Approach to a child with fever at the Kanti Children's Hospital OPD in children of more than 2 months

It is the Commonest symptom for which parents bring their children to Kanti Children's Hospital. It should be carefully reviewed because often there are no localizing signs, managed with different modalities of treatment and often present late with modified pathology. It is necessary to have good clinical approach to reach the cause of fever and avoid unnecessary use of antibiotics or diagnostic tools. It is essential to differentiate fever under two heading: fever for less than three days and fever for more than three days for the OPD management.

Fever of less than three days

Causes - Common causes of fever in different age groups are as follows:

2 months to 1 yr

Respiratory infection – nasopharyngitis, pneumonia, tonsillitis, otitis media

Viral fevers - influenza, measles, hepatitis, chicken-pox, mumps, herpangina
GI infection- dysentery, diarrhea

Occult sepsis
Skin infection -abscess, pyodermas
Urinary Tract Infection

Malaria, Kalazar

Dehydration fever.

1yr to 5 yr –

Respiratory infection

GI infection - Typhoid, diarrhea

Viral fevers: viral hepatitis, enteroviral, chicken pox, measles, mumps
Infective endocarditis
Abscess

Malaria. Kalazar

UTI

Which patients needs admission?

Approach to Fever - In a brief history, it is essential to ask for (do not ask those questions for which you cans see e.g. ear discharge, rash etc)

1. Duration of fever
   Family members or at hostel having similar illness
   Associated symptoms: vomiting, diarrhea, cough, convulsion, urinary problem.
   Treatment given
2. Travel to other places
3. History of immunization

Quick Examination: (It is mandatory to examine a child with minimum clothes)

A. The following signs must be carefully looked for:

1.Look of the child - sick looking, toxic, playful
2.Resp. rate, cyanosis, icterus, lymphadenopathy, petechiae, purpuric spots, dehydration, sweating, red weeping eyes, blisters, generalized or local tenderness , salivation, swellings, wounds. Swollen, tender joints.

3. Throat and ear: tonsils, ulcer over palate and gum, ear discharge and drum

4. Abdomen: hepatomegaly, splenomegaly, tenderness (right hypochondria appendicitis)

5. Meningism or bulging fontanalle, neck stiffness

6. Chest: murmurs, ronchi, creps, reduced air entry.

Children with suspected meningitis (include first convulsion with fever even the child does not have meningeal signs) moderate to severe dehydration, subcostal indrawing, suspected of occult sepsis, bacterial endocarditis, purpura, large abscess, severe pallor, severe malnutrition, GI bleeding, respiratory distress, on oral antibiotic for 5 days and the child looks toxic with high fever.

Which patients could be discharged from OPD?

Most of the patients who does not have the severe signs could be followed up from OPD. Children with fever on their first visit may not have localizing signs within three days of onset of fever. Fever is not an indication to write antibiotics. Antibiotic can only be prescribed if site of infection is known. These children are prescribed with antipyretics and discharged with good counseling.

What to do in the next follow-up?

Look for the localizing signs. If signs are present treatment and investigations are done accordingly. If no localizing signs are seen following investigations are asked for:

It is common practice to ask for a battery of investigations, which should be avoided unless -

- fever is for prolonged time and not responding to routine treatment

- chronic fevers which relapse frequently

Common investigations to be asked for are

1. Total and Differential WBC count , ESR.

2. Blood culture, Urine culture UTI is strongly suspected (pus cells are moderate to high/HPF).

3. X-ray chest - if signs of pneumonia, empyema, pleural effusion or primary complex, or no localizing signs

4. Liver function tests

5. Mantaux tests.

Clinical approach to a child with fever

A good clinical history and a thorough physical examination should form the basis of making a provisional diagnosis. *Laboratory tests should only be supportive and not an alternative to clinical diagnosis.*

A. History

1. Age: Fever in infants < 2 months of age should be considered as evidence of serious bacterial infection until proven otherwise.

2. Duration of fever : Fever lasting for more than 4-7 days is rarely due to self limiting viral illness and needs investigation. Fever lasting for more than 2 weeks indicates serious underlying problem and needs thorough investigation.

3. Chills and rigors: both are non specific and suggest no definite etiology. Similarly sweating and night sweats are non specific in children.

4. Pattern of fever : The wide use of the antipyretics modifies the natural pattern of fever. It is not necessary to find out the type of temperature (continuous, remittent or intermittent) in the OPD setting. Nausea may indicate hepatic disease. Persistence of headache and vomiting may indicate meningitis.

5. ***Progress of fever***: Fever due to viral infection peaks over a day or two and gradually declines in 3-4 days. Bacterial fever worsens if left untreated. Malarial fever develops suddenly and declines swiftly.

6. Accompanying symptoms: specific symptoms help in localising the site of infection such as cough/cold in respiratory illness, diarrhea/vomiting in GI infection, dysuria in UTI, drowsiness or convulsions in meningitis. Non specific symptoms include bodyache, headache, anorexia, vomiting and irritability. Many children react with fever by these symptoms. These usually

disappear with the reduction of fever. Persistence of anorexia, headache and vomiting is seen in infective hepatitis, tubercular meningitis or UTI.

7. Contact with similar diseases: Knowledge of the epidemiology of a prevailing illness helps in suspecting the illness.

8. Past history of similar illness: Recurrent viral infections are common in children especially in the first year of school. Children between 2 months to 5 years of age are also susceptible to recurrent viral infections. Malaria may often recur, as the therapy is merely suppressive.

9. Drugs used in the treatment and its response

The *inter febrile* state helps in the evaluation of the probable cause of fever. Patterns of fever have limited value in predicting the etiology of fever. Therapeutic response to an antibiotic is very difficulty to assess accurately. Natural remission of a viral fever may be interpreted as response to an antibiotic. Typically, fever due to bacterial infection responds to antibiotic in 2-3 days. Typhoid fever takes longer duration to normalize.

10. Immunization: Vaccine preventable diseases are rare in immunized children. Clinical manifestations of the disease are often modified in immunized children.

B. Physical examination:

1. Assess seriousness:

Presence of the following signs suggests the possibility of serious underlying diseases:

a) Respiratory distress

b) Drowsiness / meningeal signs

c) Signs of impending shock

d) Purpuric spots

e) Severe pallor

f) Abdominal guarding / rigidity

2. General examination:

i) General appearance: Toxic/ill look indicates serious illness. Irritability or discomfort may either be due to pain or respiratory distress. A comfortable child indicates that a benign illness is likely.

ii) Body temperature: Must be quickly judged by merely touching the skin over the central and peripheral parts of the body. Differential body temperature: warm chest/abdomen and cool periphery-indicates severe illness.

iii) Pulse rate: With every degree Fahrenheit rise in the fever, pulse rate goes up by 10 beats/min. Disproportionate increase in the pulse rate may suggest early sepsis or primary cardiac disease.

iv) Respiratory rate : Normal ratio of pulse and respiration in health is 4:1. The ratio is increased in primary cardiac disease and decreased in respiratory pathology.

v) Skin rash

vi) Lymphadenopathy

vii) ENT examination (often forgotten)

3. Systemic examination

i. Respiratory system

ii. Central nervous system

iii. Cardiovascular system

iv. Abdomen

- Good clinical history and thorough physical examination form the first step in the management of fever in children.

- Inter febrile clinical state without antibiotic is the best predictor of fever etiology.
- Beware of warning signs that may suggest serious underlying illness in a febrile child.

C. Clinical approach to fever in relation to the duration of the fever:

See Algorithm I-A : Fever of 1-3 days

I.Therapeutic trial in undiagnosed fever:

In case of failure to diagnose inspite of rational approach, the following may be considered:

- Trial with chloroquine (considering epidemiology)
- Trials with antibiotics, choice based on the presumptive diagnosis. Trial with broad spectrum antibiotics should not be considered without relevant investigations to rule out serious infections such as UTI, Meningitis, Typhoid or Pneumonia.
- If the response to the first antibiotic is poor, another drug may be tried.
- If two drugs have failed, it is logical to reconsider the diagnosis rather than change the antibiotic.
- Do not try empirical treatment for tuberculosis except in life-threatening situations, wherein treatment must be completed for full conventional period, unless another cause for fever is found out during the trial period.
- Steroids should never be used for undiagnosed fever.

II. Empirical choice of antibiotic in fever:

- Do not prescribe an antibiotic without presumptive diagnosis.
- Routine investigations must be carried out to support the diagnosis.
- As clinical diagnosis of Bacterial infection in OPD is rarely possible within the first 2-3 days of fever, (except in case of Tonsillitis or otitis) prescribing antibiotic is not recommended during this period.
- If antibiotic is justified then, for most community infections, oral amoxycillin, or cotrimoxazole is sufficient (first line drugs).
- Injectable antibiotics are almost never needed in OPD practice.
- Newer antibiotics are not recommended for routine community acquired infections.

III. Change of specific antibiotic in fever:

- In confirmed diagnosis, change of therapy is rarely necessary.
- Improvement is anticipated over varying period of time in different drug sensitive, uncomplicated infections.

E.g. in malaria fever is under control in 2 days In respiratory infections 3-4 days In tuberculosis fever may continue for 1-2 weeks. In typhoid the fever begins to decline by 4th day of antibiotic therapy. The culture sensitivity reports for salmonella typhi from Kanti Children's Hospital Laboratory shows nearly more than 80% are sensitive to co-trimoxazole.

- In case of therapeutic failure check drug dosage, compliance, presence of any complications and the correctness of the diagnosis.
- In case the diagnosis is reasonably confirmed again, appropriate change of antibiotic is necessary based on the knowledge of prevalence of drug resistance pattern, unless specific bacteriological diagnosis and drug sensitivity pattern is available for choice of an antibiotic.
- Therapeutic failure even after the second trial of antibiotic demands reconsideration of diagnosis.

IV. Clinical approach to partially treated fever:

In such conditions the clinical picture might have been modified by prior therapy. If etiologic evidence is based on reasonable

evidence, dosage & compliance of drug is checked. In case of suspected drug resistance, change of therapy is justified. If the disease has never been diagnosed and the therapy is empirical, failure of response may be due to wrong diagnosis. It is best to continue empirical therapy while investigations are repeated to arrive at the right diagnosis.

V. Interpretation of laboratory tests in partially treated fever:

- Lab tests need to be repeated in patients who continue to be febrile even after few days of therapy
- Some tests may be modified by therapy. E.g. WBC counts, peripheral smear for malarial parasites, urinalysis and bacterial culture.
- Persistence of high ESR inspite of treatment suggests uncontrolled active disease. So is persistent eosinopenia, hence change in therapy may be indicated.
- Change from neutrophilic response to lymphocytic response in peripheral smear indicates recovering bacterial infection, hence to continue the same antibiotic.
- Improving laboratory tests with no clinical response should alert the physician to the possibility of complications.
- Clinical improvement with persistent abnormal tests warrants close observation without change in the antibiotic.

Algorithm for fever (less than three days)