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Recognizing Kawasaki Disease in infants: importance of early detection and treatment

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Abstract

Background: *Kawasaki disease (KD) is an acute, self-limited vasculitis of unknown etiology that primarily affects children under five years of age. It is the leading cause of acquired heart disease in children in developed countries.*

Objective: *To highlight the clinical features, diagnostic challenges, and importance of timely treatment in Kawasaki disease, with emphasis on preventing cardiovascular complications.*

Methods: *We present a case report of an 11-month-old girl with classical KD and review the current diagnostic approach and treatment recommendations, supported by recent literature.*

Results: *The patient fulfilled the classical diagnostic criteria for KD, including prolonged fever, bilateral conjunctival injection, mucous membrane changes, polymorphous rash, extremity changes, and cervical lymphadenopathy. Laboratory findings supported the diagnosis. Timely administration of intravenous immunoglobulin (IVIG) and aspirin led to resolution of symptoms and no cardiac complications were observed on follow-up echocardiography.*

Conclusion: *KD remains a clinical diagnosis with no definitive laboratory test. Early recognition and prompt treatment with IVIG significantly reduce the risk of coronary artery aneurysms and other complications. High clinical suspicion is essential in all children presenting with prolonged unexplained fever. Early diagnosis and prompt treatment are crucial to preventing long-term cardiovascular complications, particularly coronary artery aneurysms, which can have significant implications for a child's health in later life.*

Keywords: Kawasaki disease, infant, prolonged fever, coronary artery aneurysms, polymorphous rash

Introduction:

Kawasaki disease (KD), formerly known as mucocutaneous lymph node syndrome, is one of the most common vasculitides of childhood and the leading cause of acquired heart disease in children in developed countries, particularly in East Asia.[1,2,3] It is typically a self-limited condition, with fever and acute inflammatory manifestations

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lasting an average of 12 days in the absence of treatment. Although its exact etiology remains unknown, KD occurs worldwide, with the highest incidence among children of East Asian ancestry, regardless of geographic location.[4,5] Other recognized risk factors include male sex, age between 6 months and 5 years, and a family history of KD. KD is characterized by systemic inflammation and mucocutaneous involvement, presenting with bilateral non-exudative conjunctivitis, erythema of the lips and oral mucosa, a polymorphous rash, changes in the extremities, and cervical lymphadenopathy. These features often appear sequentially rather than simultaneously, making repeated clinical assessments essential for timely diagnosis in children with prolonged fever and mucocutaneous signs.[6,7,8]

According to classical diagnostic criteria, KD is diagnosed in the presence of a fever lasting ≥5 days along with at least four of the five principal clinical features mentioned above, in the absence of an alternative explanation. Although laboratory findings are not included in the diagnostic criteria, supportive laboratory features (e.g., elevated inflammatory markers, leukocytosis, thrombocytosis) can strengthen diagnostic certainty.[1]

Cardiovascular complications, most notably coronary artery aneurysms (CAA), are the most serious outcomes of KD. These complications contribute significantly to the morbidity and mortality associated with the disease, particularly in untreated or severe cases. Fortunately, the incidence of coronary aneurysms and mortality has markedly declined due to the widespread use of intravenous immune globulin (IVIG). Early recognition and treatment with IVIG—ideally within the first 7 days and no later than day 10 of illness—reduces the risk of CAA by up to fivefold compared with untreated children.[9] Therefore, maintaining a high index of suspicion is critical in any child presenting with prolonged unexplained fever.

CASE REPORT:

An 11-month-old girl was admitted to the pediatric infectious disease ward at Durrës Regional Hospital, Albania, with a 5-day history of high-grade fever, bilateral conjunctivitis, and a widespread rash. She had received oral cefixime over the previous three days without clinical improvement. The fever remained persistent and was minimally responsive to antipyretics.

On admission, the patient appeared ill, with a temperature of 38.8°C and reduced oral intake. A polymorphous rash was evident on the trunk, back, and extremities (Figure 1), consisting of maculopapular lesions. Erythema of the palms and soles was also noted (Figure 2). Bilateral nonexudative conjunctival injection had been present since the onset of fever. Her lips were hyperemic, and the oropharynx appeared injected. Bilateral cervical lymphadenopathy was palpable, with the largest lymph node on the right side. Cardiopulmonary and abdominal examinations were unremarkable, except for a few episodes of diarrhea.

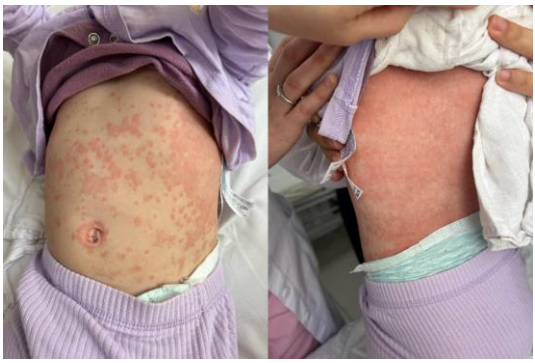

Figure 1: Maculopapular rash on the trunk and back

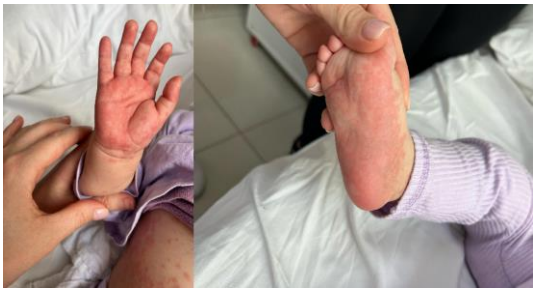

Figure 2: Erythema of the palms and soles

Laboratory investigations on admission revealed significant leukocytosis (WBC count 36,000/μL) with a neutrophilic predominance (78% neutrophils, 17.7% lymphocytes), thrombocytosis (platelets 602,000/μL), and elevated transaminases (ALT 262 U/L, AST 122 U/L). C-reactive protein was markedly elevated (3.31 mg/dL), and fibrinogen activity was high (447 mg/dL). Hemoglobin was 11.4 g/dL, and hematocrit was 32.6%. Other parameters, including blood urea nitrogen, creatinine, ASLO titer, and coagulation profile (PT, INR, aPTT), were within normal limits.(Table 1) Serologic tests for Epstein-Barr virus (IgM and IgG) were negative.

Table 1 : Results of laboratory exams on admission

	Results	**Reference range**
White blood cells	36 K/μL	5 – 12 K/μL
Red blood cells	4.32 x 10^6/μL,	3.8 – 5 x 10^6/μL
Hemoglobin	11.4 g/dl	9.7 – 12 g/dl
Hematocrit	32.6 %	32 – 42 %
Platelets	602 K/μL	150 – 400 K/μL
Blood urea nitrogen	11.5 mg/dl	10.9 – 36 mg/dl
Creatinine	0.32 mg/dl	0.32 -0.53 mg/ dl
ALT	262 U/L	5 – 33 U/L
AST	122 U/L	20 – 67 U/L
C Reacttive Protein	3.31 mg/dl	< 0.5 mg/dl
ASLO	<50 IU/mL	0 – 50 IU/mL
PT	77%	70 -110 %
aPTT	1.10	0.85 – 1.15
INR	32.2 sec	20 – 35 sec
Fibrinogen activity	447 mg/dl	160 – 390 mg/dl

Urinalysis revealed the presence of 40–45 leukocytes per high-power field (hpf). Radiologic examination of the lungs was normal, with no evidence of pulmonary involvement. Abdominal ultrasound findings were also within normal limits. Cervical ultrasound revealed bilateral reactive lymphadenopathy, with the largest lymph node located on the right side measuring 1.4 × 1.0 cm. The parotid and submandibular glands appeared normal.

Initial treatment included broad-spectrum antibiotics, intravenous rehydration, and antipyretics. Despite this, the child remained persistently febrile. On the following day, swelling of the feet was noted (Figure 3).

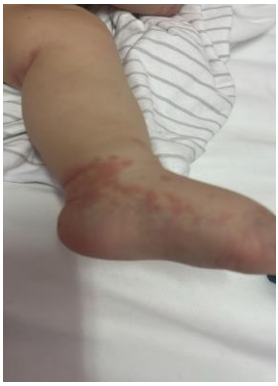

Figure 3: Soft edema of the feet

Based on the diagnostic criteria established by Dr. Tomisaku Kawasaki in 1967, the child meets the classical clinical criteria for Kawasaki disease (KD). This includes a persistent fever lasting six days, along with mucocutaneous involvement, bilateral non-exudative conjunctivitis, erythema of the lips and oropharynx, polymorphous rash, extremity changes, and cervical lymphadenopathy. Laboratory findings supportive of KD in this case include leukocytosis with a left shift in neutrophils, elevated platelet count, elevated C-reactive protein, increased transaminases, high fibrinogen activity, and sterile pyuria (≥10 WBCs/hpf).

The patient was subsequently transferred to a tertiary care center, where treatment with intravenous immunoglobulin (IVIG, 2 g/kg) and aspirin (30 mg/kg/day divided into four doses) was initiated. Echocardiographic evaluation showed no coronary artery abnormalities.

DISCUSSION:

Kawasaki Disease (KD) is a systemic inflammatory condition that predominantly affects medium-sized arteries, especially the coronary arteries. Studies reveal that multiple organs and tissues are involved, but long-term consequences tend to be most severe in the arteries.[10] KD is a globally recognized disease that spans across all racial and ethnic groups, but it is more common in children of East Asian descent.[4,5] The highest incidence of KD is observed in children under the age of five, and it is quite rare in children under six months of age and older children. The disease's occurrence in adults is exceedingly rare.[11] Boys are diagnosed with KD more frequently than girls, with a male-to-female ratio of approximately 1.5:1.

The precise etiology of KD remains elusive; however, various theories propose potential causes, including genetic factors, infections, environmental triggers, and immune responses. [12,13] While the clinical presentation of KD may vary, some hallmark features are widely recognized, such as prolonged fever, cervical lymphadenopathy, bilateral conjunctivitis, oral mucosal changes, and polymorphous rashes.[14,15] Additionally, the disease can cause significant changes to the extremities, such as erythema of the palms and soles and periungual desquamation.

In most cases, KD is diagnosed based on clinical criteria established by Tomisaku Kawasaki in 1967,[16] which require fever lasting at least five days, along with at least four of the following physical findings:

- Bilateral conjunctival injection.
- Oral mucosal changes such as red, cracked lips or "strawberry tongue."
- Peripheral extremity changes including erythema of palms and soles, and edema of hands or feet.
- Polymorphous rash.
- Cervical lymphadenopathy (with at least one node larger than 1.5 cm in diameter).

In most cases, KD is diagnosed based on clinical features alone[16]. When the diagnosis cannot be established clinically, laboratory testing may be used to help support a diagnosis of incomplete KD .Laboratory findings suggestive of KD include the following:

- Elevated acute-phase reactants (C-reactive protein [CRP] ≥3 mg/dL [≥30 mg/L] or erythrocyte sedimentation rate [ESR] ≥40 mm/hour)
- White blood cell (WBC) count ≥15,000/microL
- Normocytic, normochromic anemia for age
- Platelet cell count ≥450,000/microL after seven days of illness
- Non-neutrophilic (sterile) pyuria due to urethritis in KD (≥10 WBCs/high-power field)
- Serum alanine aminotransferase level >50 units/L
- Serum albumin ≤3 g/dL

Some patients may not fulfill the full diagnostic criteria and present with "incomplete KD" especially in infants or those with only two or three clinical features. In these cases, additional clinical suspicion and testing are necessary.

Cardiovascular findings, although not part of the diagnostic criteria, are critical in supporting a diagnosis of KD. Medium or larged sized aneurysms are usually not seen until after day 10 of illness. Echocardiography should be performed in all patients as soon as a diagnosis of KD is suspected in order to establish a reference point for longitudinal follow-up and treatment efficacy. The most important cardiovascular finding is CA aneurysms. CA aneurysms are defined as follows:

- Dilation – Z-score 2 to <2.5
- Small aneurysm – Z-score ≥2.5 to <5
- Medium aneurysm – Z-score ≥5 to <10 and absolute dimension <8 mm
- Large aneurysm – Z-score ≥10 or absolute dimension ≥8 mm

Treatment for KD is generally in accordance with the guidelines from the American Heart Association (AHA) and the American Academy of Pediatrics (AAP). The first-line treatment involves the administration of intravenous immunoglobulin (IVIG) at a dose of 2g/kg, given as a single infusion over 8 to 12 hours. Additionally, aspirin therapy is

often used ranging from 30 to 100 mg/kg/day divided into four doses, unless contraindicated. For children who are at high risk of IVIG resistance, the use of systemic corticosteroids or other immunomodulators is recommended.[17,18,19] Children who meet partial criteria (incomplete KD) are treated no differently from children who fulfill diagnostic criteria for KD.

CONCLUSION:

Kawasaki Disease (KD) presents diagnostic challenges, and delays in treatment can result in significant harm, particularly regarding cardiovascular complications. If KD is suspected but the diagnosis cannot be confirmed, it is essential to refer the patient promptly to a specialized center with experience in managing this disease. Early and accurate diagnosis is critical, as delays can lead to the development of coronary artery aneurysms (CAAs) and other serious cardiac issues. Treatment with intravenous immune globulin (IVIG) within the first 10 days of illness—ideally before day 7—has been shown to reduce the prevalence of CAAs by fivefold compared to untreated children. Therefore, early recognition and intervention are crucial to improving outcomes and minimizing the long-term consequences of KD. Delayed diagnosis not only increases the risk of severe cardiac complications but also results in higher morbidity, underscoring the importance of timely and effective management.

REFERENCES:

1. Burns JC, Glodé MP. Kawasaki syndrome. Lancet 2004; 364:533.
2. Younger DS. Epidemiology of the Vasculitides. Neurol Clin 2019; 37:201.
3. McCrindle BW, Rowley AH, Newburger JW, et al. Diagnosis, Treatment, and Long-Term Management of Kawasaki Disease: A Scientific Statement for Health Professionals From the American Heart Association. Circulation 2017; 135:e927.
4. Singh S, Vignesh P, Burgner D. The epidemiology of Kawasaki disease: a global update. Arch Dis Child 2015; 100:1084.
5. Watts RA, Hatemi G, Burns JC, Mohammad AJ. Global epidemiology of vasculitis. Nat Rev Rheumatol 2022; 18:22.
6. Ozdemir H, Ciftçi E, Tapisiz A, et al. Clinical and epidemiological characteristics of children with Kawasaki disease in Turkey. J Trop Pediatr 2010; 56:260.
7. Fukushige J, Takahashi N, Ueda Y, Ueda K. Incidence and clinical features of incomplete Kawasaki disease. Acta Paediatr 1994; 83:1057.
8. Sung RY, Ng YM, Choi KC, et al. Lack of association of cervical lymphadenopathy and coronary artery complications in Kawasaki disease. Pediatr Infect Dis J 2006; 25:521.
9. Broderick C, Kobayashi S, Suto M, et al. Intravenous immunoglobulin for the treatment of Kawasaki disease. Cochrane Database Syst Rev 2023; 1:CD014884.
10. Amano S, Hazama F, Kubagawa H, et al. General pathology of Kawasaki disease. On the morphological alterations corresponding to the clinical manifestations. Acta Pathol Jpn 1980; 30:681.
11. Gomard-Mennesson E, Landron C, Dauphin C, et al. Kawasaki disease in adults: report of 10 cases. Medicine (Baltimore) 2010; 89:149.
12. Burgner D, Harnden A. Kawasaki disease: what is the epidemiology telling us about the etiology? Int J Infect Dis 2005; 9:185.
13. Takahashi K, Oharaseki T, Yokouchi Y. Pathogenesis of Kawasaki disease. Clin Exp Immunol 2011; 164 Suppl 1:20.
14. Germain BF, Moroney JD, Guggino GS, et al. Anterior uveitis in Kawasaki disease. J Pediatr 1980; 97:780.

15. Wang S, Best BM, Burns JC. Periungual desquamation in patients with Kawasaki disease. Pediatr Infect Dis J 2009; 28:538.
16. Kawasaki T. [Acute febrile mucocutaneous syndrome with lymphoid involvement with specific desquamation of the fingers and toes in children]. Arerugi 1967; 16:178.
17. Muta H, Ishii M, Egami K, et al. Early intravenous gamma-globulin treatment for Kawasaki disease: the nationwide surveys in Japan. J Pediatr 2004; 144:496.
18. Newburger JW, Takahashi M, Gerber MA, et al. Diagnosis, treatment, and long-term management of Kawasaki disease: a statement for health professionals from the Committee on Rheumatic Fever, Endocarditis and Kawasaki Disease, Council on Cardiovascular Disease in the Young, American Heart Association. Circulation 2004; 110:2747.
19. Kobayashi T, Saji T, Otani T, et al. Efficacy of immunoglobulin plus prednisolone for prevention of coronary artery abnormalities in severe Kawasaki disease (RAISE study): a randomised, open-label, blinded-endpoints trial. Lancet 2012; 379:1613.