1993-95. Arch Dis Child 1998;78:33-9.
6. Rowley AH, Shulman ST. The epidemiology and pathogenesis of Kawasaki disease. Front Pediatr 2018;6:374.
7. Terai M, Shulman ST. Prevalence of coronary artery abnormalities in Kawasaki disease is highly dependent on gamma globulin dose but independent of salicylate dose. J Pediatr 1997;131:888-93.
8. JCS Joint Working Group. Guidelines for diagnosis and management of cardiovascular sequelae in Kawasaki disease (JCS 2008)-digest version. Circ J 2010;74:1989-2020.
9. Eleftheriou D, Levin M, Shingadia D, Tulloh R, Klein NJ, Brogan PA. Management of Kawasaki disease. Arch Dis Child 2014;99:74-83.
10. Kara A, Tezer H, Devrim I, Korkmaz EK, Karagoz T, Ozer S, *et al*. Kawasaki disease: A case report in extreme of pediatrics. Infect Dis Clin Pract 2006;14:333-4.
11. Rozo JC, Jefferies JL, Eidem BW, Cook PJ. Kawasaki disease in the adult: A case report and review of the literature. Tex Heart Inst J 2004;31:160-4.
12. Yeung RS. Kawasaki disease: Update on pathogenesis. Curr Opin Rheumatol 2010;22:551-60.
13. Burgner D, Davila S, Breunis WB, Ng SB, Li Y, Bonnard C, *et al*. A genome-wide association study identifies novel and functionally related susceptibility loci for Kawasaki disease. PLoS Genet 2009;5:e1000319.
14. Onouchi Y, Ozaki K, Burns JC, Shimizu C, Terai M, Hamada H, *et al*. A genome-wide association study identifies three new risk loci for Kawasaki disease. Nat Genet 2012;44:517-21.
15. American Heart Association. Diagnostic Guidelines for Kawasaki Disease: Council on Cardiovascular Disease in the Young, Committee on Rheumatic Fever, Endocarditis, and Kawasaki Disease. United States: American Heart Association; 2001.

16. Robert Sundel. Kawasaki Disease: Clinical Features and Diagnosis-UpToDate; 2019. Available from: https://www.uptodate.com/contents/kawasaki-disease-clinical-features-and-diagnosis. [Last accessed on 2019 Aug 10].
17. Saguil A, Fargo M, Grogan S, Eisenhower DD. Diagnosis and management of Kawasaki disease. Am Fam Physician 2015;91:365-71.
18. Newburger JW, Takahashi M, Gerber MA, Gewitz MH, Tani LY, Burns JC, *et al*. Diagnosis, treatment, and long-term management of Kawasaki disease. Circulation 2004;110:2747-71.
19. Chen S, Dong Y, Yin Y, Krucoff MW. Intravenous immunoglobulin plus corticosteroid to prevent coronary artery abnormalities in Kawasaki disease: A meta-analysis. Heart 2013;99:76-82.
20. Brogan PA, Bose A, Burgner D, Shingadia D, Tulloh R, Michie C, *et al*. Kawasaki disease: An evidence based approach to diagnosis, treatment, and proposals for future research. Arch Dis Child 2002;86:286-90.

How to cite this article: Enyuma CA, Amajor AC, Akpah EU, Brown-Abang ES. Kawasaki disease; rare or misdiagnosed: A case report in a tertiary hospital in Nigeria. Calabar J Health Sci 2021;5(1):35-9.