

Kawasaki Disease: A Simple Overview

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Abstract: Kawasaki disease (KD), often called Kawasaki syndrome, is a condition that primarily affects children under the age of five and can harm the heart and blood vessels. Boys are more likely than girls to be affected. Kawasaki disease is thought to be caused by an aberrant immunological response, probably in reaction to an infection, though the precise etiology is still unknown. There is no known technique to prevent it, and it is not communicative. Treatment with aspirin and intravenous immunoglobulin (IVIG) at an early stage is essential to lowering the likelihood of major complications, particularly heart-related ones such as coronary artery aneurysms. In India, Kawasaki disease has gained more recognition during the past 20 years and could soon overtake acute rheumatic fever as the leading cause of acquired heart disease in children. In India, the great majority of children who suffer from Kawasaki disease are still undiagnosed. A constellation of clinical symptoms with a predictable temporal sequence is used to diagnose Kawasaki disease. The subtleties involved in diagnosing Kawasaki disease must be understood by all pediatricians. The risk of coronary artery anomalies might be considerably decreased with early identification and timely treatment. KD, often called Kawasaki syndrome, is a condition that primarily affects children under the age of five and can harm the heart and blood vessels. Boys are more likely than girls to be affected. Kawasaki disease is thought to be caused by an aberrant immunological response, probably in reaction to an infection, though the precise etiology is still unknown. There is no known technique to prevent it, and it is not communicative. Treatment with aspirin and intravenous immunoglobulin (IVIG) at an early stage is essential to lowering the likelihood of major complications, particularly heart-related ones such as coronary artery aneurysms. In India, Kawasaki illness has gained more recognition during the past 20 years and could soon overtake acute rheumatic fever as the leading cause of acquired heart disease in children. In India, the great majority of children who suffer from Kawasaki disease are still undiagnosed. A constellation of clinical symptoms with a predictable temporal sequence is used to diagnose Kawasaki disease. The subtleties involved in diagnosing Kawasaki disease must be understood by all pediatricians. The risk of coronary artery anomalies might be considerably decreased with early identification and timely treatment.

Keywords: Syndrome, Acute Rheumatic fever, Pediatricians, Acquired heart Disease, Coronary artery, Intravenous immunoglobulin, Aneurysms

I. Introduction

Kawasaki disease (KD), a vasculitis of unknown etiology that typically affects children under five years old's medium-sized arteries, was initially identified in 1967 by Japanese pediatrician Tomisaku Kawasaki. According to estimates, KD affects 9 to 20 out of every 100,000 children under the age of five in the continental United States. Over 5,000 children under the age of 18 were admitted to hospitals in the US in 2019 because of KD. 3,693 of these kids were younger than five years old, which translates to an 18.9 hospitalization rate per 100,000 kids in that age range. The most widely accepted explanation for its pathophysiology is that a genetically predisposed child's immune system is activated by an unidentified infectious agent. It is an acute febrile illness that mostly affects the lymph nodes, skin, and mucosa. Despite being previously thought to be benign, this illness has drawn the attention of pediatric cardiologists and pediatricians worldwide after it was later found to have a dangerous complication of coronary artery aneurysm.

The rare publication of the English translation of the original Japanese report underscores the significance and interest in this illness. Since Japan is the nation where the disease was initially discovered and where the greatest number of new patients are diagnosed annually, researchers there have been working tirelessly to solve the disease's enigma.

Definition

Mucocutaneous lymph node syndrome, another name for Kawasaki disease (KD), is an acute inflammatory illness that primarily affects children under five. It results in vasculitis, an inflammation of medium-sized blood vessels, particularly the coronary arteries that provide blood to the heart. In many nations, including the US and Japan, it is the primary cause of childhood-acquired heart disease.

Incidence

In 2011, the first and only epidemiologic study on KD from India was released. According to this, there are at least 4.54 cases of KD for every 100,000 children under the age of 15 in Chandigarh. Since there is no way to determine the exact number of children with KD that are being missed, this number is most likely an underestimate. Between 1994 and 2019, Chandigarh, India, saw a monthly increase in incidence of 0.002 cases/100,000 children under the age of five and 0.0165 cases/100,000 children under the

age of fifteen. Forecasts for 2020–2030 indicate a consistent monthly increase of 0.0177 cases/100,000 children under the age of 15. This trend reflects tendencies of increasing KD incidence worldwide.

Causes

Although the precise origin is unknown, scientists think it might be related to:

- A genetic propensity that runs in some families
- A triggering infection, which could be bacterial or viral
- An aberrant response from the immunological system

Risk Factors

Environmental and Infectious Causes:

Infections: Numerous studies indicate that an infection may serve as a trigger for Kawasaki Disease in genetically predisposed individuals, even if no particular virus or bacteria has been found to be the main cause. Viruses such as influenza, respiratory syncytial virus (RSV), and Epstein-Barr virus (EBV) have frequently been suspected in numerous research.

Environmental Factors: A number of environmental factors have been proposed as possible causes of Kawasaki Disease, including air pollution and other environmental pollutants. In line with viral infections, there can also be a seasonal pattern, with more instances observed in the winter and spring.

Autoimmune and Genetic Causes:

hereditary Predisposition: Studies indicate that some children may be more prone to Kawasaki Disease due to specific hereditary causes. Asian youngsters, especially those of Japanese or Korean ancestry, are more likely to have it, which may indicate a hereditary tendency. Nonetheless, children from many ethnic origins have been shown to have the illness.

Autoimmune Response: The body's immune system unintentionally targets its own tissues in Kawasaki Disease, which is classified as an autoimmune condition. This causes inflammation of the blood vessels. In children with a genetic predisposition, an illness or environmental condition may cause this autoimmune reaction.

Dietary and lifestyle factors:

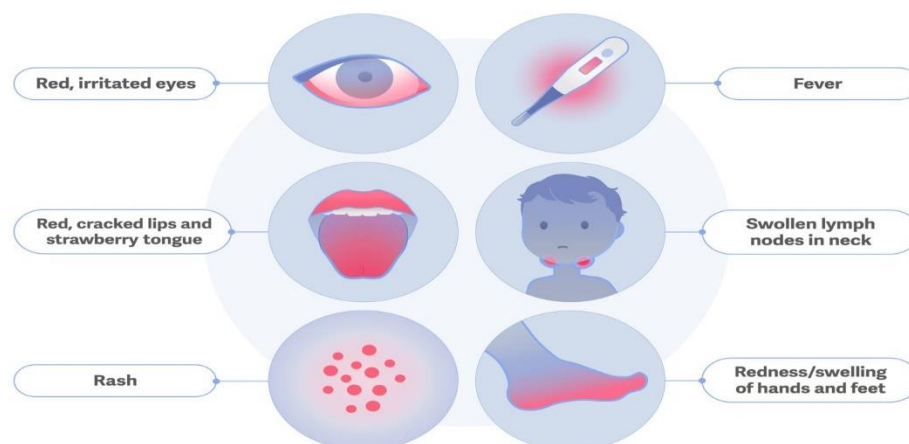
The impact of diet: Although a balanced diet is essential for the general functioning of the immune system, there is no clear correlation between food and Kawasaki disease. The immune system may be strengthened and the risk of diseases linked to inflammation decreased with a diet high in vitamins, antioxidants, and anti-inflammatory foods.

Lifestyle Factors: Although Kawasaki disease is not known to be caused by any particular lifestyle factors, maintaining excellent hygiene, such as washing your hands frequently and avoiding contact with infectious people, can help lower your risk of contracting infections that could cause the illness.

Who is Affected More

- Most of the kids are between the ages of six months and five. More Asian children, particularly Japanese and Korean ones, are impacted than girls.
- Seasonally peaks throughout the world, usually in the winter and spring.

Signs and Symptoms



Phases

The disease happens in 3 phases:

A. Acute Phase (0–2 weeks)

Over five days of high fever ($\geq 102^{\circ}\text{F}$ or 39°C); red, pus-free eyes (conjunctivitis); and red, cracked lips and "strawberry tongue"

- Red rash on the arms, legs, trunk, and diaper area
- Red, swollen hands and feet
- Swollen lymph nodes, typically larger than 1.5 cm in the neck

B. Sub-acute Phase (2–4 weeks)

- Joint discomfort and swelling;
- Skin peeling from fingers and toes;
 - Irritability (kid cries a lot or is fussy) Diarrhea, vomiting, or abdominal pain
- Heart issues could manifest

C. Convalescent Phase (4–8 weeks)

Blood tests may still reveal inflammation; symptoms may gradually subside; and, if left unchecked, cardiac damage may persist.

Clinical Evaluation:

Physical Examination and Patient History: The physician will go over the child's physical examination results, medical history, and symptoms. The diagnosis depends on key indications like rash, enlarged lymph nodes, and a protracted fever.

Tests for diagnosis:

Since there are no reliable laboratory tests to confirm Kawasaki Disease, the diagnosis is made entirely solely on the patient's clinical presentation. Usually, the diagnostic procedure consists of:

Blood testing: Erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP), which are frequently increased in Kawasaki disease, are two examples of the inflammatory levels that can be measured by blood testing.

- Elevated white blood cells, which signify an immunological response, can also be seen in a complete blood count (CBC).

Tests for Urine:

- Traces of white blood cells or protein, which are prevalent in Kawasaki disease, may be seen in urinalysis.
- Echocardiogram: An echocardiogram, or ultrasound of the heart, is performed to check for damage or aneurysms in the heart and coronary arteries. Given that Kawasaki Disease can result in major cardiac problems, this is an essential step in the diagnosis process.
- Electrocardiogram (ECG): If cardiac involvement is suspected, an ECG may be used to track the heart's electrical activity.

Medical Treatments:**Intravenous Immunoglobulin (IVIG):**

The main treatment for Kawasaki disease is IVIG. It is administered intravenously to assist lessen fever, inflammation, and the risk of cardiac problems such coronary artery aneurysms. When administered within the first 10 days of the illness, IVIG treatment usually has the best results.

Aspirin Therapy:

Aspirin is used to reduce inflammation and lower fever. It also helps prevent blood clotting, which is important in preventing the formation of blood clots in the coronary arteries. Low-dose aspirin is used during the acute phase, but it is typically stopped once the fever subsides.

Steroids:

In severe cases, or when the disease does not respond to IVIG, corticosteroids may be used to reduce inflammation.

Other Immunosuppressive Agents:

In some cases, other medications such as infliximab (a monoclonal antibody) may be used for patients who do not respond to traditional treatments.

Non-Pharmacological Treatments:

Hydration and Rest:

Adequate hydration and rest are essential for recovery. Fluids are given to prevent dehydration, especially in children who may have reduced fluid intake due to fever or irritation.

Pain Relief:

Over-the-counter pain relievers, such as acetaminophen, may be used to manage discomfort during the acute phase. However, ibuprofen is typically avoided due to its potential interaction with aspirin.

Cardiac Monitoring:

Children diagnosed with Kawasaki Disease should be monitored closely for heart issues, including regular echocardiograms to assess coronary artery health.

Complications

Short-Term Complications	Long-Term Complications
Coronary Artery Aneurysms: The development of aneurysms in the coronary arteries is the most severe consequence of Kawasaki disease. Heart attacks or other serious cardiovascular issues may result from this. Heart Failure: In extreme situations, Kawasaki Disease's inflammation can damage the heart muscle, resulting in heart failure. Gastrointestinal Problems: Dehydration and worsening of the disease's symptoms might result from gastrointestinal problems that some children may encounter, such as vomiting, diarrhea, or abdominal discomfort.	Long-Term Heart Damage: Adult heart attacks and coronary artery disease are among the long-term heart issues that children with Kawasaki disease are more likely to experience. Chronic Arthritis: Kawasaki disease can induce joint discomfort or arthritis in certain kids.

II. Conclusion

Kawasaki disease is an acute, self limiting vasculitis of childhood that mainly affects medium sized arteries , particularly the coronary arteries .Early recognition and treatment with intravenous immunoglobulin(IVIG) and aspirin are crucial to reduce the risk of coronary artery complications .With timely intervention , most children recover fully , but delayed or untreated cases can lead to serious long term cardiac issues .

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