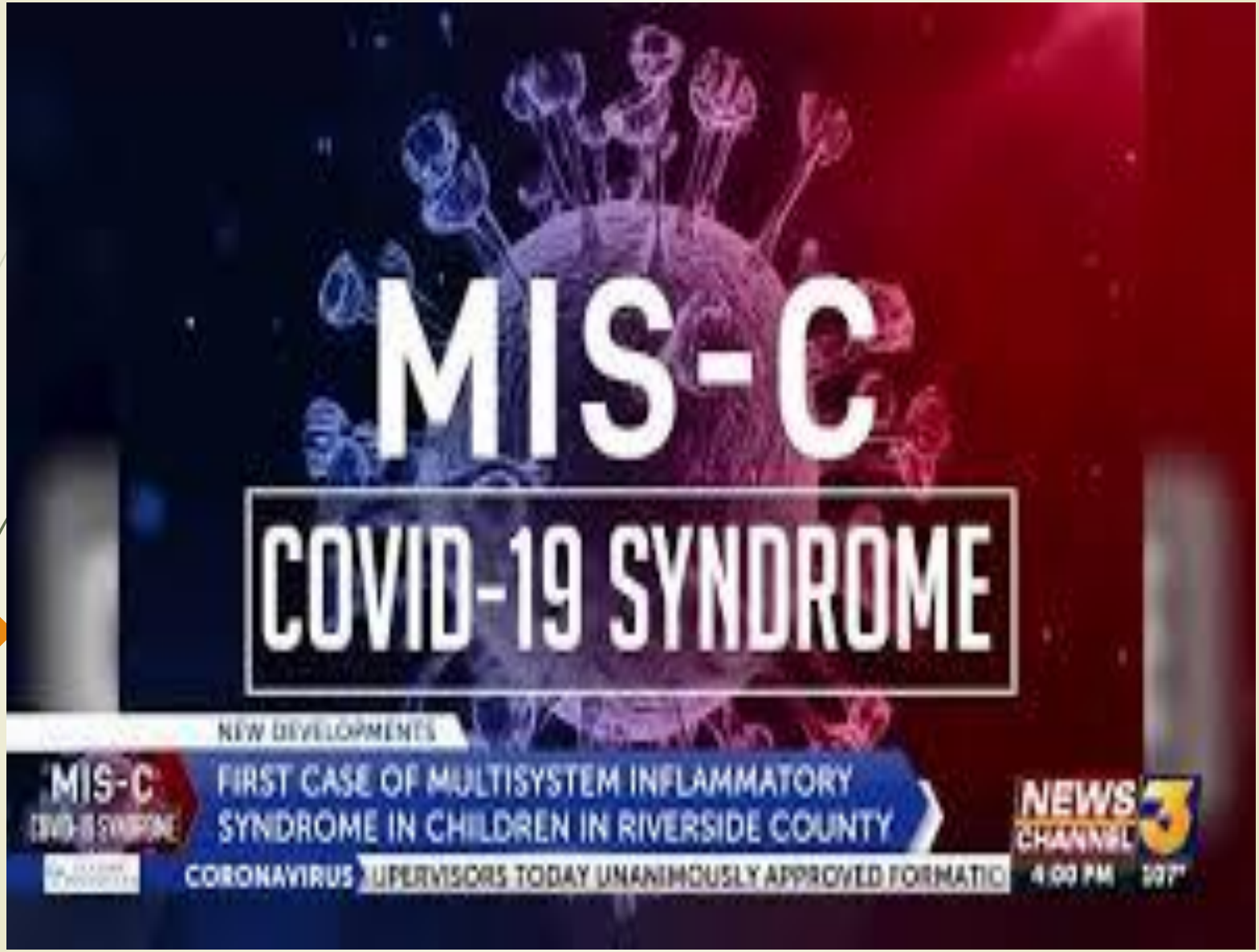

MIS-C
COVID-19 SYNDROME
NEW DEVELOPMENTS
MIS-C
FIRST CASE OF MULTISYSTEM INFLAMMATORY SYNDROME IN CHILDREN IN RIVERSIDE COUNTY
CORONAVIRUS
SUPERVISORS TODAY UNANIMOUSLY APPROVED FORMATIC
NEWS 3
CHANNEL
4:00 PM

Coronavirus disease 2019 (COVID-19): Multisystem inflammatory syndrome in children (MIS-C)

Dr.Dorreh

In children, COVID-19 is usually mild.

in rare cases, children can be severely affected.

April of 2020, reports from the United Kingdom documented a presentation in children similar to incomplete Kawasaki disease (KD) or toxic shock syndrome.

in children (***MIS-C;*** also referred to as pediatric multisystem inflammatory syndrome [***PMIS***], pediatric inflammatory multisystem syndrome temporally associated with SARS-CoV-2 [***PIMS-TS]***, pediatric hyperinflammatory syndrome, or pediatric hyperinflammatory shock)

EPIDEMIOLOGY

incidence of MIS-C is uncertain, it appears to be a rare

. In one report, the estimated incidence of laboratory-confirmed SARS-CoV-2 infection in individuals <21 years old was 322 per 100,000

the incidence of MIS-C was 2 per 100,000

EPIDEMIOLOGY

Most MIS-C cases have occurred in previously healthy>70 percent

Black and Hispanic

. The median age was 8 to 11 years (range 1 to 20 years

. a lag of several weeks between the peak of COVID-19 cases and the rise of MIS-C cases

PATHOPHYSIOLOGY

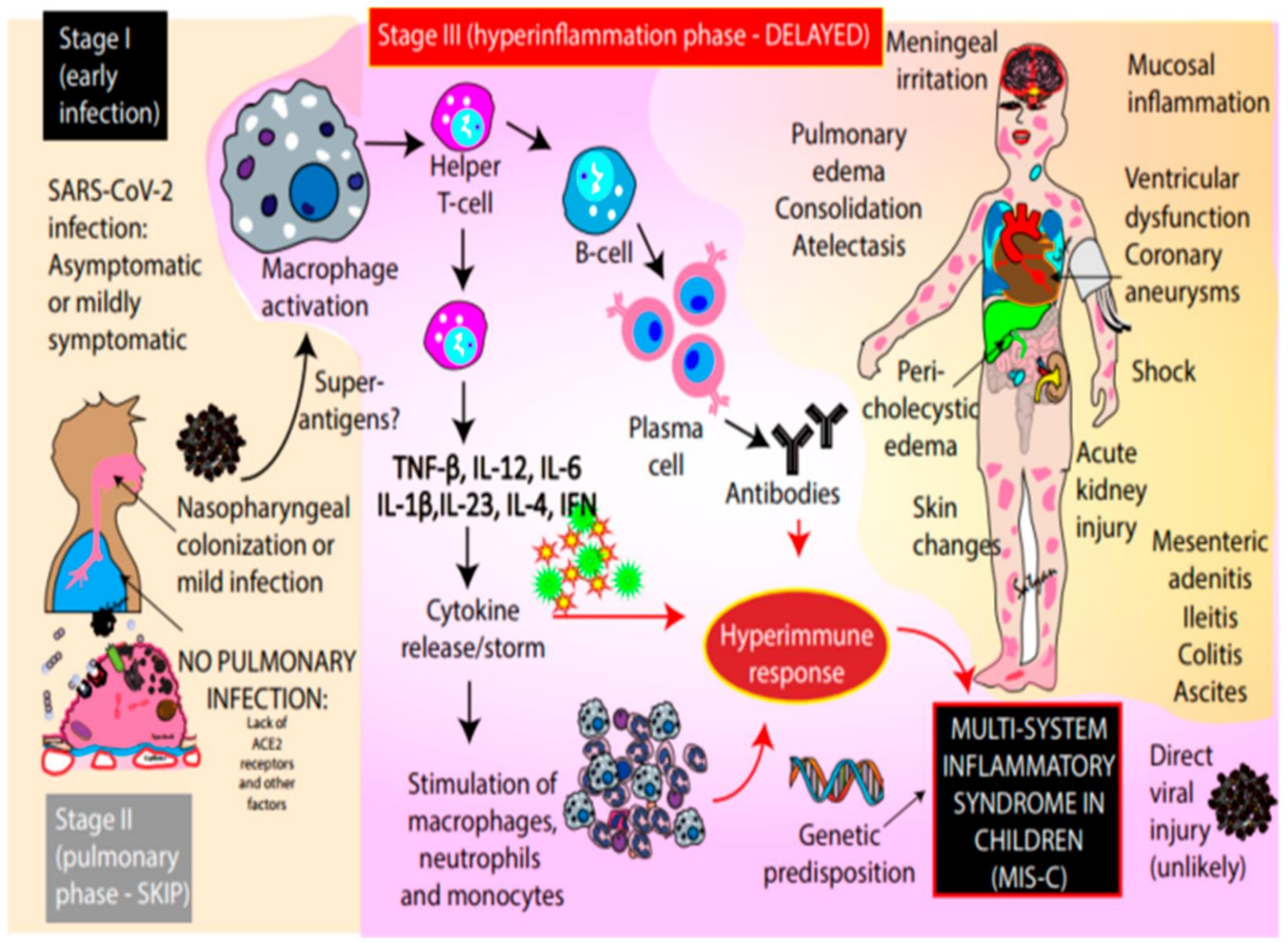
60 percent had positive serology with negative PCR,

34 percent were positive on both tests,

and 5 percent were negative on both tests.

abnormal inflammatory response or Immune dysregulation

A post-infectious process is suggested,


Stage I (early infection)
SARS-CoV-2 infection: Asymptomatic or mildly symptomatic
Nasopharyngeal colonization or mild infection
NO PULMONARY INFECTION:
Lack of ACE2 receptors and other factors
Stage II (pulmonary phase - SKIP)
Super-antigens?
Macrophage activation
Stage III (hyperinflammation phase - DELAYED)
Helper T-cell
B-cell
TNF-β, IL-12, IL-6
IL-1β,IL-23, IL-4, IFN
Cytokine release/storm
Stimulation of macrophages, neutrophils and monocytes
Plasma cell
Antibodies
Hyperimmune response
Genetic predisposition
MULTI-SYSTEM INFLAMMATORY SYNDROME IN CHILDREN (MIS-C)
Direct viral injury (unlikely)
Meningeal irritation
Mucosal inflammation
Pulmonary edema
Consolidation
Atelectasis
Ventricular dysfunction
Coronary aneurysms
Shock
Peri-cholecystic edema
Acute kidney injury
Skin changes
Mesenteric adenitis
Ileitis
Colitis
Ascites

CLINICAL MANIFESTATIONS

Persistent fevers (median duration four to six days) – 100 percent

Gastrointestinal symptoms (abdominal pain, vomiting, diarrhea) – 60 to 100 percent

Rash – 45 to 76 percent

Conjunctivitis – 30 to 81 percent

Mucous membrane involvement – 27 to 76 percent

Neurocognitive symptoms (headache, lethargy, confusion) – 29 to 58 percent

Respiratory symptoms – 21 to 65 percent

Sore throat – 10 to 16 percent

Myalgia – 8 to 17 percent

Swollen hands/feet – 9 to 16 percent

Lymphadenopathy – 6 to 16 percent

Clinical finding:

Criteria met for complete Kawasaki disease (KD) 22 to 64 percent

- Myocardial dysfunction (by echocardiogram and/or elevated troponin or brain natriuretic peptide [BNP]) – 51 to 90 percent

- Shock – 32 to 76 percent

Arrhythmia – 12 percent

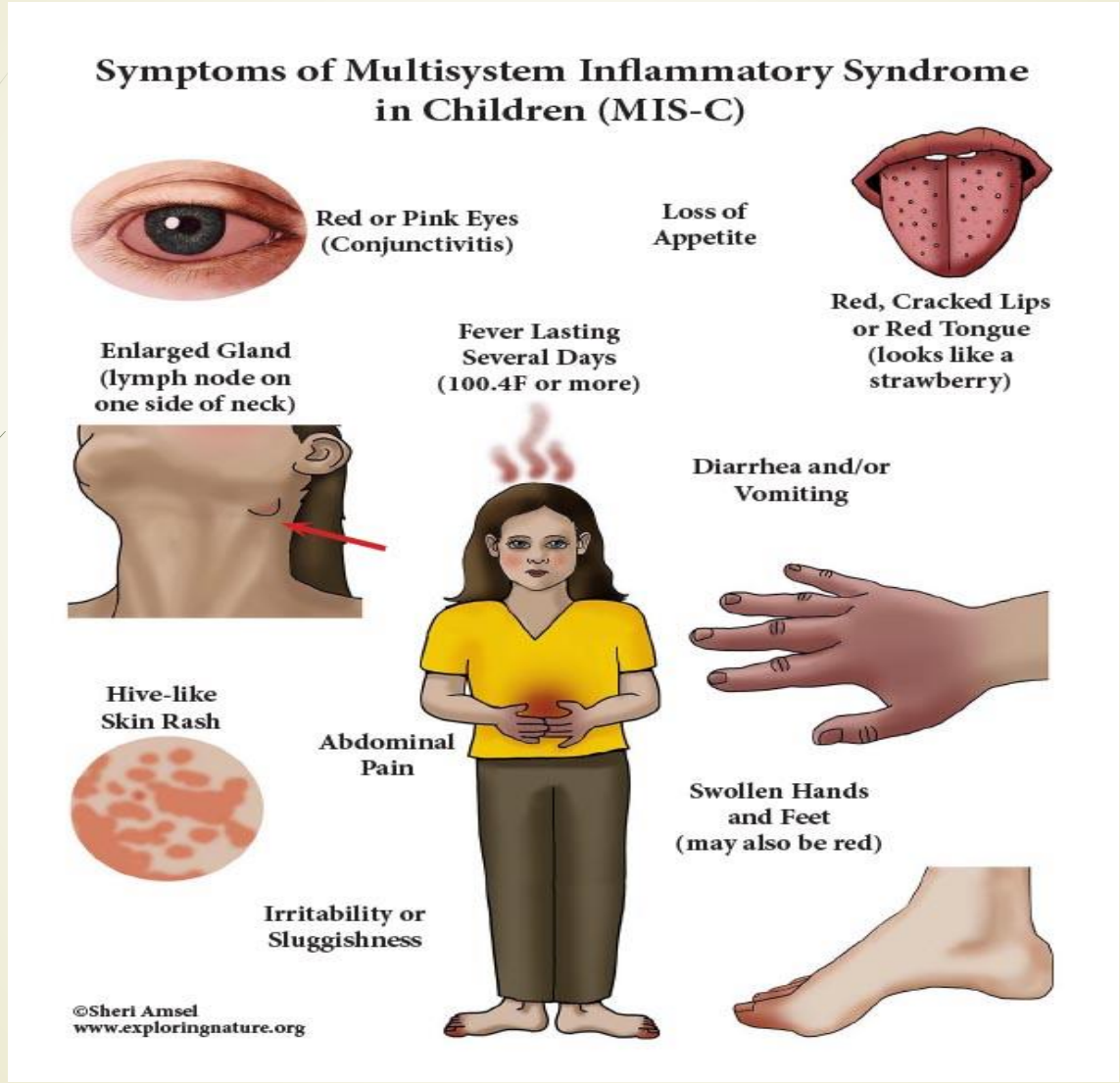
- Acute respiratory failure requiring noninvasive or invasive ventilation – 28 to 52 percent

- Acute kidney injury (most cases were mild) – 8 to 52 percent

- Serositis (small pleural, pericardial, and ascitic effusions) – 24 to 57 percent

- Hepatitis or hepatomegaly – 5 to 21 percent

- Encephalopathy, seizures, coma, or meningoencephalitis – 6 to 7 percent


Symptoms of Multisystem Inflammatory Syndrome in Children (MIS-C)
Red or Pink Eyes (Conjunctivitis)
Loss of Appetite
Red, Cracked Lips or Red Tongue (looks like a strawberry)
Enlarged Gland (lymph node on one side of neck)
Fever Lasting Several Days (100.4F or more)
Diarrhea and/or Vomiting
Hive-like Skin Rash
Abdominal Pain
Swollen Hands and Feet (may also be red)
Irritability or Sluggishness
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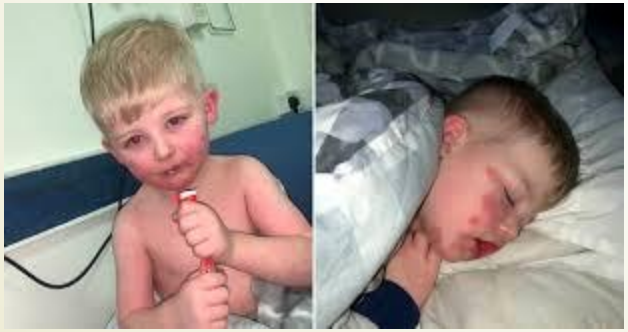


Laboratory findings:

Abnormal blood cell counts, including:

Lymphocytopenia – 80 to 95 percent

Neutrophilia – 68 to 90 percent

- Mild anemia – 70 percent

- Thrombocytopenia – 31 to 80 percen

Laboratory findings:

Elevated inflammatory markers, including:

C-reactive protein (CRP) – 90 to 100 percent

- Erythrocyte sedimentation rate – 75 to 80 percent
- D-dimer – 67 to 100 percent
- Fibrinogen – 80 to 100 percent
- Ferritin – 55 to 76 percent
- Procalcitonin – 80 to 95 percent
- Interleukin-6 (IL-6) – 80 to 100 percent

Laboratory findings:

Elevated cardiac markers:

- Troponin – 50 to 90 percent
- BNP or N-terminal pro-BNP (NT-pro-BNP) – 73 to 90 percent
- Hypoalbuminemia – 48 to 95 percent
- Mildly elevated liver enzymes – 62 to 70 percent
- Elevated lactate dehydrogenase – 10 to 60 percent
- Hypertriglyceridemia – 70 percent

Echocardiography

Depressed LV function

- Coronary artery (CA) abnormalities, including dilation or aneurysm
- Mitral valve regurgitation
- Pericardial effusion

Imaging finding

Chest radiograph – Many patients had normal chest radiographs. Abnormal findings included pleural effusions, patchy consolidations, focal consolidation, and atelectasis

Computed tomography (CT) of chest – Chest CT (when obtained) generally had findings similar to those on chest radiograph. A few patients had nodular ground-glass opacification.

abdominal ultrasound or CT included free fluid, ascites, and bowel and mesenteric inflammation including terminal ileitis, mesenteric adenopathy/adenitis, and pericholecystic edema

EVALUATION

Mild symptoms

- CBC with differential
- CRP
- Serum electrolytes and renal function test

EVALUATION

moderate to severe symptoms:

- Complete blood count (CBC) with differential
- C-reactive protein (CRP) and erythrocyte sedimentation rate (optional: procalcitonin)
- Ferritin
- Liver function tests and lactate dehydrogenase
- Serum electrolytes and renal function tests
- Urinalysis

Coagulation studies Troponin

Brain natriuretic peptide (BNP) or N-terminal pro-BNP (NT-pro-BNP)

- Cytokine panel

Testing for other pathogens

- Blood culture
- Urine culture
- Throat culture
- Stool culture
- Nasopharyngeal aspirate or throat swab for respiratory viral panel
- Epstein-Barr virus serology and PCR
- Cytomegalovirus serology and PCR
- Enterovirus PCR
- Adenovirus PCR

Spectrum of disease

the spectrum of COVID-19-associated disease ranges from mild to severe.

MIS-C without overlap with acute COVID-19 or Kawasaki disease (KD)

35 percent

Nearly all patients in this group had cardiovascular and gastrointestinal involvement

one-half had ≥4 additional organ systems involved. shock, cardiac dysfunction

markedly elevated C-reactive protein (CRP) and ferritin Nearly all patients in this group had positive SARS-CoV-2 serology (with or without positive polymerase chain reaction [PCR]).

Spectrum of disease

MIS-C overlapping with severe acute COVID-19

30 percent.

Many children in this group presented with respiratory involvement, including cough, shortness of breath, pneumonia, and acute respiratory distress syndrome.

positive SARS-CoV-2 PCR without seropositivity.

The mortality rate was higher in this subgroup compared with the other two subgroups (5.3 versus 0.5 and 0 percent, respectively

older than those with KD-like features and they more commonly have comorbidities.

Spectrum of disease

MIS-C overlapping with KD

35 percent of the cohort.

Children in this group were younger than the other two groups (median age 6 versus 9 and 10 years, respectively).

They more commonly had rash and mucocutaneous involvement and less commonly had shock or myocardial dysfunction.

Approximately two-thirds of patients in this group had positive SARS-CoV-2 serology with negative PCR, and one-third were positive on both tests.

Differentiating MIS-C and Kawasaki disease

MIS-C commonly affects older children and adolescents

- In MIS-C, black and Hispanic children appear to be disproportionally affected and Asian children account for only a small number of cases.

- Gastrointestinal symptoms (particularly abdominal pain) are very common in MIS-C

- Myocardial dysfunction and shock occur more commonly in MIS-C compared with classic KD .

- Inflammatory markers (especially CRP, ferritin, and D-dimer) tend to be more elevated in MIS-C compared with classic KD and KDSS . In addition, absolute lymphocyte and platelet counts tend to be lower in MIS-C compared with KD

- It is unclear if the risk of CA involvement in MIS-C is comparable with the risk in classic KD. Among patients with KD, those with KDSS more frequently have CA abnormalities and intravenous immune globulin (IVIG) resistance compared with those without shock. It is unclear if MIS-C is similar to KDSS in

DIFFERENTIAL DIAGNOSIS

Bacterial sepsis

Kawasaki

Toxic shock syndrome

Appendicitis

Other viral infections

Hemophagocytic lymphohistiocytosis (HLH)/macrophage activation syndrome (MAS)

Systemic lupus erythematosus (SLE)

Vasculitis

Management

Abnormal vital signs (tachycardia, tachypnea

- Shock

Respiratory distress

- Evidence of cardiac involvement (eg, elevated troponin or brain natriuretic peptide, depressed ventricular function or coronary artery [CA] abnormality on echocardiogram, abnormal electrocardiogram)
- Features of Kawasaki disease (KD)

Neurologic changes (eg, depressed mental status, abnormal neurologic examination, seizures)

- Severe abdominal pain or vomiting, especially if unable to tolerate oral feeding

- Clinical or laboratory evidence of dehydration

- Laboratory evidence of acute kidney injury, acute hepatic injury, or coagulopathy

- Underlying medical condition that may place the child at increased risk for complications (eg, immunodeficiency, cardiac or pulmonary conditions)

- Inability to return for followup

Management

Shock

Children presenting with shock should be resuscitated according to standard protocols

most children with MIS-C presented with vasodilatory shock that was refractory to volume expansion.

Epinephrine or norepinephrine are the preferred vasoactive agents for the management of fluid-refractory shock in children. Epinephrine is preferred when there is evidence of left ventricular (LV) dysfunction.

In children presenting with severe LV dysfunction, the addition of milrinone may be helpful.

Management

Features of Kawasaki disease

standard therapies for KD, including IVIG, aspirin, and, if there are persistent signs of inflammation or coronary artery (CA) dilation/aneurysm, glucocorticoids.

As it will be increasingly difficult to distinguish patients with incident KD who have seroconverted from prior SARS Co-V2 infections from patients with MIS-C who meet KD criteria, it is important to intensify treatment if KD high-risk criteria are present.

Management

Cardiac dysfunction

children with cardiac involvement may present with **arrhythmias** and **hemodynamic compromise**.

Serial echocardiographic assessment of cardiac function and monitoring of brain natriuretic peptide and troponin levels can help guide therapy.

Management focuses on supportive care to maintain hemodynamic stability and ensure adequate systemic perfusion. IVIG is often used, though conclusive evidence of benefit is lacking.

Continuous cardiac monitoring is essential so that arrhythmias are promptly detected and treated.

Patients with significant LV dysfunction are treated with intravenous diuretics and inotropic agents, such as milrinone, dopamine, and dobutamine.

In cases of fulminant disease, mechanical hemodynamic support

Management

Antibiotic therapy

Ceftriaxon-vancomycin

Antiviral therapy

Severe MIS-C with active infection

Immune-modifying therapies

Intravenous immune globulin

Management

We recommend IVIG for

1- all patients who meet criteria for complete or incomplete KD

2-Shock

3-Cardiac involvement, including any of the following:

Depressed LV function on echocardiography

CA abnormalities (dilation or aneurysm) on echocardiography

Arrhythmia

Elevated brain natriuretic peptide and/or troponin

4-Other severe manifestations requiring PICU

Management

Glucocorticoid therapy may be given concomitantly with IVIG if severe or life-threatening illness is present. It also may be given as a second-line treatment in patients who do not respond to IVIG.

- Dosing – Glucocorticoid therapy is initially given intravenously (IV) with methylprednisolone at a dose of 2 mg/kg/day in two divided doses .

Once the patient has defervesced and is improved clinically, this can be transitioned to an equivalent oral dose of prednisolone or prednisone by the time of discharge and then tapered off over three to four weeks.

In life-threatening circumstances, pulse doses of glucocorticoids are sometimes used (IV methylprednisolone 30 mg/kg/dose, with a maximum of 1 g)

Management

The benefits and risks of adjunctive therapies (interleukin-1 [IL-1] inhibitors [eg, anakinra, canakinumab], IL-6 inhibitors [eg, tocilizumab], convalescent plasma from recovered COVID-19 patients) are uncertain.

Consultation with pediatric infectious disease and rheumatology specialists is advised.

Management

Antithrombotic therapy

Patients with MIS-C are at risk of experiencing thrombotic complications

For example, patients with severe LV dysfunction are at risk for apical LV thrombus and those with KD who have large or giant CA aneurysms are at risk for myocardial infarction.

In addition, patients may be at risk for venous thromboembolism (VTE), including pulmonary embolus, due to hypercoagulability associated with COVID-19.

Management

Antithrombotic therapy

KD :At a minimum low dose aspirin

LV dysfunction: Moderate to severe

Other patients Is individualized

Management

Patients with mild symptoms who lack KD-like features, shock, and cardiac involvement can be monitored conservatively initially.

However, if the patient's clinical status worsens or they remain persistently febrile with elevated inflammatory markers, including rising ferritin levels, we typically administer IVIG.

outcome

Prognosis is uncertain

In 655 patients with MIS-C there were 11 death.(1.7 %)

Most patient with cardiac involvement had recovery

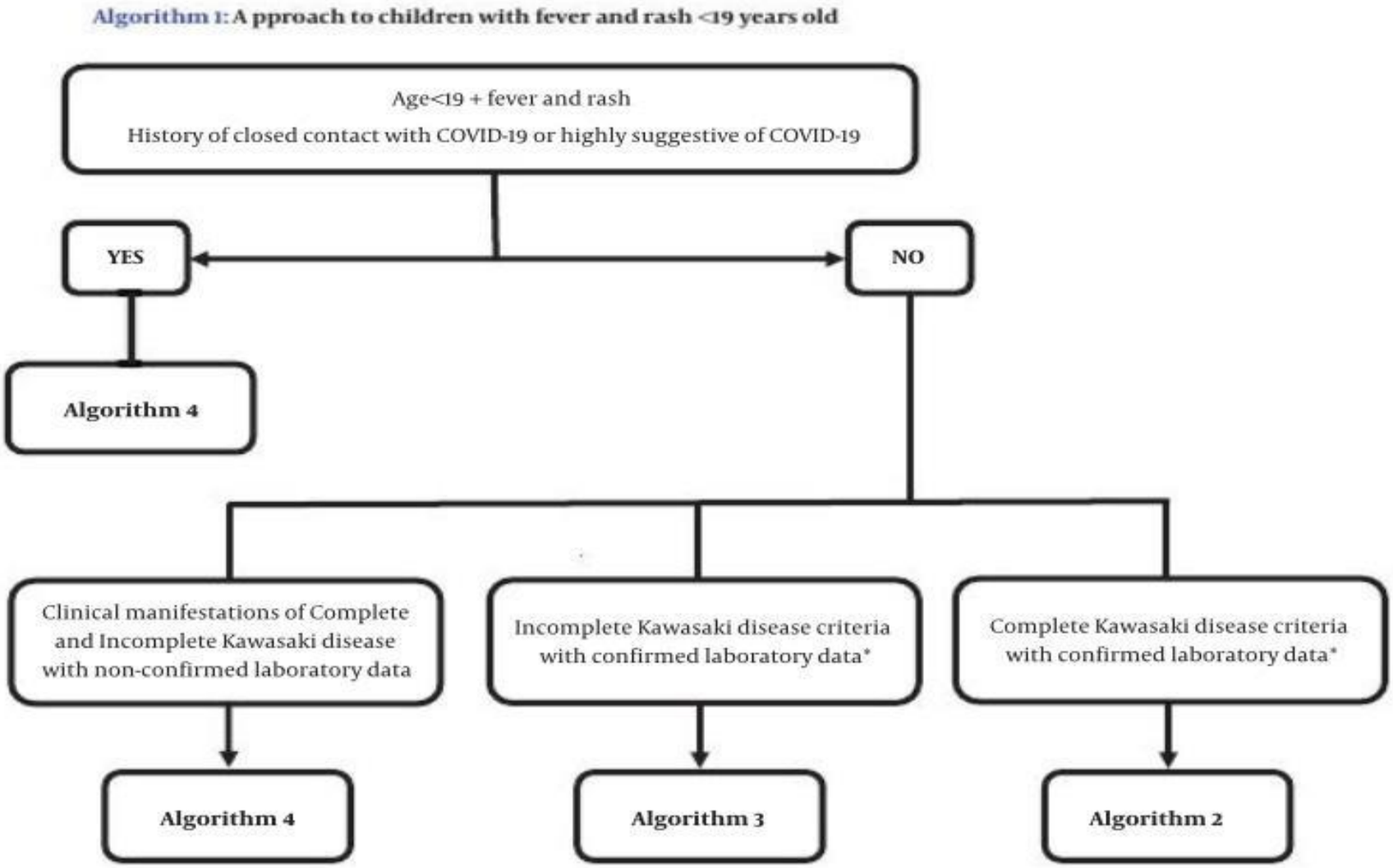
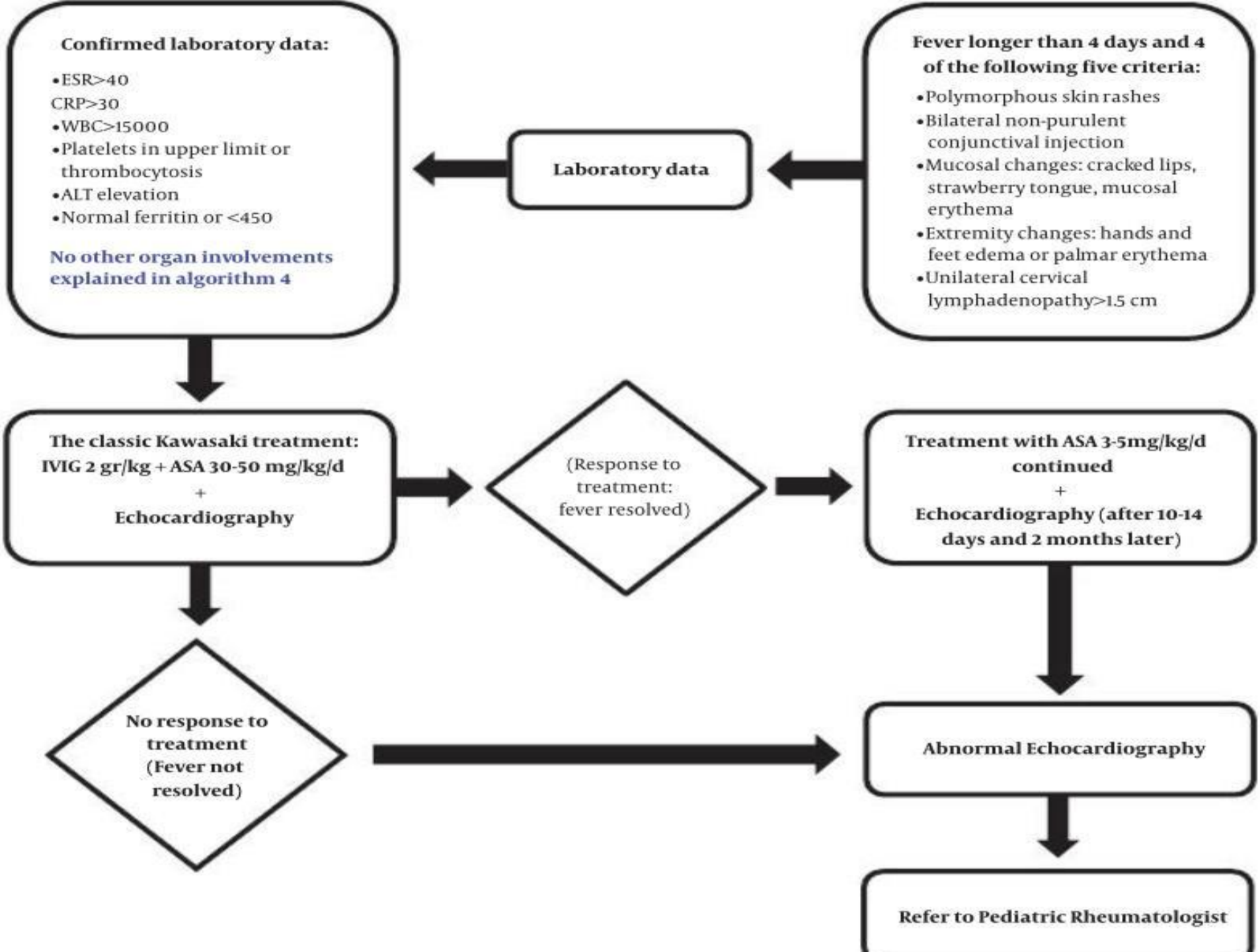
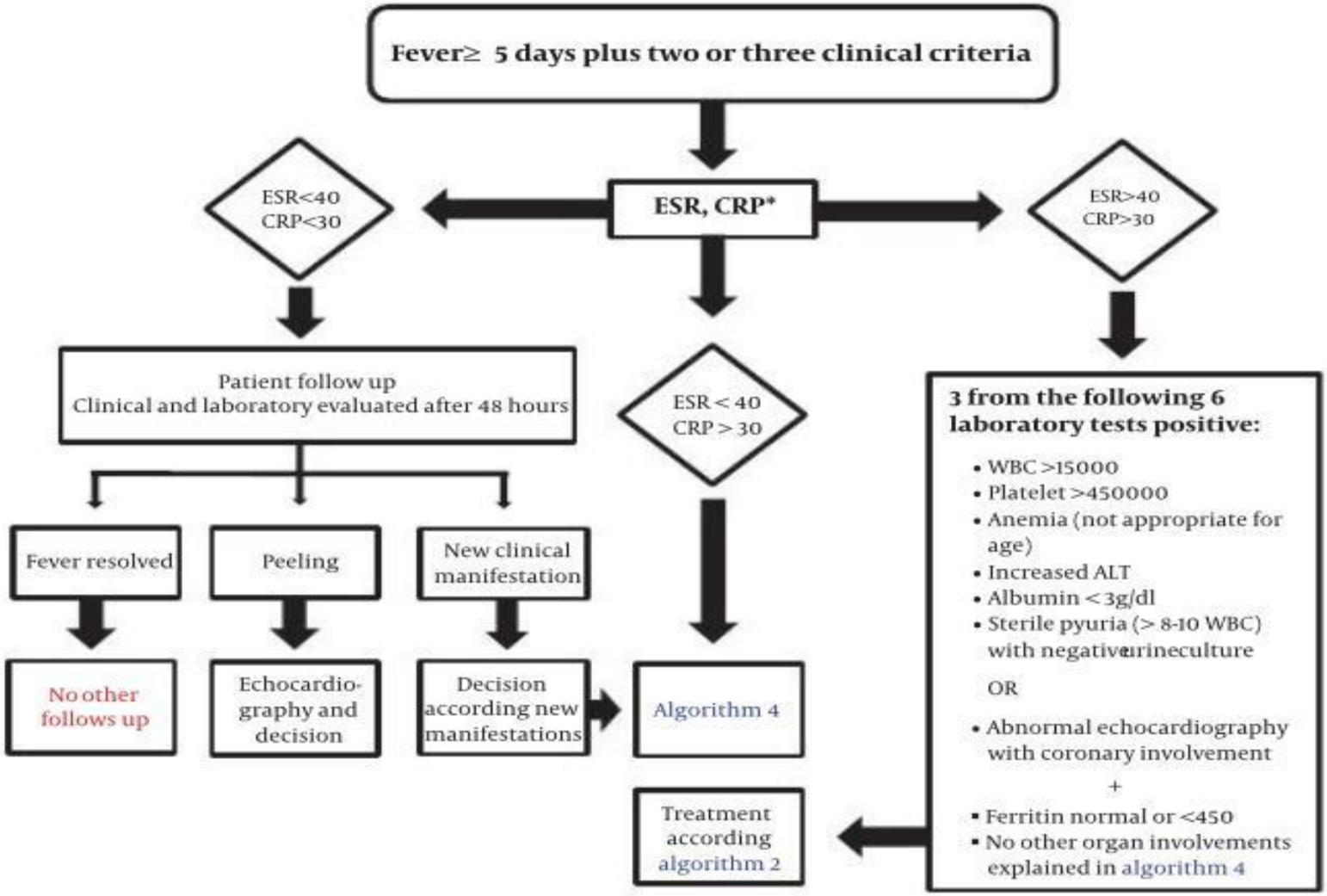


Figure 1. Approach to Kawasaki-like syndromes in pandemic COVID-19: The Tehran Children's Medical Center Protocol (algorithm 1); designed by Pediatric Rheumatology Department confirmed by Pediatric Infectious Diseases, Pediatric Intensive Care, Pediatric Cardiology, and Pediatric Emergency Departments.


Confirmed laboratory data:
•ESR>40
CRP>30
•WBC>15000
•Platelets in upper limit or thrombocytosis
•ALT elevation
•Normal ferritin or <450
No other organ involvements explained in algorithm 4
Laboratory data
Fever longer than 4 days and 4 of the following five criteria:
•Polymorphous skin rashes
•Bilateral non-purulent conjunctival injection
•Mucosal changes: cracked lips, strawberry tongue, mucosal erythema
•Extremity changes: hands and feet edema or palmar erythema
•Unilateral cervical lymphadenopathy>1.5 cm
The classic Kawasaki treatment:
IVIG 2 gr/kg + ASA 30-50 mg/kg/d
+
Echocardiography
(Response to treatment: fever resolved)
Treatment with ASA 3-5mg/kg/d continued
+
Echocardiography (after 10-14 days and 2 months later)
No response to treatment (Fever not resolved)
Abnormal Echocardiography
Refer to Pediatric Rheumatologist

Algorithm 3: Incomplete Kawasaki according to American Heart Association criteria



BOX 1: **Para-clinic evaluation for all suspicious patients:**

- CBC, ESR, CRP, B/C, U/A, U/C
- Liver function test, PT, PTT, INR, serum albumin and serum Ferritin
- D-Dimer, BNP, IL6, Procalcitonin (if available)
- Pancreatic and Cardiac Enzymes (in selective patients)
- Abdominal ultrasonography
- Echocardiography

caused by SARS-COV2

Complete or incomplete Kawasaki criteria
with≥ 1 unusual clinical criteria or laboratory results

and

Closed contact with COVID-19 or high suspicio us to COVID-19

Box 2

Unusual clinical manifestations in KD:

- **Shock or low blood pressure**
- **Cardiac failure, Carditis**
- **Acute abdominal presentations**
  - o Acute gastroenteritis
  - o Ascites or edema of intestinal wall
- **Hepatic failure**
- **Pancreas involvement**
- **Splenomegaly**
- **Clinical icterus**
- **Clinical manifestations of coagulopathy (thrombosis, bleeding, ..)**
- **CNS involvements (seizure, loss of consciousness, cranial nerve involvement)**

Box 3

Unusual laboratory results in KD:

- **Hematologic involvement:**
  - o Leukopenia (WBC <4000)
  - o Thrombocytopenia (platelets <150000)
  - o Lymphopenia (according to age)
- **Acute phase reactants:**
  - o ESR <30 with highly elevated CRP
  - o Ferritin >450 ng/ml
  - o IL-6 >100 pg/mL
  - o Procalcitonin >1 ng/mL
  - o BNP >100 pg/mL
- **Hypercoagulopathy state:**
  - o Increased PT, PTT
  - o Decreased fibrinogen <150
  - o D-Dimer >1000
- **Hepatic dysfunction:**
  - o Increased ALT >2 times

BOX 4

Imaging evaluations in CT scan and ultrasonography

- **Pulmonary involvements according to COVID-19**
- **Free fluid in abdominal cavity**
- **Edema of intestinal wall**
- **Thrombosis suspicions in imaging**
- **Ejection fraction** <45%

Box 5: Diagnostic criteria

- **Suspicious to KD according to clinical criteria** (algorithm 2, 3)

  Plus

- **Two of the 3 following criteria:**
  - o **At least One clinical criterion (box 2)**
  - o **At least two laboratory criteria (box 3)**
  - o **One imaging criteria (box 4)**

Algorithm 5: **Therapeutic approach to Kawasaki-like syndrome or multisystem inflammatory syndrome in children (MIS-C) by SARS-COV2**

Box 6: Treatment of cytokine storm*:

- Treatment with methylprednisolone pulses (20-30 mg/kg/day) for 3 consecutive days.
  +
- Treatment with IVIG 2gr/kg single dose after the first MTP (If coronary arteries involved)
  +
- Enaxaparin in critical patients (admitted in ICU) 0.5 mg/kg/dose every 12 hours
  +
- Aspirin 3-5 mg/kg

IVIg should be infused with blood pressure and pulse rate monitoring in a prolongated time of about 18-24 hours with complete hydration

* Consult pediatric rheumatologist

Box 7: Suspicious to infectious disease*

- Antibiotic therapy (if necessary)
- Anti viral therapy (if necessary)
- Hydroxychloroquine treatment
- Treatment of other symptoms

* The above mentioned approaches should be performed parallel cytokine storm treatment with pediatric infectious disease consultation

Fever not resolved

Consider biologic drugs based on expert pediatric rheumatologist consult

Fever resolved

Echocardiography (after 7, 14 days and 2 months)
and
Aspirin (3-5 mg/kg/day) until complete recovery with 3 normal echocardiography and normal platelet count (at least 2 months)

List of Abbreviations:
IVIg: Intravenous Immunoglobulin
ASA: Acetylsalicylic Acid
ESR: Erythrocyte Sedimentation Rate
CRP: C-Reactive Protein (mg/L)
KD: Kawasaki Disease
IL-6: Interleukine-6
BNP: Brain natriuretic peptide
CNS: Central Nervous System
PT: Prothrombin Time
PTT: Partial thromboplastin time
ALT: Alanine Aminotransferase

Figure 5. Approach to Kawasaki-like syndromes in pandemic COVID-19: The Tehran Children's Medical Center Protocol (algorithm 5); designed by Pediatric Rheumatology Department confirmed by Pediatric Infectious Diseases, Pediatric Intensive Care, Pediatric Cardiology, and Pediatric Emergency Departments.

بیمار با تب بالا و یا مساوی ۳۸ درجه برای بیش از ۴ روز با ۲ تا ۵ علامت بیماری کاوازاکی مراجعه می کند:

بثورات جلدی (پلی مورفیک و یا ماکولوپاپولار)
اریتم و ادم دست و پا
اریتم و ترک خوردگی لب ها زبان توت فرنگی و اریتم مخاط دهان و حلق
لنفادنوپاتی گردن یکطرفه با اندازه بیش از ۱/۵ سانتیمتر
کنژنکتویت دو طرفه غیر چرکی
CRP>=30 , ESR>=40و
در ضمن بیمار یافته غیر طبیعی به نفع بیماری دیگری غیر از KD نداشته باشد و تشخیص های افتراقی رد شده باشد.

در آن صورت:

- اکوکاردیوگرافی برای بیمار انجام شود.
- در صورت مطرح شدن کاوازاکی آتیپیک یا کلاسیک درمان استاندارد با IVIG و آسپیرین شروع شود.
- در صورت داشتن سابقه مبتلا بودن به کووید-۱۹ یا تماس با بیمار بهبود یافته طی دو هفته اخیر از نظر ابتلا به کووید -۱۹ بررسی شود و اقدامات درمانی و پیشگیرانه مطابق با دستورالعمل کشوری کووید در اطفال به عمل آید.

بیمار سیر بیماری کاوازاکی را طی و با اولین دز IVIG تب قطع می شود و طبق پروتکل درمان کاوازاکی پس از ۷۲-۴۸ ساعت بدون تب بودن، دز ضد التهاب آسپرین به ضد ترومبوز تبدیل شده و از نظر قلبی با ثبات است.

خیر

در صورت وجود یکی و یا بیشتر از علایم ناسازگار با کاوازاکی:

- شوک یا فشار خون پایین
- نارسایی قلبی و یا کاردیت
- شواهد دال بر شکم حاد، گاستررو انتریت حاد
- آسیت غیرر قابل توجیه
- هپاتیت با و یا بدون زردی
- اسپلنومگالی
- بثورات جلدی پاستولار، وزیکولار و یا پتشی و پورپورا
- شواهد بالینی به نفع کوآگولوپاتی
- شواهد به نفع انسفالیت (مثل کاهش سطح هوشیاری، تشنج و درگیری اعصاب کرانیال و ...)

تشخیص افتراقی‌های مثل، سپتی سمی ، TSS ناشی از استرپ گروه A و یا استافیلوکوک، KD-Shock syndrome، تب های هموراژیک (به خصوص CCHF) و سندرم التهابی چند سیستمی ناشی از کرونا ویروس (MIS-C) و MAS مد نظر باشد و آزمایشات مرتبط طبق کتب مرجع بعمل آید.

بله

ترخیص با توصیه های لازم شامل هشدار علایم خطر

اگرمعیارهای زیر وجود داشته باشد بیمار به عنوان MIS-C در نظر گرفته شود:

A.سن ۱۹-۰ سال

B.تظاهرات بالینی شامل تمام موارد زیر :

۱.تب ثابت شده بالای ۳۸ درجه برای بیش از ۲۴ ساعت

۲. درگیری دو ارگان یا بیشتر شامل : کاردیو واسکولار (مثل شوک، افزایش troponin، BNP، اکوی غیر طبیعی و آریتمی،F.E<٪۴۵) ؛ درگیری تنفسی (مثل پنومونی، ARDS، آمبولی ریه)، درگیری کلیه ها (مثل AKI و نارسایی کلیوی)؛ گرفتاری اعصاب (تشنج، منتژیت آسپتیک، کاهش سطح هوشیاری و Stroke)؛ هماتولوژیک مثل کواگولوپاتی؛ درگیری گوارشی (مثل افزایش آنزیم های کبدی، ایکتر،اسهال واستفراغ، ایلئوس، شکم حاد ، خونریزی گوارشی وعلایم ونشانه های مرتبط باپانکراتیت) و پوستی (مثل اریترودرمی، موکوزیت و سایر راش ها)

۳. بیماری شدید منجر به بستری

۴.شواهد آزمایشگاهی به نفع التهاب شامل موارد زیر:

- غیرطبیعی شدن مارکرهایی مثلCRP ,ESR ۳۰< وهمزمان افت غیرقابل توجیه ESR<۴۰، فیبرینوژن زیر ۱۵۰ ، PCT ، فریتین، LDH>۵۰۰ ،۱۰۰۰< IL6، نوتروفیلی ، لنفوپنی و هیپوآلبومینمی

C. رد سایر تشخیص های افتراقی مطرح شده در همین الگوریتم

D .شواهد بنفع عفونت SARS- CoV2 شامل هر کدام از موارد زیر:

وس کرونا

C0 ویا فرد درقرنطینه

SARS-Co۲ و یا تماس با مورد CoVID-19 و یا فرد در قرنطینه

بیمار با شرح حال تب بیش از ۳۸ درجه به همراه شوک یا اختلال عملکرد میوکارد و یا نیازمند وازو پروسور و یا نارسایی شدید یکی از ارگان های بدن در PICU و در غیر این صورت در بخش بستری شود. (مطابق دستورالعمل کشوری کودکان)

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- مانتیور علایم و نشانه های مرتبط صورت بگیرد و احتمال موضع عفونی رد شود.
- انجام اکوکاردیوگرافی و سونوگرافی (در صورت وجود علایم شکمی)، مانیتور با EKG و گازهای خون شریانی
- ایجاد ثبات همودینامیک منطبق با وضعیت بیمار (از نظر شوک، اختلال عملکرد قلبی و...)
- شروع آنتی بیوتیک مناسب بسته به وضعیت بیمار
- شروع IVIG در صورت وجود شواهد دال بر TSS؛ Kawasaki Shock Syndrome و MIS-C
- شروع پالس میتل پردنیزولون با دز 20-30 mg/kg/day برای سه روز متوالی
- شروع LMWH (آنوکساپارین) با دز پایین برای پیشگیری از ایجاد ترومبوز
- ارسال کشت از محیط های استریل مثل خون، مایع مغزی نخاعی و مایع آسیت و نیز گلو و زخم در صورت وجود .
- بررسی آزمایش های عملکرد کبدی، گازهای خون شریانی، تری گلیسیرید، فریتین، فیبرینوژن، تروپونین، آلبومین ، الکترولیت ها، کلسیم، منیزیوم،(مارکرهای التهابی حاد) APR ها و ..
- تصمیم جهت تکرار آزمایشات بر اساس شرایط بیمار وتاریخ آزمایشات
- ارسال PCR نازوفارنکس جهت ویروس کرونا و نیز سرولوژی
- نمره دهی بالینی و پاراکلینکی برای CCHF بر اساس پروتکل کشوری کریمه کنگو و درمان درصورت شک بالینی قوی
- با توجه به درگیری چند ارگان، تیمی متشکل از تخصص های مرتبط بیمار را اداره می‌کنند.

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پاسخ مناسب به درمان

بله ← پیگیری بر اساس ارگان درگیر و شرایط بیمار

خیر ← مشاوره باافراد با تجربه در این خصوص ودرمان با ایمیونومدولاتورها مثل Tocilizumab و Infliximab

نکته: