STANDARD TREATMENT WORKFLOW (STW)

KAWASAKI DISEASE

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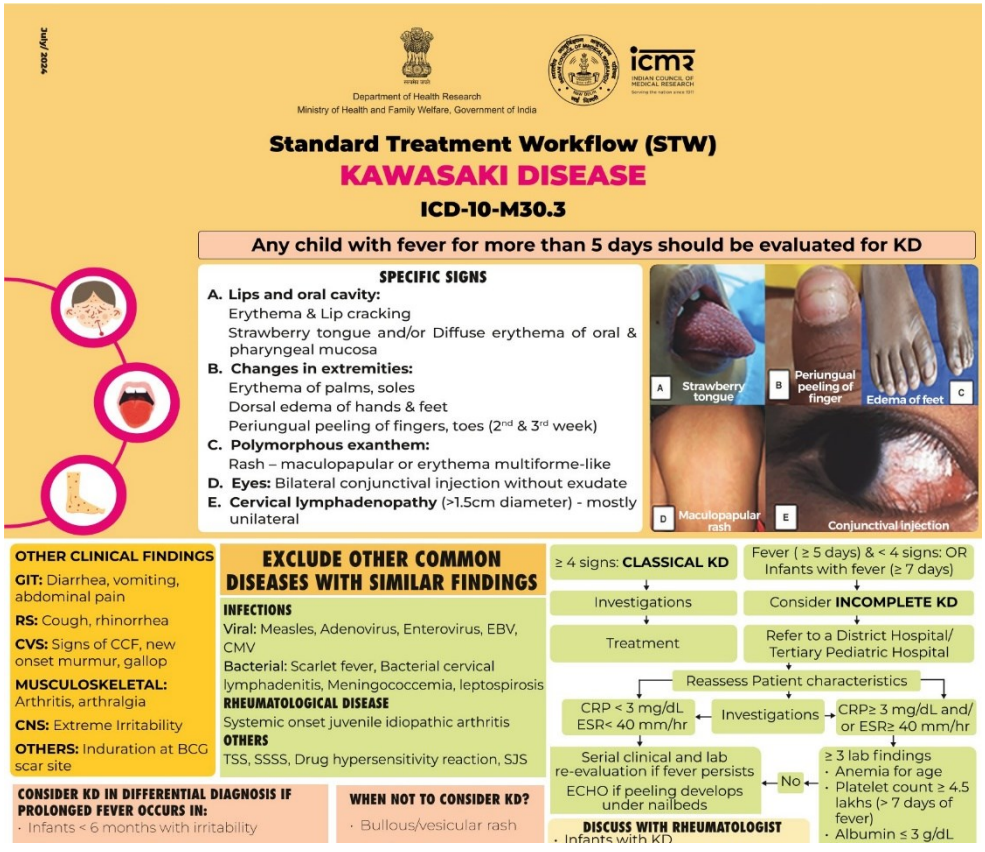

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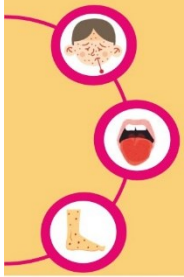
Standard Treatment Workflow (STW)

KAWASAKI DISEASE

ICD-10-M30.3

Any child with fever for more than 5 days should be evaluated for KD



SPECIFIC SIGNS

A. Lips and oral cavity:
Erythema & Lip cracking
Strawberry tongue and/or Diffuse erythema of oral & pharyngeal mucosa

B. Changes in extremities:
Erythema of palms, soles
Dorsal edema of hands & feet
Periungual peeling of fingers, toes (2nd & 3rd week)

C. Polymorphous exanthem:
Rash – maculopapular or erythema multiforme-like

D. Eyes: Bilateral conjunctival injection without exudate

E. Cervical lymphadenopathy (>1.5cm diameter) - mostly unilateral

OTHER CLINICAL FINDINGS

GIT: Diarrhea, vomiting, abdominal pain

RS: Cough, rhinorrhea

CVS: Signs of CCF, new onset murmur, gallop

MUSCULOSKELETAL: Arthritis, arthralgia

CNS: Extreme Irritability

OTHERS: Induration at BCG scar site

EXCLUDE OTHER COMMON DISEASES WITH SIMILAR FINDINGS

INFECTIONS
Viral: Measles, Adenovirus, Enterovirus, EBV, CMV
Bacterial: Scarlet fever, Bacterial cervical lymphadenitis, Meningococcemia, leptospirosis
RHEUMATOLOGICAL DISEASE
Systemic onset juvenile idiopathic arthritis
OTHERS
TSS, SSSS, Drug hypersensitivity reaction, SJS

≥ 4 signs: **CLASSICAL KD** → Investigations → Treatment

Fever (≥ 5 days) & < 4 signs: OR Infants with fever (≥ 7 days) → Consider **INCOMPLETE KD** → Refer to a District Hospital/ Tertiary Pediatric Hospital

Reassess Patient characteristics

CRP < 3 mg/dL ESR< 40 mm/hr ← Investigations → CRP≥ 3 mg/dL and/ or ESR≥ 40 mm/hr

Serial clinical and lab re-evaluation if fever persists
ECHO if peeling develops under nailbeds

← No

≥ 3 lab findings
- Anemia for age
- Platelet count ≥ 4.5 lakhs (> 7 days of fever)
- Albumin ≤ 3 g/dL
- Elevated SGPT
- WBC ≥ 15,000/mm³
- Urine > 10 WBC/hpf

or
- Positive Echocardiogram

Yes → **INCOMPLETE KD** → Treatment

DISCUSS WITH RHEUMATOLOGIST
- Infants with KD
- Children with coronary dilatation at time of diagnosis
- Children with shock and myocarditis
- Children who have features of secondary MAS

May need primary intensification of therapy in addition to IVIG (Infliximab, Steroids, Cyclosporine, etc.)

CONSIDER KD IN DIFFERENTIAL DIAGNOSIS IF PROLONGED FEVER OCCURS IN:
- Infants < 6 months with irritability
- Infants with unexplained aseptic meningitis
- Infants or children with unexplained or culture –negative shock
- Infants or children with cervical lymphadenitis unresponsive to antibiotics
- Infants or children with retropharyngeal phlegmon unresponsive to antibiotics

WHEN NOT TO CONSIDER KD?
- Bullous/vesicular rash
- Exudative conjunctivitis
- Exudative pharyngitis
- Ulcerative oral lesions
- Generalized lymphadenopathy
- Splenomegaly

MANAGEMENT

INVESTIGATIONS
- CBC
- CRP
- ESR
- Serum electrolytes
- LFT
- Urine microscopy
- Echocardio-gram

WHAT TO LOOK FOR?
- **CBC:** Leukocytosis –Neutrophilia, Anemia, Thrombocytosis (in 2nd week)
- **CRP-** ↑
- **ESR-** ↑
- **LFT:** SGOT, SGPT - ↑, Albumin↓
- **Serum electrolytes** – Sodium↓
- **Urine microscopy-** Sterile pyuria
- **ECHO-** Coronary artery dimensions, perivascular brightness, lack of tapering, LV dysfunction, mitral regurgitation, pericardial effusion

ECHOCARDIOGRAPHY - TO BE DONE BY A PAEDIATRIC CARDIOLOGIST

Positive ECHOCARDIOGRAM:
Any one of the below-
- RCA or LAD Z score: ≥ 2.5
- Coronary artery aneurysm
- ≥ 3 of the following: LV dysfunction, Mitral regurgitation, pericardial effusion, RCA or LAD Z score: 2 - 2.5

Z-SCORE CLASSIFICATION	
< 2	Normal
2-2.5	Only dilatation
≥ 2.5 to < 5	Small aneurysm
≥ 5 to < 10	Medium aneurysm
≥ 10	Giant aneurysm

2-D ECHO imaging:
Aim for highest resolution & frame rate possible
Phased array transducer with highest frequency possible
- Narrow sector width
- Adjust focus to region of interest
- Reduce depth
- Zooming in
- Optimize gain

TREATMENT

WHEN TO START IVIG?
- In children who meet diagnostic criteria as soon as possible (ideally within 10 days of fever onset)
- Even after 10 days of illness if evidence of systemic inflammation is present (elevated ESR/ CRP) with fever
- Recurrent KD (repeat episode after complete resolution of previous episode)

Unavailability of ECHO should not delay IVIG if diagnostic criteria are met

- Intravenous Immunoglobulin-IVIG (2g/kg) as a single infusion over 10-12 hours
- Aspirin 80-100 mg/kg/day in 4 divided doses –till child is afebrile or 48 to 72 hrs after cessation of fever

Aspirin: 3-5 mg/kg/day for 6 to 8 weeks

LONG TERM THROMBOPROPHYLAXIS FOR CORONARY ARTERY INVOLVEMENT

CORONARY ARTERY	DRUG	DURATION
No involvement	Aspirin* 3-5 mg/kg/day	6-8 weeks
Only dilatation	Aspirin* 3-5 mg/kg/day	6-8 weeks
Small aneurysm	Aspirin* 3-5 mg/kg/day	Till aneurysm resolves (Consult pediatric cardiologist)
Medium aneurysm	Aspirin* 3-5 mg/kg/day + Clopidogrel 0.2-1mg/kg/day	
Giant aneurysm	Aspirin* 3-5 mg/kg/day + Anticoagulation (Warfarin: 0.2 mg/kg/day loading, then 0.1mg/kg/day or LMWH 1mg/kg/day)	

*If patient is intolerant/resistant to Aspirin - use Clopidogrel

TREATMENT OPTIONS FOR IVIG RESISTANCE (PERSISTENT OR RECRUDESCENT FEVER 36 HOURS AFTER THERAPY WITH IVIG)

DRUGS	DOSE	DURATION
IVIG (second infusion)	2g/kg IV	Single dose
Pulse methyl prednisolone followed by Oral prednisolone in tapering doses	Intravenously (10-30 mg/kg/day) 2mg/kg	3-5 days Till CRP is normal, then taper over 2-3 weeks
Infliximab	5mg/kg IV over 3-4 hours	Single dose

ABBREVIATIONS

CBC: Complete Blood Count
CMV: Cytomegalovirus
CRP: C-reactive Protein
EBV: Epstein-Barr Virus
ESR: Erythrocyte Sedimentation Rate
KD: Kawasaki Disease
LAD: Left anterior Descending Artery
LFT: Liver Function Test
LMWH: Low Molecular Weight Heparin
LV: Left Ventricle
MAS: Macrophage Activation Syndrome
RCA: Right coronary Artery
SGOT: Serum Glutamic Oxaloacetic Transaminase
SGPT: Serum Glutamic-Pyruvic Transaminase
SJS: Stevens-Johnson Syndrome
SSSS: Staphylococcal Scalded Skin Syndrome
TSS: Toxic Shock Syndrome
WBC: White Blood Cell

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DELAY IN DIAGNOSING KAWASAKI DISEASE CAN RESULT IN ADVERSE CLINICAL OUTCOMES