Advances in Medicine and Engineering Interdisciplinary Research, 2026, Volume 4, Issue 2
DOI: 10.32629/ameir.v4i2.5257
ISSN Online: 2972-3825
ISSN Print: 2972-3833

Fever in the pediatric patient. The importance of repeated physical examination

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Abstract: Clinical pictures consisting of fever and systemic inflammation with mucocutaneous involvement can be caused by multiple aetiologies. Prognosis, in some cases, depends on diagnosis and on early treatment. We present the clinical case of a boy seen in the emergency department with fever, and abdominal and cervical pain. In this case, findings of leucocytosis, neutrophilia, increased acute phase reactants and transaminases initially lead to gastrointestinal disease. However, continued physical examination and high degree of suspicion enabled to make the correct diagnosis of Kawasaki disease using echocardiogram within the first five days of the disease. The treatment was intravenous gamma globulin, with a favourable evolution and complete recovery four months after diagnosis.

Key words: pediatrics; fever; Kawasaki disease; cardiology

1 Introduction

Multiple conditions cause systemic inflammation with mucocutaneous involvement in pediatric patients. Among these, the following stand out for their frequency: exanthematous diseases, autoimmune diseases, vasculitis, or reactions mediated by toxins and allergens. Diagnosis requires maintaining a high index of suspicion and periodically reevaluating the patient. Delay in initiating treatment, in some cases, leads to a poorer prognosis.

Among these diseases is Kawasaki disease, a small- and medium-vessel vasculitis of unknown etiology. A pathological immune response to infectious factors in genetically predisposed individuals is hypothesized. It is the most common cause of acquired heart disease in childhood. It is most prevalent in Asia, especially in Japan, with an increasing incidence. In Europe, the incidence is 5.4–15 per 100,000 children under 5 years of age, and in Spain, it is unknown. Eighty-five percent of cases occur in children under 5 years of age.

We present the clinical case of a child with fever and multisystem inflammation. In this case, continuous evaluation allowed us to establish a diagnosis of Kawasaki disease and initiate early treatment, thereby reducing the risk of morbidity and mortality associated with the condition.

2 Clinical case

A five-year-old patient presented to the emergency department with a fever of up to 39°C that had persisted for three days. The patient reported neck pain and generalized abdominal discomfort. The patient is up-to-date on vaccinations, has no allergies, and no other relevant medical history.

On physical examination, the patient is hemodynamically stable. He appears distressed and irritable, with a tendency to cry and minimal conjunctival hyperemia. He reports pain and limited cervical flexion. Abdominal tenderness is present. The remainder of the examination is unremarkable.

A urine sediment is requested, which is normal, and a blood test, which shows leukocytosis with neutrophilia (leukocytes 26,100/µl, neutrophils 21,800/µl), elevated acute-phase reactants (APR) (CRP 260 mg/dL, fibrinogen > 1000 mg/dL), and elevated liver enzymes (ALT 195 U/L, AST 65 U/L, GGT 274 U/L).

Antipyretics and intravenous analgesics are prescribed, but despite this, the abdominal pain persists along with progressively more pronounced guarding, so an abdominal ultrasound is performed, which rules out acute abdomen. Subsequently, due to irritability, neck pain, and neck stiffness, a lumbar puncture is performed, which rules out bacterial meningitis (leukocytes 28 / mm³, red blood cells 41,920 / mm³, glucose 62 mg/dL, protein 83 mg/dL, lactate 1.4 mmol/L).

Given the clinical and laboratory findings indicating a serious condition in a febrile patient without an established source of infection, admission was decided upon after cultures were collected and empirical antibiotic therapy was initiated to address possible sepsis of abdominal origin. A differential diagnosis has been performed to date, including acute abdomen (ruled out by ultrasound), bacterial meningitis (a lumbar puncture was performed and was normal), viral exanthematous infectious diseases (ruled out due to leukocytosis with elevated APR), scarlet fever (negative culture of pharyngotonsillar exudate), and sepsis (empirical antibiotic therapy was initiated).

During hospitalization, the child's general condition remains compromised, with a tendency to cry and conjunctival hyperemia (Figure 1). Within the first twenty-four hours, a mild erythematous micromacular rash predominantly on the trunk becomes apparent (Figure 1), coinciding with the onset of musculoskeletal discomfort, edema in the lower extremities, and oligoanuria. Laboratory tests show increased leukocytosis and acute phase reactants (APR) (leukocytes 27,700/µl, CRP 307.7 mg/dl) with hypoalbuminemia (32.5 g/dl), so intravenous fluids were restricted and diuretic treatment was initiated.

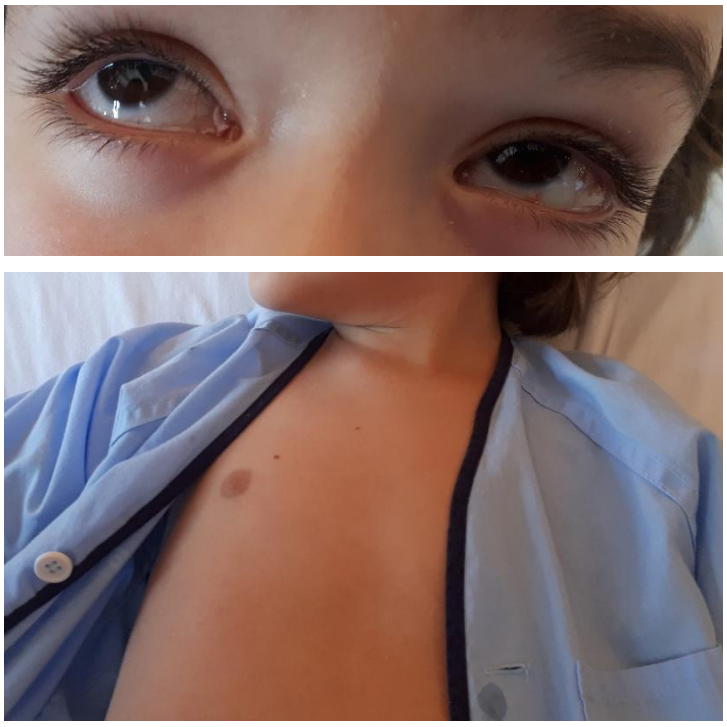

Figure 1. Top: Non-exudative conjunctival hyperemia. Bottom: Diffuse erythematous micromacular rash on the chest and trunk

Forty-eight hours after admission, due to the appearance of lingual papillary hypertrophy and labial rhagades (Figure 2) with persistent conjunctival hyperemia and nonspecific rash, an autoimmune condition with vascular involvement was suspected. An echocardiogram was performed, showing dilation of both coronary arteries and perivascular hyperrefringence (Figure 3). Given these findings, a diagnosis of Kawasaki disease was made within the first five days of the disease's course.

Treatment is initiated with intravenous immunoglobulin and antiplatelet therapy. Additionally, intravenous corticosteroid therapy is added due to the significant coronary involvement at diagnosis.

The patient's general condition improved, the edema resolved, and the fever subsided following the initiation of treatment. A decrease in APR and an increase in platelet count were confirmed. Ultrasound revealed a progressive reduction in coronary artery diameter, with complete resolution four months after diagnosis.

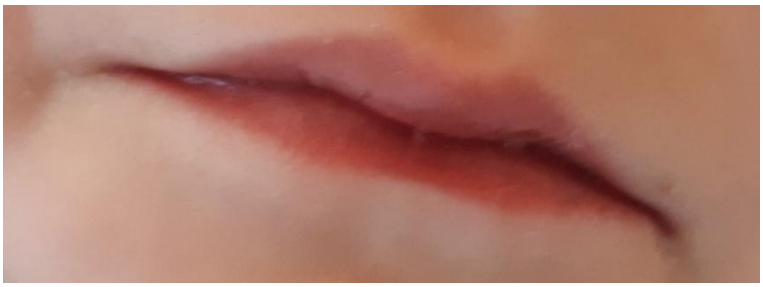

Figure 2. Rhagades and oral fissuring

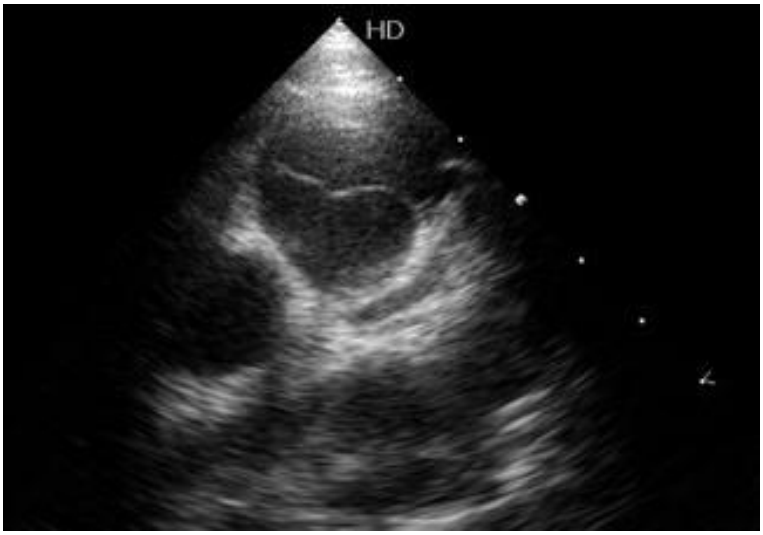

Figure 3. Perivascular hyperrefringence in both coronary arteries. Left coronary artery origin 3.5 mm (Z + 2.97), anterior descending artery 3 mm (Z + 3.29), circumflex artery 2 mm (Z + 0.65), right coronary artery origin 3 mm (Z + 2.32). No aneurysms. Mild-to-moderate mitral insufficiency

3 Discussion

Kawasaki disease is one of the most common vasculitides in childhood. It affects children under 5 years of age in 85% of cases. Its prevalence and incidence are higher in Asian countries, primarily in Japan. An infectious origin is suggested, which has not yet been identified, affecting genetically predisposed individuals.

It is characterized by the presence of fever and manifestations secondary to systemic inflammation. Repeated medical history and physical examination are essential for early diagnosis. According to the classic criteria, the diagnosis requires the presence of fever for at least five days and four of the following signs: non-exudative conjunctival hyperemia, oral

mucosal involvement, changes in the hands or feet, polymorphic rash, or lateral cervical lymphadenopathy. Patients who do not meet the criteria described above have incomplete Kawasaki disease. In this case, the diagnosis is based on the presence of any of the aforementioned clinical criteria, laboratory abnormalities (CRP > 3 mg/dL, ESR > 40 mm/h, anemia, platelets > 450,000/µl, albumin < 3 g/dl, elevated ALT, white blood cells > 15,000/µl, sterile pyuria), or coronary involvement on echocardiogram.

In patients diagnosed with Kawasaki disease, a single dose of intravenous immunoglobulin at 2 g/kg is recommended, with greater efficacy if treatment is initiated within the first ten days. The American Academy of Pediatrics and the American Heart Association also recommend treatment with aspirin. Treatment is initiated at 50 mg/kg/day, with the dose reduced to 3–5 mg/kg/day 48 hours after the fever subsides. This treatment should be continued until the APR normalizes; however, in patients with coronary involvement, it is extended for at least 6 months. In children at risk of resistance to gamma-globulin therapy, it is recommended to add glucocorticoids in a tapering regimen for two weeks.

Mortality associated with this condition is on the decline. However, we must not forget that in patients with significant cardiac involvement, complications such as arrhythmias, aneurysms, myocardial infarction, or coronary rupture may occur.

Pediatricians and family physicians must be familiar with this disease and closely monitor its clinical manifestations to maintain a high index of suspicion and refer the patient for diagnostic confirmation as early as possible, since prognosis and morbidity or mortality are determined by early diagnosis and initiation of treatment.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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