Fever

Causes

- Infection (Viral - **Dengue/**Bacterial-**Lepto**/ Fungal/ Protozoal
- Inflammatory
- Malignancy
- Allergic reaction
- Drug reaction
- Blood transfusion
- Graft-versus-host disease
- Thrombosis

Detailed history- Key elements

- Onset, duration & pattern of fever
- Associated symptoms
- Muddy Exposure
- Fever Contact
- Chronic symptoms
- Travel history
- Sexual history
- IV drug use
- Animal contact
- Medication history
- Vaccination history

Examination -Key elements

- Vitals (SpO2, RR, PR, BP, Temp)
- Lymphadenopathy
- Jaundice
- Skin – evidence of rash or cellulitis
- Musculoskeletal – evidence of arthroplasty, spinal, sternal tenderness
- Genitalia – ulcers, vesicles, discharges
- Mouth & oropharynx
- Eyes
- Abdomen – hepatomegaly, splenomegaly/ RAT
- CVS – new diastolic murmur, change in an existing murmur
- CNS-Neck Stiff ness

Investigations for FUO

- Blood tests – FBC, U&E, LFT, clotting, ESR, CRP
- Blood cultures
- Sputum microscopy & culture
- CXR
- ECG
- Urine dipstick, microscopy & culture
- Stool culture

Other investigations depend on the clinical picture

Management

- General
  - Antipyretics
  - Empirical antibiotics ~~if~~ an infective source is suspected, commenced after samples & cultures obtained
  - Increase fluid intake/Input - output chart
  - Remove excess clothing & bed linen
  - Bath or sponge with tepid water

- Specific management
  (determined by the underlying cause)

Indications for admission

1. Dengure fever with clinically/ ultrasonically confirmed leaking.
2. Fever with shock/sepsis.
3. Suspected Dengue fever with:

Essential criteria for admission

1. Patients platelet count less than 130 000/mm^3
2. If the Platelet Count is between 150 000 – 130 000/mm^3 , the Medical Officer should make a decision depending on the clinical judgment.

   If the platelet count tested more than 4 hours ago is more than 130 000/ mm3 the patient should be observed in the fever room and a repeat count should be done. If the repeat count is lower, decide on admission.
3. Fever for 3 or more days, and already not performed a Full Blood Count, patient should be observed in the fever room until the Full Blood Count report is available.
4. Rapid drop in Platelet Count over a short period of time (in 2 consecutive FBC reports) platelet count coming close to 150 000/mm^3 .
5. Patient is clinically unwell especially when fever is settling with deteriorating symptoms as follows (Warning Signs) to be applied on or after 3rd day of illness
   - Weakness
   - Lethargy / restlessness
   - Severe headache
   - Persistent severe vomiting
   - Severe abdominal pain
6. Patient insisting on admission – get a senior opinion if necessary
7. Special conditions
   - Pregnant mothers (Preferably admit on day 01)
   - Children less than one and half years old (Other patients who may need admission even without the above criteria:
   - Elderly patients
   - Obese patients
   - Patients with co-morbid conditions like diabetes, chronic renal failure, ischaemic heart disease, thalassaemia and other haemoglobinopathies and other major medical problems
   - Patients with adverse social circumstances- e.g. living alone, living far from health facility without reliable means of transport.

4. Leptospirosis

❖ Suspected case of leptospirosis with organ involvement and/or significant co morbidities.

HISTORY OF EXPOSURE FOR LEPTOSPIROSIS

- High risk occupations such as paddy farming, construction work, gem mining, sand mining, working in “keerakotu/kohilakotu”

- Recreational activities in paddy fields/muddy grounds, white water rafting
- Contact with potentially contaminated water such as cleaning drains/wells, bathing and washing in small water streams ,rivers and lakes, flood water
- Contact with animals or animal tissues such as cattle, buffalo - animal handlers, veterinarians, butchers, rodent control workers, abattoir workers.

Contact with water contaminated with urine from an animal known to be a reservoir species is the most important risk condition in transmission Known reservoir species include rats and other rodents, buffalo, cattle, dogs and pigs. The presence of breached skin increases the risk of infection

EVEIDENCE OF ORGAN INVOLVEMENT IN LEPTOSPIROSIS

EVIDENCE OF HEPATIC INVOLVEMENT

The presence of one or more of the following

- Jaundice
- Tender hepatomegaly
- Aspartate Transaminase (AST) or Alanine Transaminase (ALT) increased more than thrice the upper limit of normal
- Raised serum bilirubin, serum alkaline phosphatase or serum gamma-GT

EVIDENCE OF RENAL INVOLVEMENT

The presence of one or more of the following

- Suggestive symptoms, such as reduced urine output, haematuria
- Acute kidney injury (AKI) (Acute Kidney Injury Network (AKIN) stage 1 or above) Rise in serum creatinine ≥ 0.3 mg/dl (≥26.5 µmol/l) above baseline within 48 hours Serum
- creatinine > 1.5 times the baseline within 48 hours Urine output < 0.5ml/kg/hour for 6 hours
- Haematuria, granular casts, red cell casts in the urinary sediment

EVIDENCE OF PULMONARY INVOLVEMENT

The presence of one or more of the following

- Oxygen saturation 30/min (> 60/min in infants, >40/min in 1 – 12 years)
- Crackles and wheezes on auscultation of the lungs
- Lung parenchymal involvement on chest radiograph EVIDENCE OF CARDIAC INVOLVEMET The presence of one or more of the following
- Suggestive symptoms and signs, such as shortness of breath, chest pain, palpitations, crackles
- Hypotension
- Electrocardiogram (ECG) abnormalities such as arrhythmias, ST segment/ T wave changes , bundle branch block

- Wall motion abnormalities on echocardiography EVIDENCE OF HAEMATOLOGICAL INVOLVEMENT The presence of one or more of the following
- Bleeding manifestations
- Platelet count less than 130 x 109 /L
- Disseminated intravascular coagulopathy (DIC)

5. Clear focus of fever meeting sepsis criteria or needing admission for source control.
   Eg: pneumonia with CURB 65 score 2 or more
   Suspected meningitis

Discharge criteria

1.A suspected case of leptospirosis with NO organ involvement and/or significant co-morbidities COULD BE managed on an outpatient basis

Antibiotic therapy :Doxycycline 100mg 12 hourly for 7 days

Investigations
- Full Blood Count (FBC)
- Erythrocyte Sedimentation Rate (ESR)/C-Reactive Protein (CRP)
- Serum creatinine /urea, serum electrolytes
- AST/ALT
- Urine Full Report (UFR)

Monitoring
- Monitor urine output at home (provide a mechanism to measure urine output, such as a marked empty saline bottle)
- Review after 48 hours
- Present to Outdoor Patient Department (OPD) earlier if there is
  - appearance of jaundice
  -reduction in urine output <300ml in 12 hours
  -cough or breathing difficulty

- If no admission is needed at 48 hour review, re-assess in another 48 hours.

Decide on subsequent visits based on clinical features and the presence of fever

❖ Undifferentiated fever <3 days without suspicion of leptospirosis and haemodynamically. Review daily with Full Blood Count (FBC).

First FBC should be done at least on the third day of fever/illness and daily thereafter if the platelet count is >150,000/ mm3. FBC should be done twice daily if the platelet count is >100,000/ mm3.

- Ensure adequate oral fluid intake of around 2500 ml for 24 hours (if the body weight is less than 50kg give fluids as 50ml/kg for 24hours). This should consist of oral rehydration fluid, king coconut water, other fruit juices, kanji or soup rather than plain water. Exclude red and brown drinks which could cause confusion with

haematemesis or coffee ground vomitus.

- Adequate physical rest
- Tepid sponging for fever
- Paracetamol not exceeding 2 tablets six hourly (reduce dose for patients with lower body weights). Warn the patient that the fever may not fully settle with paracetamol and advice not to take excess.
- Anti-emetics and H2 receptor blockers if necessary
- Avoid all NSAIDS and steroids

Advise immediate return for review if any of the following occur:

-Clinical deterioration with settling of fever
-Inability to tolerate oral fluids
-Severe abdominal pain
-Cold and clammy extremities
-Lethargy or irritability/restlessness
-Bleeding tendency including inter-menstrual bleeding or menorrhagia
-Not passing urine for more than 6 hours

2. Dengue fever

Criteria for ambulatory care

Patients with a platelet count more than 130 000 / mm3 (tested within 2 hours) and clinically stable.

Advices during ambulatory care

1. Suitably document clinical signs and symptoms together with the Full Blood Count report.
2. When and how often should the Full Blood Count to be repeated?
    - Platelet Count 150 000 – 200 000 / mm3– repeat the count 2 to 3 times per day (If the Platelet drop in subsequent count is slow- repeat the count 2 times per day and if it is rapid, 3 times per day)
    - Platelet Count less than 150 000 / mm3 – repeat the count 3 times per day
3. What to eat and drink?
    - If appetite is good take a light and nutritious diet more frequently
    - The fluids should include not only water, but certain electrolyte solutions such as fruit juice, white rice kanji, Oral Rehydration Solution (ORS), king coconut juice. These solutions are better than taking only water.
    - Do not consume red or brown color foods or beverages to avoid confusion in blood stained vomiting
    - Unless medically advised, other dietary restrictions are not generally recommended

4. How to maintain the urine output?
    - Consume recommended amount of fluids to maintain the usual normal urine output. Amount needed for a child in one hour is approximately double the ideal body weight in milliliters with the maximum limit of 100 ml. The fluid amount for an average adult is 2 to 2.5 liters per day (unless there is vomiting/diarrhoea).
    - If the patient is feeling thirsty taking additional fluid up to 4 times/day is allowed but if needing more should seek medical advice again.
    - Patient should measure the urine output every 4 hourly. Ensure they pass at least about 1ml/ kg / hour urine(which equals approximate ideal body weight). If the urine output is less than this, patient should consume more fluids to maintain the above urine output.
    - N.B. – Diabetics with poor glycemic control may pass more urine even without adequate hydration. These patients need special attention.

5. How to control fever?
    - Fever should be controlled in children with Paracetamol (Dose 15- 20 / kg body weight) only. 15mg / kg dose – four times per day or 20 mg / kg dose – three times per day.
    - In adults Paracetamol should be given not exceeding 2 tablets 6 hourly (reduce dose for patients with lower body weight).
    - Paracetamol dose should not exceed 60 mg/ kg /day. • The gap between 2 doses of Paracetamol should be at least 4 - 6 hours
    - If fever is not adequately subsiding in between Paracetamol doses, using a fan and sponging with moderately warm water is recommended. Patient should be with minimal clothes under a bed net.
    - Make sure under no circumstances should NSAIDs be used to bring down the fever even for patients who are on these medications for chronic conditions.

6. Care at home
    - Physical rest is highly recommended. Patients should be preferably at home, resting.
    - Make sure patients are not left alone at home. There has to be somebody to look after them.

7. Symptoms like repeated vomiting, diarrhoea can lead to dehydration. Such patients should seek immediate treatment without waiting for the next Full Blood Count

8. Patients should avoid other medications especially Steroids during the fever episode. Patients who are on special medications like Warfarin, Aspirin and Clopidogrel should seek medical advice whether to continue these drugs as they are not recommended during Dengue fever.