CIS CME
Clinics India School of Continuing Medical Education

Quick Case Work-up

YESHWANT K. AMDEKAR, MD
Medical Director, BJ Wadia Hospital for Children
Consultant Pediatrician, Jaslok Hospital and Research Center and
Breach Candy Hospital, Mumbai, India

Dr Amdekar is a practicing pediatrician for 40 years. He has been a teaching faculty at the Institute of Child Health, Grant Medical College and JJ Group of Hospitals, Mumbai. He has also been the past President of Indian Academy of Pediatrics (IAP) and a member of editorial committee of Indian Pediatrics–the official journal of IAP

Delayed localisation of acute bacterial infection

History

A 2-year-old male (Weight: 11 kg; Length: 85 cm) presented with high fever of 6 days duration. Fever was intermittent, relieved by paracetamol but recurred every 4-6 hours. The child has been irritable for the last 4 days and has had diarrhea for the past 2 days. On day 6 of fever, the child's mother noticed a skin rash. There is no history of vomiting, cold or cough. Past history and family history were non-contributory. The patient was treated with paracetamol. No antibiotic was administered.

On physical examination, the patient looked sick and was irritable. The child's temperature was 102 degrees°F, pulse was 154/min, and the respiratory rate was 28 per min. CNS examination revealed mild neck stiffness; however, there were no other localizing signs. Examination of the neck revealed a single enlarged cervical lymph node on the right side that was not tender. In addition, examination of the eyes revealed non-purulent conjunctivitis. Abdominal examination revealed mild gaseous distension. The liver and spleen were of normal size. There was no respiratory distress or signs of dehydration. Other systems were normal.

Physical examination at a glance

Weight	: 11 kg	**Looks**	: sick and irritable
Height	: 85 cm	**Size**	: liver and spleen
Temp	: 102°F	**Skin**	: No rash
PR	: 154/min	**Ears and Nose**	: Normal
RR	: 28/min	**Other systems**	: Normal

What is the best management approach?

Select one or more.

1. Antibiotic – if so, which one?
2. Antipyretic – if so, which one?
3. CBC – which day would you do this?
3. CBC – which day would you do this?
4. Other tests

CASE DISCUSSION

It is optimal to analyze the patient's history to arrive at a provisional diagnosis. It is essential to conduct a focused physical examination and order specific laboratory tests to confirm the initial diagnosis.

HISTORY ANALYSIS

Fever at the onset of illness invariably denotes an acute infection. Although many non-infective disorders such as systemic inflammatory disease and malignancy may also begin with fever, they are rare and the correct diagnosis in such diseases usually evolves over time. High fever at the onset of an illness often represents a disease developing at the site of entry of organisms such as an acute viral infection or acute bacterial infection. Examples include acute tonsillitis, bacillary dysentery or a urinary tract infection.

An acute viral infection generally presents with cold, cough or vomiting, diarrhea or bodyache and headache. This child developed a high fever at the onset of illness and exhibited no other symptoms in the first 3 days of illness. Fever in most viral infections improves by days 3-4 and often there is a family history of a similar disease. Thus, it is unlikely to be a viral infection. However, since the disease was not localized to any site, it may be a bacterial infection. Thus, on day 3 of fever, one must closely observe the patient to find any localization. It could localize to any system such as the respiratory system (pneumonia) or central nervous system (meningitis). This is especially true if the child is already receiving antibiotics that could alter the presentation of the disease. However, occasionally, a low-grade bacterial infection may not localize early in the course of the disease.

On day 4, this child complained of throat pain. So the disease is localized to the throat, although the child may not have had any significant localizing symptoms until then. Perhaps a physical examination may have revealed a few localizing signs even before the onset of throat pain because symptoms depend upon the degree of severity and tolerance of the child. Thus, it is important to repeat a thorough physical examination periodically.

Conclusion. The patient is suffering from an acute bacterial throat infection, most likely acute bacterial pharyngo-tonsilitis.

PHYSICAL EXAMINATION ANALYSIS

The child looks sick and presents with a high fever on day 4 of illness. This favors the diagnosis of an acute bacterial infection. A congested throat with inflamed tonsils and tender and enlarged submandibular lymph nodes suggests acute bacterial pharyngo-tonsilitis. Nevertheless, it is important to carefully observe the patient for additional physical signs that may superficially mimic other conditions such as diphtheria, infectious mononucleosis or agranulocytosis. All of these diseases present with

Continued...

a membrane over the tonsils without the presence of pus and the tonsils are not inflamed. Children with diphtheria and agranulocytosis look very ill disproportionate to fever, while those with infectious mononucleosis do not look sick and often have hepatosplenomegaly and enlarged but non-tender lymph nodes. Thus, it should be routine to undertake a thorough physical examination to rule out the presence of other diseases.

MANAGEMENT ANALYSIS

OPTION 1

An antibiotic is necessary. This child must be treated with an antibiotic. A common organism causing acute tonsillitis is a gram-positive bacterium such as streptococci. Amoxycillin or first generation cephalexin would be optimal for such an infection. Treatment must be continued for 7 days. A stronger antibiotic is not necessary.

OPTION 2

Treatment with an antipyretic is necessary. Any child with fever should be given an antipyretic to ease the discomfort associated with fever. An antipyretic is not intended to reduce fever to normal. Paracetamol is the ideal antipyretic and ibuprofen and mefinimic acid are acceptable alternatives.

OPTION 3

CBC is not necessary. Diagnosis of an acute bacterial infection is reasonably clear in this child and so a CBC is not necessary. However, a CBC could have been considered on day 2 or 3, prior to the development of throat signs, as it may have indicated an oncoming bacterial infection. Nevertheless, it still would not have localized to any organ. It high neutrophilic leucocytosis was seen on day 2 or 3 one could have considered urinalysis or chest x-ray to look for localization. CBC may suggest other etiologies such as agranulocytosis or infectious mononucleosis.

OPTION 4

Throat swab. A throat swab can confirm the diagnosis of a streptococcal infection. However, in routine clinical practice, it may not be necessary. If diphtheria is suspected, a throat swab is essential and Albert stain may pick up *C. diphtheria* organisms.

OPTION 5

Other tests. No other tests are necessary in this child. However, in the case of uncertainty, one may consider a bacterial culture of a throat swab. As mentioned above, neutrophilic leucocytosis was found prior

Continued...

to abnormal localizing physical signs, urinalysis and chest x-ray may be ordered to rule out respective urinary tract infection and pneumonia. However, once localizing signs in the throat appear, other tests are not necessary.

In summary, an acute bacterial infection may not present with localization for the first few days and this is also true of non-bacterimic infections such as tonsillitis. Delay in starting antibiotic therapy in such a case is harmless, as it does not result in any complications including non-infective complications such as rheumatic fever or acute glomerulonephritis. Thus, an occasional delay in the starting antibiotic therapy in such a situation is considered rational. Otherwise acute viral pharyngitis may be treated unnecessarily with antibiotics.