ATYPICAL KAWASAKI DISEASE- DILATATION OF ASCENDING AORTA AND PERIPHERAL GANGRENE

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ABSTRACT

BACKGROUND

The aetiology of Kawasaki disease is still unknown and no single pathognomonic clinical or laboratory finding for the diagnosis has been identified. However, paediatricians sometimes encounter febrile children who do not fulfil all the diagnostic criteria prepared by the Japanese Kawasaki Disease Research Committee 2 or the American Heart Association (AHA), but have several findings compatible with those of Kawasaki disease. In this situation, the diagnosis of incomplete or atypical Kawasaki disease is made.

KEYWORDS

Atypical Kawasaki Disease, Dilatation of Ascending Aorta, Peripheral Gangrene, IV IgG.

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BACKGROUND

Kawasaki disease is an acute, self-limited systemic vasculitis that occurs predominantly in young children first reported by Tomisaku Kawasaki in Japan.[1] It is now recognised as one of the leading cause of acquired heart disease in children in developed countries. The aetiology of Kawasaki disease is still unknown and no single pathognomonic clinical or laboratory feature for the diagnosis has been identified. However, paediatricians sometimes encounter febrile children who do not fulfil all the diagnostic criteria prepared by the Japanese Kawasaki Disease Research Committee[2] or the American Heart Association (AHA),[3] but have several findings compatible with those of Kawasaki disease. In this situation, the diagnosis of "incomplete" or "atypical Kawasaki disease" is a clinical challenge, which should not be avoided by delaying the diagnosis because of the risk of coronary complications pertaining even to the incomplete presentation of the disease. Thus recently, the term "atypical Kawasaki disease" has been used to describe patients with incomplete presentation of the disease, regardless of the presence of coronary complications[4,5] and is exchangeable for "incomplete Kawasaki disease."[2,6,7,8,9] Malekzadeh et al[6] reported three infants with prolonged (>5 days) fever and peripheral gangrene without any other clinical manifestations of Kawasaki disease.[6] The diagnosis of incomplete Kawasaki disease might be made in cases with fewer classical diagnostic criteria and with several compatible clinical, laboratory or echocardiographic findings, excluding those of other febrile illnesses.[10] Recently, we came across a patient of atypical Kawasaki with dilatation of ascending aorta and peripheral gangrene. We want to report our case because of rarity.

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CASE REPORT

A four years old male child was admitted with complaints of high-grade fever for 7 days with gangrene of left side of lower lip and left index finger. The examination revealed no lymphadenopathy, conjunctivitis, skin rashes and periungual desquamation. His investigation revealed total leucocyte count 38,000/cumm, neutrophil 40% and platelets 7,27,000/mm^3, ESR 50 mm after one hour, CRP 60 mg/L, negative ASLO, haemoglobin 6 gm%, albumin 2 gm%, SGPT 450 IU, urine 20 WBC/HPF, blood and urine culture was sterile, normal serum immunoglobulin -IgG, A, M, absent anti-phospholipid antibodies and anti-neutrophil cytoplasmic antibodies and positive antinuclear antibody test. The patient showed rise in ESR and CRP values on serial testing and were 100 mm after one hour and 122 mg/L, respectively. His x-ray, chest PA view revealed cardiomegaly. Both echocardiography and CT angiography of thorax revealed dilated aortic root, diameter of 25 mm with normal aortic valve and both coronary arteries. Dilated aortic root was persisting as such even after six months follow up. Doppler study of peripheral arteries was normal. He was given high-dose aspirin, intravenous immunoglobulin IgG and low molecular weight heparin for two weeks.

A
Serum albumin <3 gm/dL. Anaemia for age. Elevation of aminotransferase. Platelets after seven days >4,50,000/cmm. WBS>1500/cmm. Urine WBC >10/hpf.
B
Z score of LAD or RCA >2.5.
Coronary artery meet Japanese Ministry of Health criteria for aneurysm. Internal lumen diameter. >3 mm in children<5 years old or >4 mm in children >5 years old. Of segment measures >1.5 times that of an adjacent segment. Clearly, irregular coronary lumen.
Other six suggestive features (if >3 features positive). Perivascular brightness of coronary artery. Lack of tapering of coronary arteries. Decrease LV function. Mitral regurgitation. Pericardial effusion. Z score in LAD or RCA of 2-2.5.

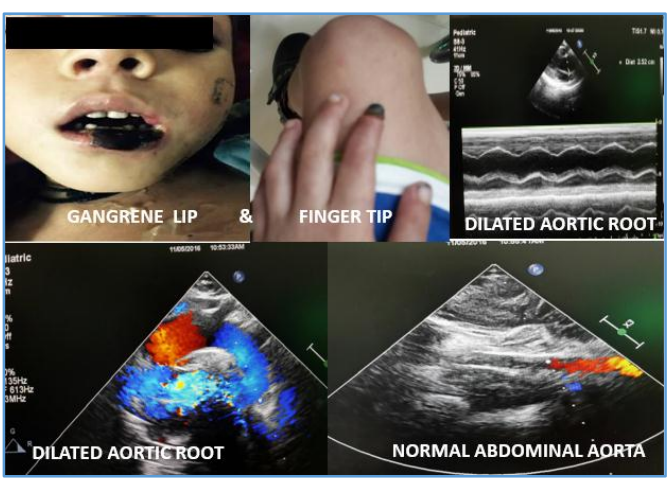

Figure 1. Showing Dilatation of Ascending Aorta and Gangrene of Lip and Little Finger

DISCUSSION

Kawasaki disease is also known as mucocutaneous lymph node syndrome. The diagnosis of KD is purely clinical, based on the presence of fever persisting for at least five days and further four out of five diagnostic criteria- limb changes, such as erythema or swelling of hand and/or foot during the acute stage and fingertip scaling over convalescence; polymorphous exanthema; bilateral conjunctivitis with no purulent discharge, lip erythema and cracking, raspberry tongue, throat redness and anterior cervical adenopathy with a 1.5 cm or larger size. As there are no specific laboratory markers, a high index of suspicion is required resulting in a rise in the number of cases diagnosed.[11,12] American Heart Association (AHA) had given diagnostic criteria for atypical Kawasaki disease, which includes children ≥6 months of age with unexplained fever for ≥5 days and 2 or 3 of the principal clinical features (compatible with 3 or 4 principal symptoms of the Japanese criteria) in the acute phase. The AHA gave six supplemental laboratory and echocardiographic criteria (Table 1) as supporting diagnosis. More than 3 laboratory criteria support the diagnosis of incomplete Kawasaki disease.[10]

KD is a primarily vasculitis, often seen in childhood being mediated by IgA, affecting more frequently small- and medium-sized vessels and it can lead to severe inflammation and fibrinoid necrosis of vessel walls. It often compromises vessels from the intima to the perivascular area forming aneurysms. The necrotising vasculitis leads to peripheral gangrene.[13]

Acute KD is often accompanied by coronary and noncoronary cardiac abnormalities, including Left Ventricular (LV) dysfunction, valvular regurgitation, pericardial effusion and aortic root dilation.[14] The coronary artery dilation occurs within 10 days of KD onset, whereas vasculitis involving larger arteries, potentially relating to aortic root dilation occurs on days 12 to 25 days of KD. The most severe complication of the disease is coronary vasculitis, manifesting as aneurysm, ectasia and stenosis. It is observed in 15%-20% of patients, if left untreated.[15] The coronary artery disease is responsible for 2% of mortality. KD results in focal abnormalities only at the site of aneurysms, vessel proximal and distal to the lesion appear healthy and have a smooth luminal surface and normal diameter. The prevalence of coronary artery abnormalities is 13.1% in cases with incomplete KD.[16]

KD may be associated with aneurysms of other arteries that is aorta with a higher number of reported cases involving the abdominal aorta,[15] axillary artery,[17] brachiocephalic artery,[18] iliac and femoral arteries and renal artery aneurysm. Thus, aorta should be assessed for the aortic root dilatation by measuring diameter while imaging for coronary artery aneurysm. This aortic dilations usually do not regress over the first year of the disease. Ravekes et al[16] and Printz FB et al[14] reported aortic root dilatation and did not detect any association between aortic root dilation and coronary artery dilation.

Ischaemic necrosis of the distal extremities is a rare, but potentially severe complication of KD. Gangrene is a rare presentation of Kawasaki disease that needs a high level of suspicion by physicians to discover the underlying disease. There are reports of peripheral gangrene due to KD from around the world, however, it seems that the reports are less from Japan as a country from where most of the KD cases are reported. There is no clear explanation why gangrene happens in KD, but some reasons have been emphasised as an aetiology such as arteritis, arteriospasm, thrombosis of inflamed vessels and decreased peripheral perfusion.[19] Malekzadeh et al[6] reported three infants with prolonged (more than 5 days) fever and peripheral gangrene without any other clinical manifestations of Kawasaki disease. All patients were treated with high-dose aspirin, IVIG and pulse therapy with methylprednisolone.

Additionally, cytotoxic drugs or infliximab were used for two of them because of severe aneurysms in the aortic branches. All three patients received aspirin with anti-platelet aggregation dose and two patient heparin as an anticoagulant agent for long time. After adequate treatment, peripheral gangrene, arterial dilatations and aneurysms improved, but during twelve months follow-up, coronary aneurysms did not improve completely. Council on cardiovascular disease in the young thoracic-aortic aneurysm was found in 0.9% and another patient had a necrotising vasculitis progressing to peripheral gangrene and tongue tip loss in 0.9%.[20]

KD patients with gangrene were also treated with prostacyclin besides therapy with intravenous immunoglobulins, corticosteroids, aspirin, anticoagulant, ilomedin, a prostacyclin analogue resulted in rapid improvement in the patient's condition without loss of extremity. Thus, those treating patients with Kawasaki disease must be aware of possible vascular ischaemia in the disease process that is reversible by early intervention treatments including the use of a prostacyclin analogue.[21] The Intravenous Immunoglobulin G (IVIG) administration over the first 10 days of the disease leads to a reduced coronary artery impairment of 3%-8% and mortality to 0.2%.[2,3]

Our patient was four years old had fever for more than 7 day and all six laboratory criteria with dilatation of aorta, left ventricular dysfunction and peripheral gangrene. Index case did not have granulomatosis with polyangiitis, microscopic polyangiitis or oeosinophilic granulomatosis with polyangiitis because ANCA was negative and these disorders are associated with ANCA antibodies.[22] He responded to oral aspirin, IV IgG, low molecular heparin very well. Gangrene improved, but dilatation of ascended aorta is persisted even at the end of six month months follow-up.

CONCLUSION

Thus, we conclude that earlier the diagnosis and therapeutic intervention with IV IgG administration, the lower will be the occurrence of complications even in the absence of coronary artery features. The presence of thrombocytosis, anaemia and elevated and extended inflammatory activity are risk factors for complication arising in atypical Kawasaki disease.

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