KAWASAKI DISEASE: A CASE SERIES

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DAILY NATION

When the doctor hits a wall: The tragic story of Ian Bore

OPEN

OBJECTIVES

- Highlight the cases of Kawasaki Disease (KD) as seen in Aga Khan Hospital 2012- 2017
- Underline the diagnostic criteria for complete and incomplete KD
- Discuss evidence-based approach to management of KD

OUTLINE:

- Introduction
- Diagnostic Criteria
- Findings:
  - Demographic Data
  - Signs and Symptoms
  - Lab Findings
  - ECHO Findings
- Approach to management

DEFINITION:

- Vasculitides of childhood with predilection for the coronary arteries
  - Up to 20-25% affected if untreated

- Highest incidence reported in Asian children
  - annual incidence rate of 264.8 per 100 000 population aged 0-4 years reported in 2012

Descriptive Epidemiology of Kawasaki Disease in Japan, 2011-2012
Council on Cardiovascular Disease in the Young, American Heart 2004;114(6):1708.

DIAGNOSTIC CRITERIA:

- Fever ≥5 days + at least **four** of:
  - Conjuctivitis
  - Oral mucous membrane changes
  - Peripheral extremity changes
  - Polymorphous rash
  - Cervical lymphadenopathy

*without an alternative explanation

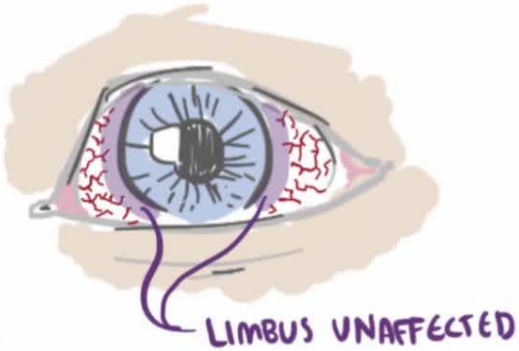
International Journal of Rheumatic Disease/ Vol 21,Issue 1
Kawasaki T Arerugi. 1967;16(3):178.

DIAGNOSTIC CRITERIA

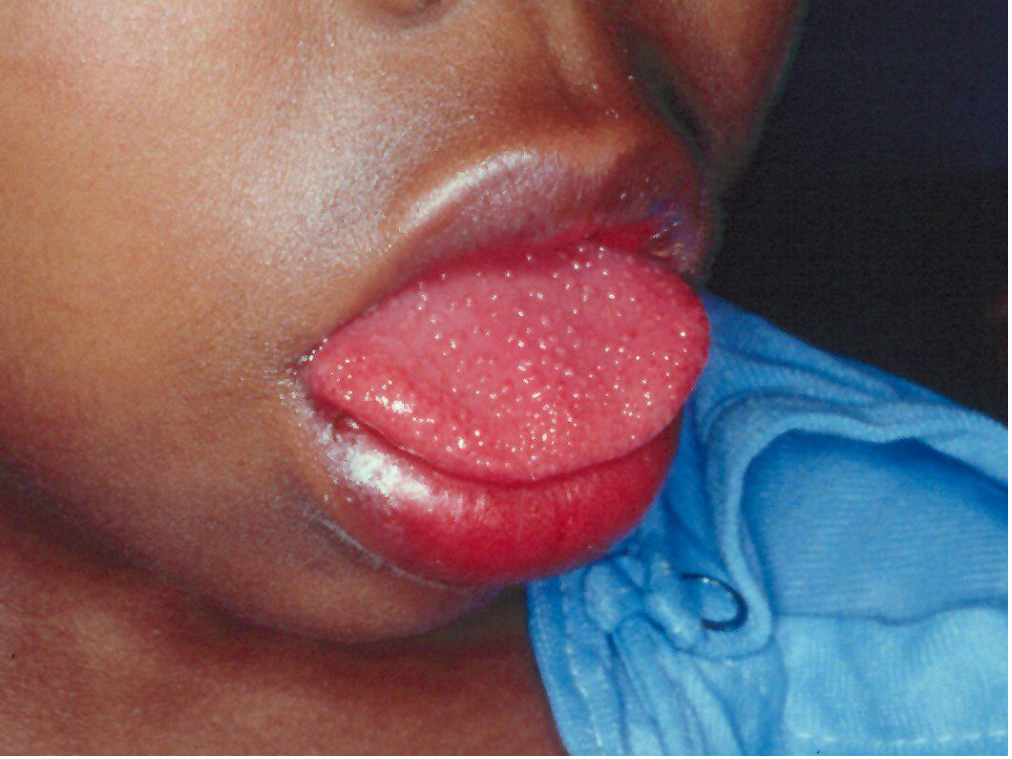
KAWASAKI DISEASE

* CLASSIC SYMPTOMS *

- **C**onjunctivitis (spares limbus)
- **R**ash ~ all body parts
  Polymorphous → desquamation (flakes)
- **A**denopathy ~ enlarged lymph nodes (cervical)
- **S**trawberry tongue ~  RED + MOUTH & THROAT
- **H**ands & feet ~ Swollen + rash



Credit: Osmosis



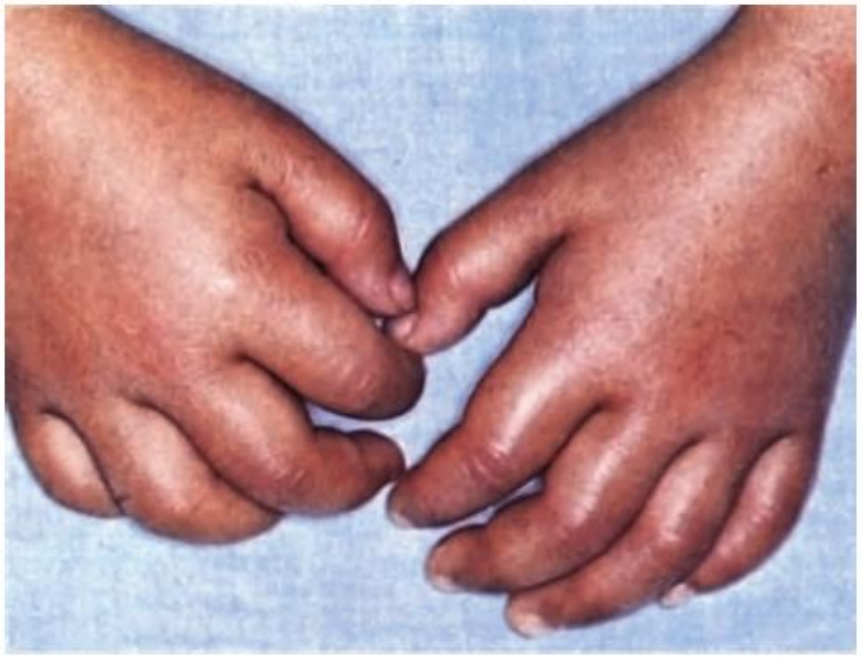


Figure 166-4 Indurative edema of the hands in mucocutaneous lymph node syndrome (Kawasaki disease). *(Courtesy of Tomisaku Kawasaki, MD. From Hurwitz S:* Clinical pediatric dermatolog *Philadelphia, 1993, Saunders.)*

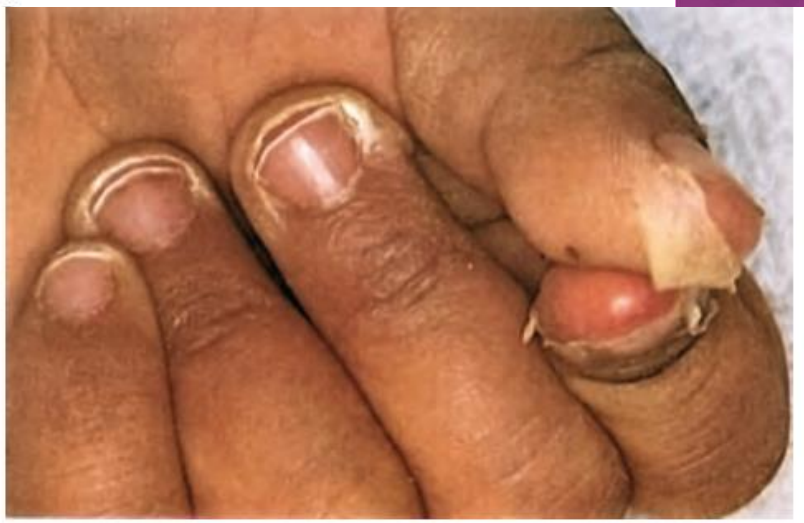
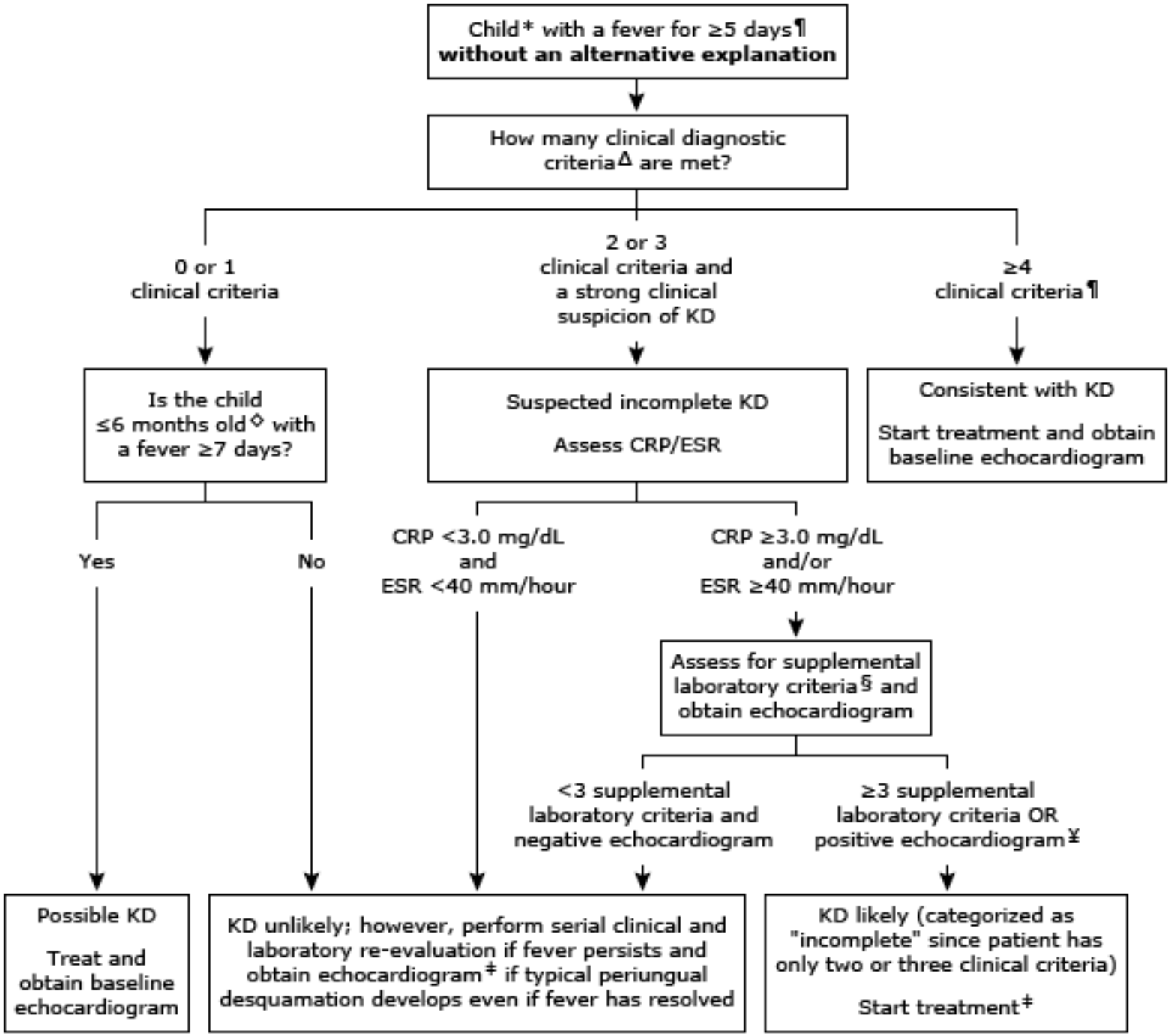


Figure 166-5 Desquamation of the fingers in a patient with mucocutaneous lymph node syndrome (Kawasaki disease). *(Courtesy of Tomisaku Kawasaki, MD. From Hurwitz S:* Clinical pediatric dermatology, *ed 2, Philadelphia, 1993, Saunders.)*

Nelson's Textbook of Pediatrics, 20th Edition

DIAGNOSTIC CRITERIA

- Patients with fever at least 5 days and < 4 principal criteria
  - can be diagnosed with KD when coronary artery abnormalities are detected
  - In the absence of this, diagnosis of **incomplete KD** can be made
  - Evaluate ESR/CRP
  - Evaluate other supporting labs

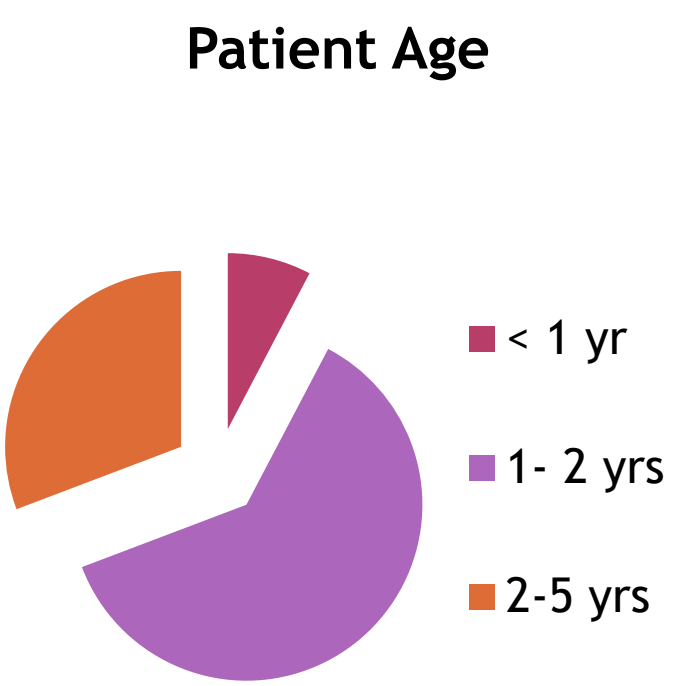

Child* with a fever for ≥5 days¶
without an alternative explanation
How many clinical diagnostic criteria Δ are met?
0 or 1 clinical criteria
2 or 3 clinical criteria and a strong clinical suspicion of KD
≥4 clinical criteria¶
Is the child ≤6 months old ◇ with a fever ≥7 days?
Suspected incomplete KD
Assess CRP/ESR
Consistent with KD
Start treatment and obtain baseline echocardiogram
Yes
No
CRP <3.0 mg/dL and ESR <40 mm/hour
CRP ≥3.0 mg/dL and/or ESR ≥40 mm/hour
Assess for supplemental laboratory criteria § and obtain echocardiogram
<3 supplemental laboratory criteria and negative echocardiogram
≥3 supplemental laboratory criteria OR positive echocardiogram ¥
Possible KD
Treat and obtain baseline echocardiogram
KD unlikely; however, perform serial clinical and laboratory re-evaluation if fever persists and obtain echocardiogram ‡ if typical periungual desquamation develops even if fever has resolved
KD likely (categorized as "incomplete" since patient has only two or three clinical criteria)
Start treatment ‡

DEMOGRAPHIC DATA

- 13 patients seen from Jan 2013 to Dec 2017

CHARACTERISTICS		
Gender	Male (n 7, 53.8%)	Female (n 6, 46.1%)
Nationality	Kenyan (n 10, 76.9%)	Other African nationality (n 3, 23.1%)
Age	Mean (2 yrs)	Range (11 months- 5 years)
Duration of symptoms at presentation	Mean (7.1 days)	Range (1- 10 days)
Duration of admission	Mean (4.6 days)	Range (2 days - 7 days)

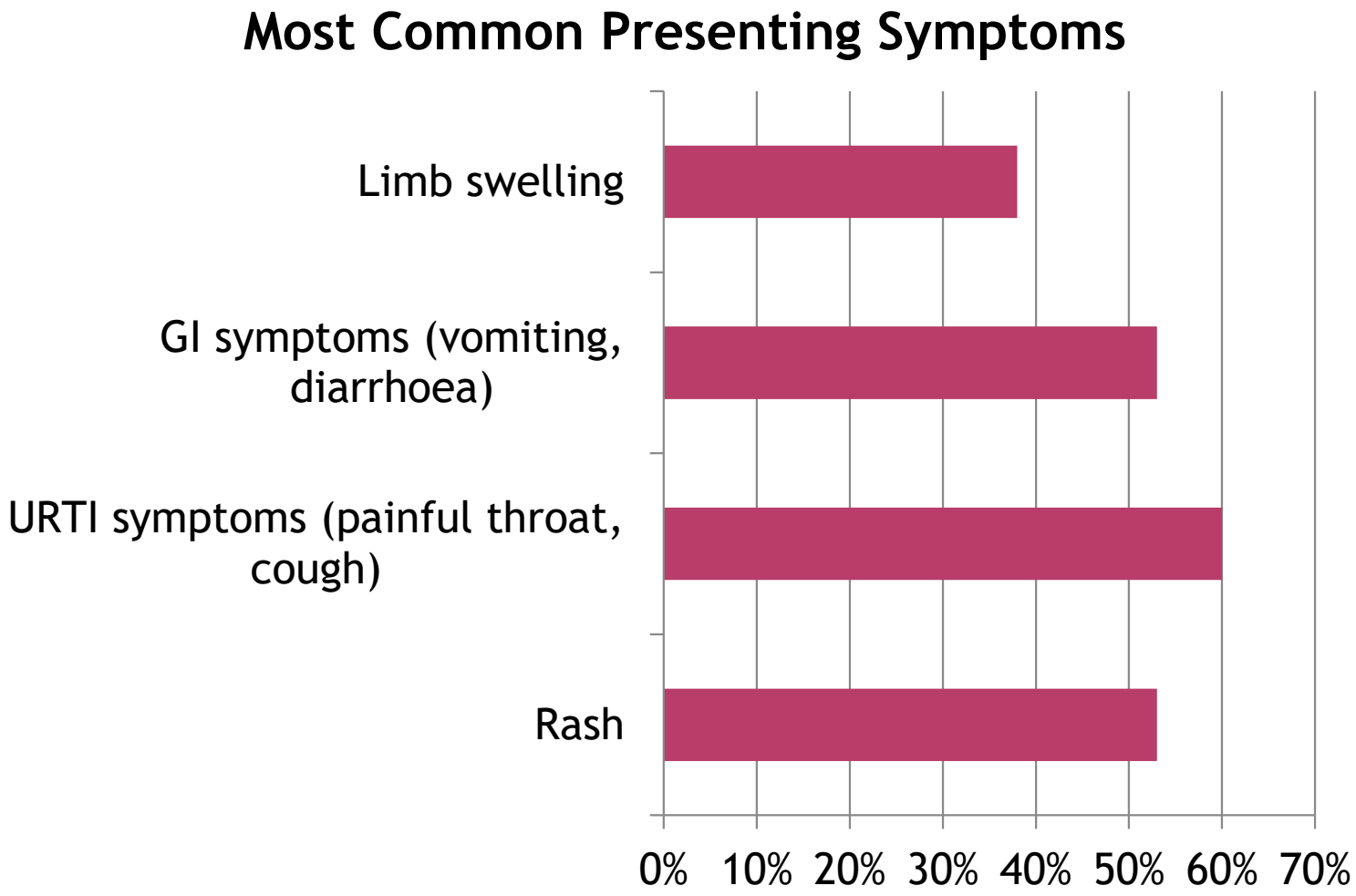
DEMOGRAPHIC DATA



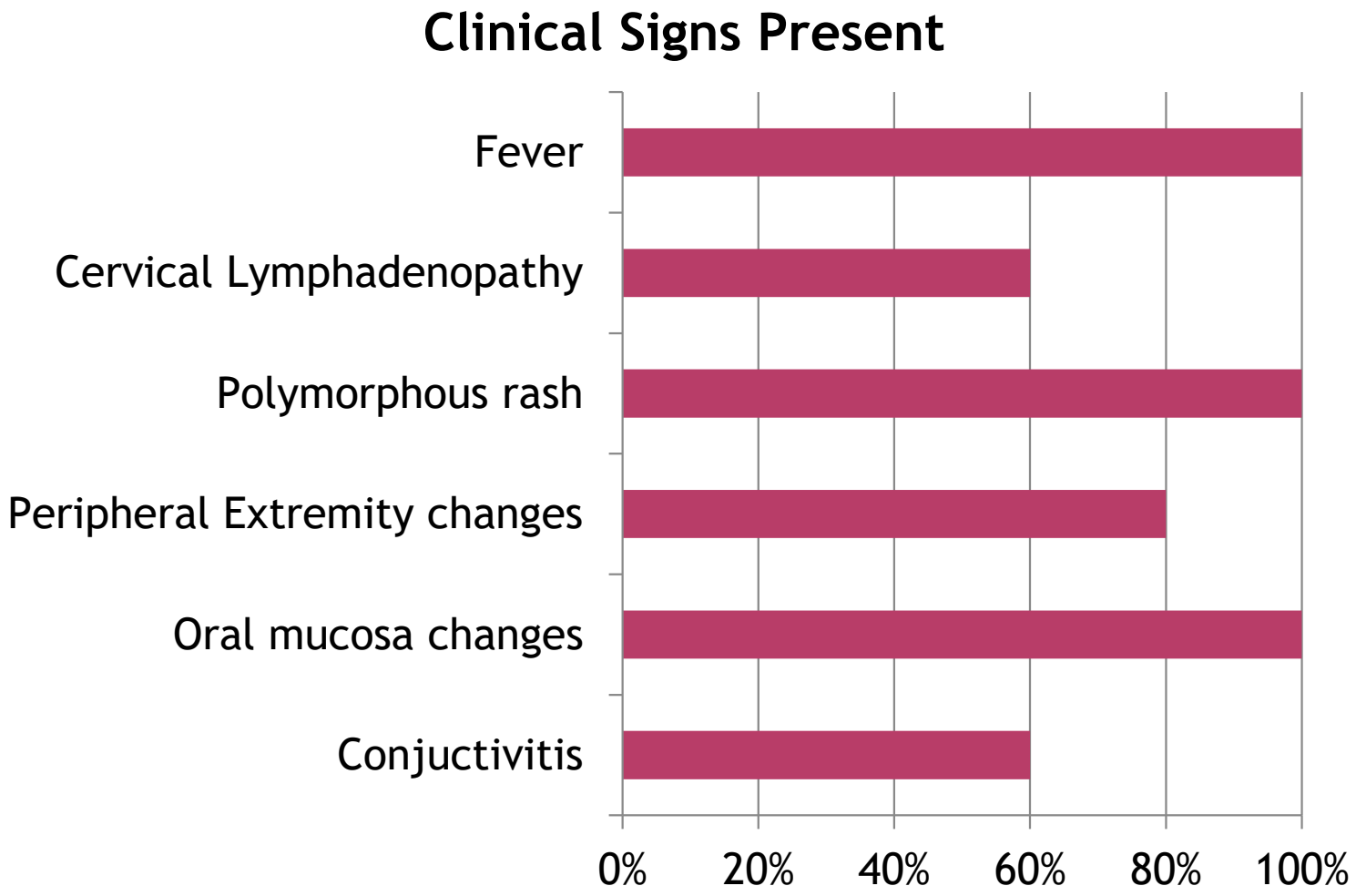
- Most patients were between 1 and 2 years of age
- Infants ≤6 months of age with KD more likely to lack clinical features of KD other than fever and at increased risk for coronary artery aneurysm

Korean J Pediatr. 2013 Sep;56(9):377-82. Epub 2013 Sep 30.

SYMPTOMATOLOGY:



CLINICAL SIGNS PRESENT



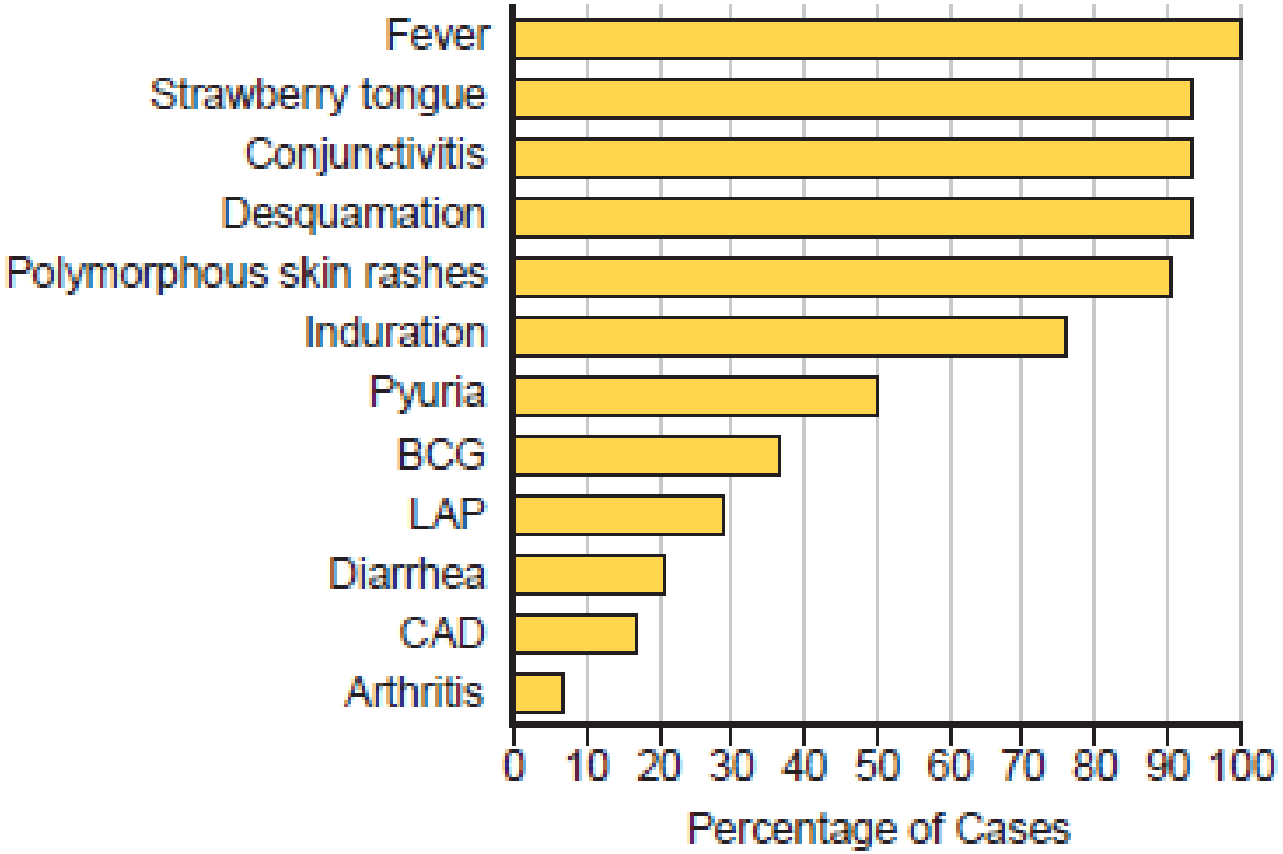


Figure 166-1 Clinical symptoms and signs of Kawasaki disease. A summary of the clinical features from 110 cases of Kawasaki disease seen in Kaohsiung, Taiwan. LAP, lymphadenopathy in head and neck area; BCG, reactivation of bacille Calmette-Guérin inoculation site; CAD, coronary artery dilation, defined by an internal diameter >3 mm. *(From Wang CL, Wu YT, Liu CA, et al: Kawasaki disease: infection, immunity and genetics,* Pediatr Infect Dis J *24:998–1004, 2005.)*

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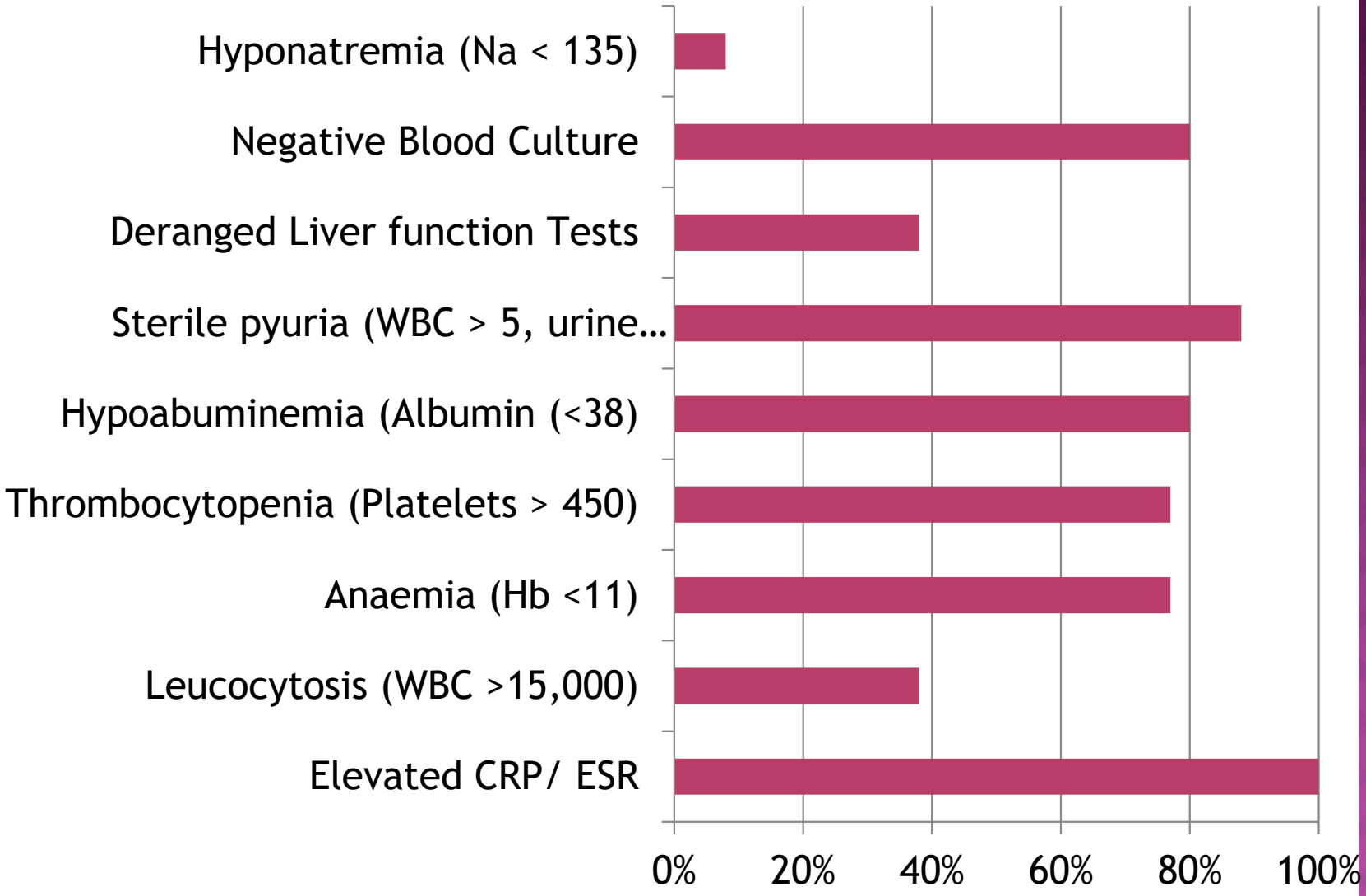
COMPLETE VS. INCOMPLETE KD

- 61% (n 8) had **complete KD** with fever + **at least 4 out of 5** of the diagnostic criteria

- Incomplete KD:
  - fever for more than **5 days and 2-3 compatible clinical criteria**
  - Infants with **fever more than 7 days without any other explanation**

Lab Findings



ECHO FINDINGS:

- 12 patients had ECHOs done during admission
- Only one patient was found to have abnormal findings: coronaries dilated bilaterally, the LAD has saccular dilatations measuring 5 mm.
- 5 patients had at least one documented repeat ECHO

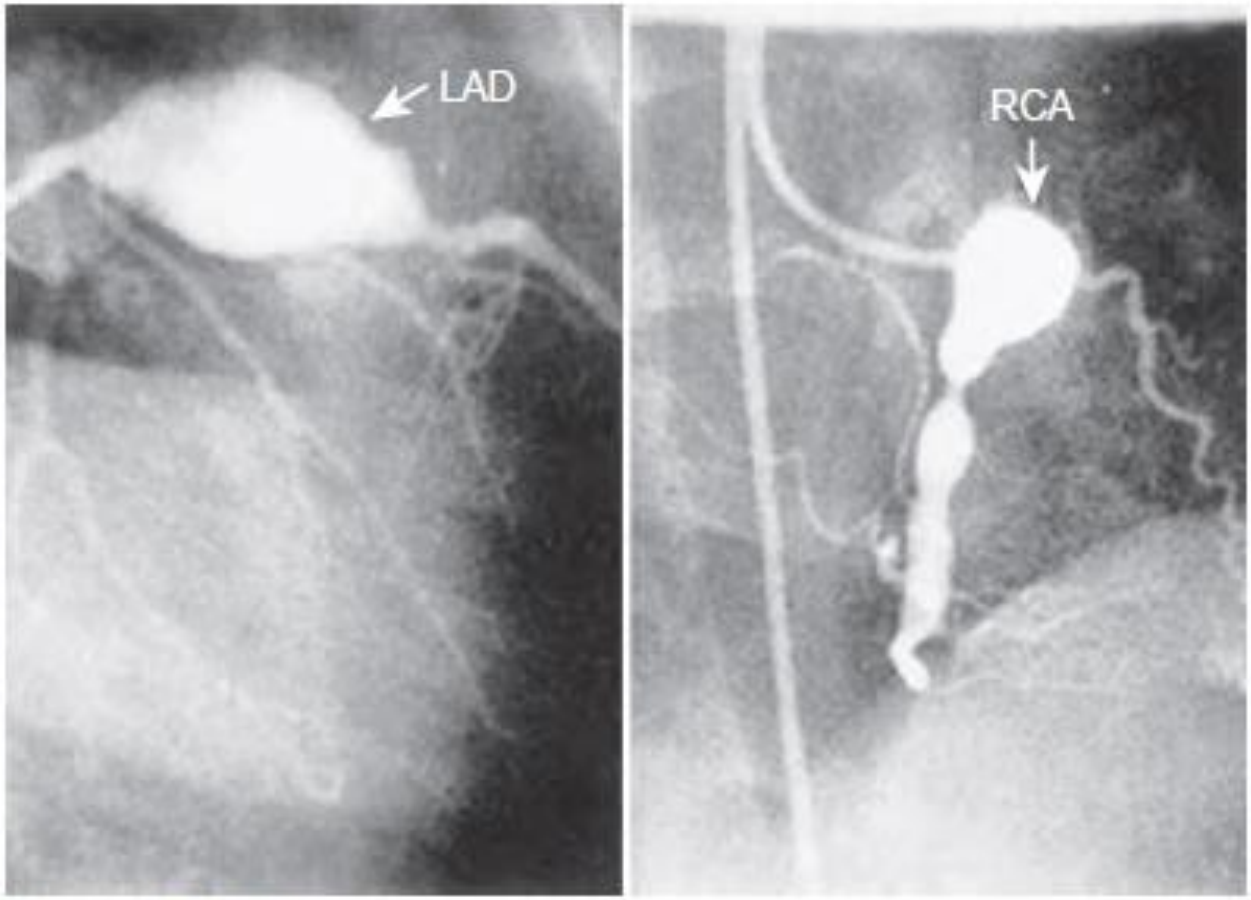


Figure 166-6 Coronary angiogram demonstrating giant aneurysm of the left anterior descending coronary artery (LAD) with obstruction and giant aneurysm of the right coronary artery (RCA) with an area of severe narrowing in 6 yr old boy. *(From Newburger JW, Takahashi M, Gerber MA, et al: Diagnosis, treatment, and long-term management of Kawasaki disease,* Pediatrics *114:1708–1733, 2004.)*

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CARDIOVASCULAR SEQUELAE

- CAA (Coronary Artery abnormalities) develop in up to 25% of untreated patients in the 2nd to 3rd wk of illness.
- Myocarditis
- Cardiogenic shock (KD shock syndrome)
- Pericarditis
- Mitral regurgitation
- Axillary, popliteal, iliac, or other arteries may also become dilated

American College of Cardiology Scientific Statement on Kawasaki Disease

CLINICAL COURSE:

- All 13 patients received IV Immunoglobulin- 12 responded to treatment
- No adverse effects were reported after treatment
- One patient did not improve and needed a second dose of IVIg and Methyl prednisone (30mg/kg IV)

IVIG RESISTANT KD

- **IVIG-resistant KD occurs in approximately 15% of patients**
  - defined by persistent or recrudescent fever 36 hr after completion of the initial IVIG infusion.
  - These patients are at increased risk for CAA.
- Typically, another dose of IVIG at 2 g/kg is administered
- Corticosteroids have also been used as secondary or “rescue” therapy when fever persists.

JAMA Pediatr. 2016;170(12):1140.

ASPRIN:

- All 13 patients received aspirin but dosing varied from high (80-90 mg/kg/day) to moderate (30-50 mg/kg/day) to low dose (3 mg/kg/day)

- One patient on high dose asprin was noted to have developed symptoms consistent with asprin induced bronchospasm; changed to low dose

LOW DOSE VS. HIGH DOSE

- The American Academy of Pediatrics (AAP) and American Heart Association (AHA) have recommended a broad range of aspirin doses (30 to 100 mg/kg/day)
- Several retrospective studies have examined different asprin doses - no differences noted in the rate of coronary artery abnormalities
- One study however reported higher odds of IVIg resistance in the low dose asprin cohort (odds ratio: 3.2, 95% CI 1.1-9.1)

Pediatrics. 2017;139(6) Epub 2017 May 2. .

ANTIBIOTIC USE

- 9 patients were concurrently treated with IV antibiotics. Choice of antibiotics included: ceftriaxone, ciprofloxacin

- One positive blood culture:
  - Staph Hemolyticus susceptible to Clindamycin and Vancomycin

ADJUVANT THERAPY:

- 2 patients received 3 doses of Albumin at 0.5-1g/kg/ dose x 3/7
  - Had serum levels of 20 g/L, 23 g/L
  - Clinically had swelling of the extremities
- Hypoalbuminemia is a useful prognostic marker

- Albumin infusion has been performed in the early stage of acute KD, especially when edema is extensive, but effects of albumin infusion on KD outcome are untested.

Prog Clin Biol Res. 1987;250:535–537.Kawasaki Disease.

IN SUMMARY…

- High index of suspicion needed
  - younger patients are more likely to have incomplete KD but are also at higher risk of coronary arteriopathy
- Diagnosis is clinical. Investigations serve to:
  - rule out differentials
  - support diagnosis especially in incomplete KD
  - monitor response

IN SUMMARY…

- Morbidity mainly secondary to coronary artery pathology
  - ECHO should be done at presentation and repeated 2-3 weeks and 4-6 weeks after treatment
- Low dose asprin just as effective as high doses, less risk of adverse effects
- Up to a third of patients may have concurrent infections