

Clinical Note

Sudden death of a two-year-old with Kawasaki disease

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ABSTRACT

La enfermedad de Kawasaki es una vasculitis sistémica que afecta a arterias de pequeño o mediano calibre, y es la principal causa de cardiopatía adquirida en la infancia. La afectación coronaria es frecuente y se produce en forma de aneurismas. Sin embargo la trombosis de estos aneurismas con infarto de miocardio y/o muerte súbita es rara. Presentamos el caso de un paciente de 2 años diagnosticado de enfermedad de Kawasaki tratado con gammaglobulina iv y AAS, que presentó a los 2 meses un síndrome coronario agudo con trombosis de la arteria descendente anterior en el que se indicó reperfusión con rTPA intravenoso. Dos meses después es traído a urgencias en parada cardiorrespiratoria de la que se recupera. En la necropsia se encontró un aneurisma gigante trombosado en la arteria coronaria izquierda.

Key Words: Kawasaki disease. Coronary aneurisms. Myocardial infarction.

RESUMEN

Muerte súbita en un niño de 2 años con enfermedad de Kawasaki

The Kawasaki syndrome or disease is a systemic vasculitis affecting medium- or small-calibre arteries and is the main cause of acquired heart disease in childhood. Coronary involvement is frequent and manifest as aneurysmata. However, thrombosis of these aneurysmata with acute myocardial infarction and/or sudden death is uncommon. We report the case of a two-year-old male patient with a diagnosis of Kawasaki disease and under therapy with i.v. gammaglobulin and acetylsalicylic acid, who after two months evidenced an acute coronary artery syndrome with anterior descending artery thrombosis, for which reperfusion with intravenous rTPA was indicated. Two months later he was brought to the Emergency Department in a state of cardiorespiratory arrest; the necropsy studies disclosed a thrombosed giant aneurysm in the left coronary artery.

Palabras clave: Enfermedad de Kawasaki. Aneurismas coronarios. Infarto de miocardio.

INTRODUCTION

Kawasaki disease (KD) is a systemic vasculitis that affects small and medium calibre arteries and often implies coronary involvement.

KD generally affects children under five (80%) and is most common at the age of two. Annual incidence rates vary from 60-90 cases/100,000 children in Japan to 10 cases/100,000 children in Europe and the United States^{1,2}.

The cause is still unclear. Several theories have been put forward and the most widely accepted is that an infectious agent triggers the disease in individuals who are genetically predisposed³. The diagnosis is based on established clinical

criteria⁴ (Table 1) and a temperature and at least 4 out of the 5 remaining symptoms should be present. However, at times it is difficult to diagnose given the vagueness of most of signs and symptoms. Therefore it is important to recognise the incomplete or atypical forms of KD (more common in children under one year old) since they can also present fatal cardiovascular complications^{5,6}.

KD is the main cause of acquired heart disease in children⁷. Coronary involvement in the form of arterial aneurysms occurs in 20%-25% of cases that are not treated⁸. The general complication that affects these aneurysms is coronary thrombosis and this is more common during the first year of the disease⁹.

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TABLE 1. Clinical criteria of Kawasaki Disease

1. A fever lasting 5 days or more.
2. Bilateral conjunctival infection without exudates.
3. Nonulcerative changes in the buccopharyngeal mucous.
4. Changes affecting the extremities including oedema or erythema of the hands and/or feet and flaking of the skin in the periungual area.
5. A polymorphous rash without blisters.
6. Cervical lymphadenopathy with nodes larger than 1.5 cm.

The echocardiogram is the method of choice for detecting coronary damage and it is recommended that it is carried out at the time of diagnosis as it can be used for basal control. It is also useful for diagnosing atypical KD4.

CLINICAL CASE

A two-year-old patient had a temperature for 9 days and showed symptoms compatible with KD (Table 1). He received early treatment with gamma globulin (2 g/kg of weight administered as a 12 hour perfusion) and 100 mg/kg/day of aspirin. His condition improved and the temperature disappeared after 48 hours. The echocardiogram showed a 10 mm aneurysmatic dilatation in the left coronary artery and a 4 mm dilatation in the right coronary artery. Treatment with acenocumarol and aspirin (5 mg/kg/day) was given from that point on.

Two months after diagnosis, the patient was brought to the emergency department with oppressive chest pain. The

ECG showed a ST segment depression in leads V1 and V5 (Figure 1). The patient was quickly transferred to the paediatric haemodynamic unit where intravenous fibrinolytic treatment was administered (rt-PA) for total occlusion of the anterior descending coronary artery and obtained satisfactory results. When the patient was discharged 2.5 mg/8 hours of propranolol, 12.5 mg - 0-6.35 mg of hydrochlorothiazide, 12.5 mg - 0-6.25 mg of spironolactone and 5 mg/24 hours of pravastatin were added to his treatment. A dual-isotope myocardial study was undertaken which showed a perfusion defect in the anteroapical region.

Sixty-eight days after the acute coronary syndrome (140 days after the disease), the patient was brought to hospital in cardiac arrest. Advanced CPR was carried out but this was abandoned after 85 minutes because the patient was unresponsive. The post mortem examination revealed that the patient suffered from a giant thrombosed aneurysm in the left coronary artery and an acute heart attack.

CONCLUSION

The current standard treatment for KD is based on the administration of administering intravenous gamma globulin and aspirin to all children affected within the first 10 days after the disease is diagnosed⁴. This treatment is moderately effective in reducing coronary damage and when the aneurysm is small or medium in size. Early treatment seems to prevent large aneurysms which generally do not regress¹⁰.

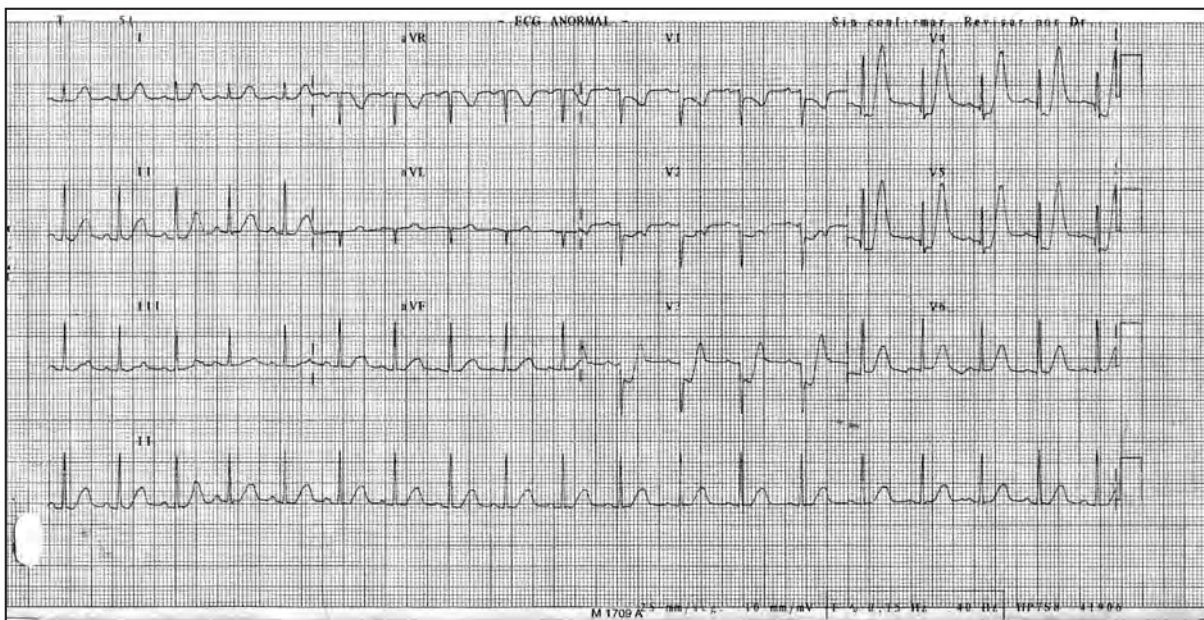


Figure 1. The electrocardiogram of the patient affected by Kawasaki disease with chest pain. Examinations revealed occlusion of the anterior descending coronary artery.

A high prevalence of cardiovascular complications in has recently been reported older children due to late diagnosis of KD¹¹.

The two most common causes of myocardial infarction among children in some studies are the anomalous origin of the left coronary artery arising from the pulmonary artery (35%) and KD (27%)¹². Ischaemic heart disease during the development of KD affects 4.7% of patients and acute myocardial infarction affects 1.9%. Death occurs in 0.8% of cases⁸. Detecting these complications early in children can often be difficult given that symptoms may be atypical and painless.

Shortness of breath, vomiting or rejecting food are the main symptoms and therefore a high level of clinical suspicion is needed to diagnose complications. Electrocardiograms, identifying specific myocardial enzymes, echocardiograms and cardiac catheterisms all confirm the diagnosis.

Coronary thrombosis generally starts in the area close to the affected segment and can develop quickly, forming a thrombus which occludes the artery, as occurred in the case of our patient. In adults, this phenomenon is associated with the rupture or inflammation of the atheromatous plaque which activates the coagulation system. This has not been observed in thrombosis linked to KD. Therefore, the thrombolytic protocol established for adults with coronary heart disease may not be appropriate for those with KD⁴.

Coronary thrombosis in KD is often massive and leads to a heart attack with major damage to the heart muscle and a low residual ejection fraction, despite possible high exercise tolerance¹². In our case, the ejection fraction stayed the same

after the first complication. With regard to the treatment of an acute heart attack for this age group, fibrinolysis, anticoagulation and antiaggregation treatments have all been used successfully¹³⁻¹⁵. Percutaneous transluminal coronary angioplasty with stents is a valid alternative, although there is less experience in this procedure¹⁶. A thorough evaluation of existing heart damage is necessary when treating these children and stress tests need to be carried out to ascertain whether there is myocardial tissue at risk which would benefit from reperfusion. This is generally carried out surgically in a coronary revascularisation procedure. A heart transplant is a valid option in non-revascularisable cases with a low ejection fraction^{4,17}.

The long term consequences of coronary involvement in KD are still unclear. It has been observed that the regression of aneurysms does not mean they are cured given that structural anomalies remain. The prevalence of progressive coronary stenosis also appears to increase with age^{2,18}. Our patient was discharged and a check up on the surgical treatment of the coronary damage was scheduled and depended on his progress.

Today, treatments that complement gamma globulin and aspirin are being investigated (for example high dose corticosteroids, methotrexate, anti-TNF monoclonal antibodies or cyclophosphamide) to establish whether the long term prognosis^{4,19} can be improved. The role of antiaggregant and anticoagulant treatments in the long term is also being assessed as a secondary preventive measure for heart complications.

However, we believe that our main weapons for preventing coronary complications are currently an early diagnosis of KD and correct treatment from the outset.

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