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12th Edition



The Short Textbook of Medical Microbiology

(Including Parasitology & Entomology)

Satish Gupte

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SECTION 5

Clinical Cases

31. Clinical Case Discussion

JAYPEE BROTHERS

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CHAPTER 31

Clinical Case Discussion

JAYPEE BROTHERS

CASE 1

Chaman, a 55-year-old male, had weakness over one side of his body associated with speech loss for the last 20 days. A CT scan shows a lesion in the parietal area of the brain.

Q1. What is the likely clinical diagnosis?

Ans. It seems to be an infectious space occupying cerebral lesion.

Q2. What are the investigations required in this case?

Ans.

a. Blood culture
b. Aspiration of the lesion if possible

Q3. What are the other diagnostic possibilities?

Ans. Pyogenic lesions, tubercular, fungal, nocardial, cysticercosis, and poxilomosis are other possibilities. Neoplasm should also be considered.

Q4. What is the treatment recommended?

Ans. Appropriate antibiotics may be given after antimicrobial susceptibility tests.

CASE 2

Ram, 39 years of age, reported with general weakness and fever for the last 20 days. He got extraction of tooth four months back. He had a cardiac prosthetic valve 8 years back. On examination, pansystolic murmurs were noticed on auscultation.

Q1. What is the probable diagnosis?

Ans. Subacute infective endocarditis.

Q2. What is the major microbiological investigation required that gives lead to the diagnosis?

Ans. Blood culture.

Q3. Isolation of which microbe is expected in this case?

Ans. *Streptococcus viridans.*

Q4. Antimicrobial susceptibility test required in this case?

Ans. Quantitative antimicrobial susceptibility tests, such as MIC, MBC.

Q5. What did the dentist overlook in this patient?

Ans. The dentist did not take proper history, particularly of the prosthetic cardiac valve. Otherwise, preventive antibiotics before extraction of the tooth could prevent cardiac infection.

CASE 3

Harry, 25 years male, reported to a private clinic with significant weight loss, associated with fever and cough for the last one month. His Wild test, X-ray chest is reported negative. On clinical examination, generalized lymphadenopathy was detected. He was found to be infected with diseases, such as prolonged diarrhea, herpes zoster, candidiasis.

Q1. What is the probable diagnosis?

Ans. AIDS

Q2. Give the Gene coding for care HIV.

Ans. Gag

Q3. Which investigation is most suitable during the window period of AIDS?

Ans. RT-PCR

Q4. What is the appropriate indicator of HIV prognosis?

Ans. HIV RNA

Q5. Enumerate preventive measures of perinatal HIV infection.

Ans.

- ART of HIV individual antiretroviral therapy to be initiated in mother
- ART of infant born to HIV positive mother within 48 hours of birth
- ART of infected mother

CASE 4

Nanu, a male child of one year, has cough off and on, low-grade fever, failure to grow. Tuberculin test positive, TB IgM positive, X-ray chest shows hilar node and adjoining lung lesions.

Q1. What is the probable diagnosis?

Ans. Primary complex.

Q2. Define primary complex.

Ans. Primary complex comprises of a focal parenchymal lesion typically in the mid-lower zone with enlarged draining hilar/peripheral lymph nodes.

Q3. Give differences between primary and secondary tuberculosis disease.

Ans. Primary tuberculosis causes middle and lower lobe infection along with mediastinal adenopathy. On the other hand, secondary tuberculosis commonly involves upper lobes causing opacities, cavities, or fibrotic tissue scar.

Q4. What is the cause of primary complex?

Ans. Inhaled bacilli pass into lungs where damage is confined to one segment with involvement of hilar lymph node. This gives rise to primary complex.

CASE 5

Ketu, a 45-year-old male, reported to the medicine OPD with abdominal discomfort, headache for the last 7 days. He had fever that is intermittent and exhibits step ladder pattern. On examination, he was found quite toxic with a temperature of 103°C with coated tongue and splenomegaly.

Q1. What is the possible diagnosis?

Ans. Fever 103°C, coated tongue, splenomegaly suggests enteric fever.

Q2. Enumerate vaccines available for typhoid fever.

Ans.

1. VI antigen capsular polysaccharide (VI-CPS) vaccine
2. Vi-rEPA capsule vaccine
3. Typhoral (oral live attenuated *Salmonella typhi)* Ty21a vaccine
4. Parenteral TAB vaccine

Q3. What is the infective dose of *Salmonella typhi*?

Ans. 10 to 100 bacilli.

Q4. In typhoid patient, 21 days fever which test is appropriate?

Ans. Widal's test.

Q5. In Widal test, TO and TH rise of titer is interpreted as:

Ans. *Salmonella typhi* infection.

Q6. Antibodies against which antigen appear in enteric fever carriers?

Ans. VI antigen.

Q7. Which is the drug of choice in enteric fever?

Ans. Ceftriaxone.

CASE 6

Mrs Krishna, a 35-year-old female reported to OPD with abdominal pain in the upper quadrant since 24 hours duration. She was diagnosed as a case of acute cholecystitis. Her condition worsened with BP dropping (80 milimeter/45 milimeter g). Her blood culture showed growth of *Staphylococcus aureus*.

Q1. What is the likely diagnosis?

Ans. It seems a case of septicemia following cholecystitis.

Q2. How could her serious condition be prevented?

Ans. Immediate administration of suitable antibiotics without waiting for laboratory report of antibiotic sensitivity.

Q3. What laboratory investigations should have been done on priority basis?

Ans. Culture of bile along with antibiotics susceptibility test.

CASE 7

Raju, a 6-year-old boy having fever, joint pain, joint swelling with tachycardia, chest pain and murmur.

Q1. What is the possible diagnosis?

Ans. Rheumatic fever.

Q2. What laboratory investigations are required to establish diagnosis?

Ans.

- ASO titer
- CRP
- Hb
- WBC

Q3. What does ASO titer more than 400 Todd units suggest?

Ans. Rheumatic fever.

Q4. Which streptococcal serotypes are responsible for rheumatic fever?

Ans. Serotypes of rheumatic fever are: 1, 3, 5, 6, 14, 18, 19, 24, 27, 29

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Q5. What is the treatment recommended for rheumatic?

Ans.
- Procaine penicillin 4 to 8 lakh units I/M daily for 10 days.
- Bed rest for 2 to 6 weeks.

Q6. Mention the prophylactic measures.

Ans. Injection endures 12 lac units I/M every 3 weeks up to 25 years.

CASE 8

Pardeep, a 37-year-old male reported to medical OPD with fever for last ten days, headache, painful muscles, jaundice and respiratory failure.

Q1. What zoonotic disease is the possibility?

Ans. Leptospirosis is zoonotic disease transmitted through fresh water and edibles contaminated by rat urine.

Q2. What is the clinical feature of patient suffering of leptospirosis?

Ans. Nonspecific, self-limited fever, multiple organs failure (Weil's disease), acute kidney failure, jaundice, pulmonary hemorrhage, myocarditis, etc.

Q3. Name a few laboratory tests useful to establish diagnosis of leptospirosis.

Ans.
- Liver biopsy (stain for *Leptospira* species using Schiff strain, periodic Schiff strain, etc.).
- Serologic test to detect IgM.
- Nucleic acid amplification test (NAAT).
- Polymerase chain reaction (PCR)

Q4. Mention few characters of *Leptospira*.

Ans.
- *Leptospira* are 6 to 20 μ and spiral shaped.
- Gram-negative bacilli.

Q5. What are specimens required for NAAT?

Ans. Whole blood or serum.

Q6. Name confirmatory test to diagnose leptospirosis.

Ans. MAT which detects both IgM and IgG antibodies, others confirmatory tests are culture of leptospires. However, it is difficult to culture *Leptospira*. Detection of DNA of *Leptospira* from clinical samples is also useful.

CASE 9

S. Babli, a 34-year-old female attended OPD with complaints of foreign body, sensation of increased sensitivity to light for last few months. She is also having blurred vision. She is using contact lens for last four years.

Q1. What fungal infection of eye it can be?

Ans. Keratoconjunctivitis

Q2. Name three common fungi causing keratoconjunctivitis.

Ans.
- *Aspergillus fumigatus*
- *Aspergillus niger*
- *Penicillium*

Q3. Discuss possible pathology of keratocounctivitis.

Ans. Fungal spores invade injured tissue causing hypopyon ulcer, endophthalmitis ETC.

Q4. What is the treatment?

Ans.
- Flucuposine eyedrops
- Toxoplasma
- Toxocarid
- Acanthamoeba

CASE 10

Mr Abul Rehman, a 20-year-old male was suffering of low grade fever. On clinical examination, there were bilateral crests with respiratory rate of 25 per minute. His heart rate was 100 beats per minute. Blood culture was negative.

Q1. What is the possible diagnosis?

Ans. It can be systemic inflammatory response syndrome (SIRS).

Q2. How worsening of clinical condition of this patient can be prevented?

Ans. This patient must be kept under observation and may be given suitable antibiotics.

Q3. If the condition of SIRS patient worsened in next few days, blood culture may be done. Blood culture may reveal growth of *Streptococcus pyogenes*. Bronchoalveolar lavage may be subjected to Gram staining that may show gram positive cocci arranged in chains. Interpret.

Ans. It means sepsis is caused by *Streptococcus pyogenes*.

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CASE 11

Pinky, a 5-year-old female child having fever, vascular rash starting on trunk but more on limbs, polymorphic, i.e., papules, vesicles and scabs all observed at same time.

Q1. What is the probable diagnosis?

Ans. Chicken pox is the probable diagnosis.

Q2. Suggest preventive measures.

Ans. Valtrex varicella vaccine, 0.5 mL subcutaneous single dose is administered.

Q3. What is the proper treatment recommended?

Ans. Tabled Acyclovir 20 mg/kg body weight, 4 times a day for 5 days

- Syp. paracetamol, 1 tsp thrice daily
- Syp. cetirizine 1 tsp daily
- Antibiotic if vesicles are infected

CASE 12

Miss Fatima, an 18-year-old attended medical OPD with fever, severe colicky pain (lumbar area) moving to groin.

Q1. What is the likely diagnosis?

Ans. A young female presenting with fever, and pain in lumbar region suggests the diagnosis of acute pyelonephritis.

Q2. What can be the cause of colicky pain?

Ans. Possibly there is displacement of renal stones.

Q3. In this case, what are the findings of microscopic examination of uncentrifuged urine?

Ans.

- Pyuria
- Bacteriuria
- Gram stain reveals bacteria

Q4. How to manage this patient?

Ans.

- Removal of renal stones
- Antibiotic administration for 3 weeks

Q5. Which is the most common bacteria responsible for acute pyelonephritis?

Ans. Significant growth of *Escherichia coli*.

Q6. Give the preventive measures to check urinary infections.

Ans.

- Surgical removal of renal stones
- Prostatectomy in old male patients

CASE 13

Kuldeep, a 55-year-old presented himself at medical OPD with high fever, breathlessness, severe cough and pain in chest. On examination, he was found having fever, pulse rate 128 per minute, respiratory rate 40 per minute. On percussion, dullness over right middle zone (chest) was found. Gram stain of sputum showed Gram-negative bacilli. Culture of sputum shows growth of *Klebsiella pneumoniae*.

Q1. What is the possible diagnosis?

Ans. Community-acquired pneumonia.

Q2. What is pneumonia?

Ans. Inflammation of air sac (alveoli) of one or both lungs. If both lungs are involved, it is called double pneumonia.

Q3. What is the indication of severity of pneumonia?

Ans. Breathing rate, pulse rate, high fever, severe cough, reduced PaO_2 levels, etc.

Q4. Is there any chance of finding more than one organisms? If yes, Why?

Ans. Specimen of sputum collected is likely to get mixed up with saliva that is likely to have number of other organisms (normal flora).

Q5. What causes *Klebsiella pneumoniae*?

Ans. *Klebsiella pneumoniae* directly enters the body due to person-to-person contact.

Q6. What antibiotics kills *Klebsiella pneumoniae*?

Ans. Ciprofloxacin is the best antibiotic to inhibit the growth of *Klebsiella pneumoniae*.

CASE 14

Raju, a 20-year-old male reported to OPD on 1st December 2021 with fever, body pain, sore throat, cough, chest pain and shortness of breath. He also complained of headache.

Q1. What is the possible diagnosis?

Ans. As it was pandemic period of COVID-19 disease, so possibility of COVID-19 can be considered.

Q2. How COVID-19 spreads?

Ans. Aged patients with chronic diseases like diabetes, heart patients are likely to get COVID-19 by droplet transmission.

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Q3. How COVID-19 transmission can be prevented?

Ans.
- Isolation of COVID-19 patients
- Vaccination

Q4. What rapid test is helpful in the earliest diagnosis of COVID-19 disease?

Ans. Chromatographic immunoassay test report is available within on hour.

Q5. What is timeline of COVID-19 disease?

Ans.
- Day 0 : Infection
- Day 1 to 5 : Asymptomatic
- Day 0 to 5 : Onset of symptoms
- Day 0 to 7 : Window period (PCR positive)
- Day 1 to 28 : COVID-19 RNA and antigen positive
- Day 14 : IgG positive
- Day 14 to 21 : Decline stage (ineffective)
- Day 1 to 28 : Convalescence (infective)

Q6. What is the role of CRP, LDH, D-dimer, troponin and serum ferritin tests?

Ans. These tests are prognostic markers. High values are risk factors for more severe disease like thromboembolic complications, heart damage leading to worst prognosis.

Q7. What is the cause of death in COVID-19?

Ans. Hypoxemic respiratory failure leading to acute respiratory distress.

CASE 15

Mr John, a 13-year-old male was on some broad spectrum antibiotic for last few weeks. He developed vomiting, diarrhea and pain in abdomen. On advanced examination, he was found to have pseudomembrane in colonic mucosa, i.e., white yellow plaques (to 2 mm) spread over colonic mucosa.

Q1. What is the probable diagnosis?

Ans. Pseudomembranous colitis.

Q2. Name the causative organisms.

Ans. *Clostridium difficile.*

Q3. Briefly describe the pathogenesis.

Ans.
1. Prolonged hospital stay.
2. Administration of antimicrobes (cephalosporin, vancomycin, metronidazole).
3. Toxin production (exotoxin) A, i.e., enterotoxin and exotoxin B (cytoxin).

Q4. Is there any chance of relapse of this infection after treatment?

Ans. It is common in 15 to 30% of cases.

Q5. Name highly specific laboratory test to diagnose this disease.

Ans. Biopsy by colonoscopy. It is highly specific but poorly sensitive test.

CASE 16

Mr Ashok has been suffering from fever (103°F) for about a month. He was admitted in the hospital for investigations. Laboratory investigations failed to suggest specific diagnosis. He was placed as a patient of PUO.

Q1. Enumerate 5 points hinting towards clinical condition called PUO.

Ans.
1. Fever over 103°F recorded at two occasion.
2. Illness runs over 3 weeks
3. Diagnosis remains uncertain even after thorough investigations and clinical evaluation.
4. Blood and urine culture is negative.
5. No known immunocompromising state.

Q2. Name causative factors responsible for PUO.

Ans.
1. Infection
2. Cancers
3. Noninfectious inflammation, e.g., SLE, rheumatoid arthritis, etc.
4. Granulomatous diseases, thermoregulatory diseases.

CASE 17

Mr Kirpa Ram a 22-year-old man with a history of multiple sex partners is admitted with unexplained fever, loss of weight, persistent diarrhea, generalized space lymphadenopathy since one month.

Q1. Discuss post exposure prophylaxis.

Ans.
1. Make available PEP kit to workers of the hospital free of cost.
2. TL+LR regimen, i.e., Tenofovir-Lamivodinde plus lopinavir retonavir.
3. Treatment must be initiated within 3 hours and it is to be continued for 28 days.

Q2. During the window period of AIDS, which is the best diagnostic test for patients?

Ans. RT-PCR

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Q3. State the reasonable and best indicator of HIV prognosis.

Ans. HIV-RNA

Q4. What carries the highest risk of HIV transmission?

Ans. Blood products.

Q5. Name HIV vaccine that is prepared by killed whole HIV virus.

Ans. SAV001-H

Q6. What is HAART?

Ans. Broadly, it is highly active antiretroviral therapy comprising of at least 3 antiretroviral to manually suppress the HIV and stop progression of disease.

CASE 18

The college students on an all India tour on reaching Lucknow reported emergency wing of hospital with fever, nausea, vomiting, pain abdomen and diarrhea. All of them had consumed Chinese rice at the station 4 to 7 hours before.

Q1. Which is the most common bacteria involved?

Ans. *Bacillus cereus.*

Q2. Vomiting followed by diarrhea may be because of which bacterial agent?

Ans. *Staphylococcus aureus.*

Q3. What is scombroid food poisoning?

Ans. It occurs after consumption of sea food. *Morganella morganii* is present as commensal in sea fish. It may convert histidine present in sea fish into histamine. This histamine may cause food poisoning after consuming sea fish.

CASE 19

A premature infant shows necrosis of bowel wall with mucosal sloughing. Additionally, this infant was of low-birth weight.

Q1. What is the possible diagnosis?

Ans. Possible diagnosis is necrotizing enterocolitis.

Q2. Which site of the bowel is most commonly involved?

Ans. Terminal part of ileum is involved with necrosis.

Q3. What are the complications of this syndrome?

Ans. Intestinal perforation, peritonitis and bacteremia

Q4. Enumerate the causative bacteria.

Ans. *Pseudomonas, Klebsiella, Escherichia coli* (011:B4), *Salmonella, Clostridium perfringens*, etc.

CASE 20

Mr Rajesh a 20-year-old man reported to medical OPD with passing blood and mucous stained stools along with pain in abdomen and loss of appetite for last one month. On stool microscopical examination, rounded cysts were detected.

Q1. What is the possible diagnosis?

Ans. Intestinal amoebiasis

Q2. State the characteristic features of chronic ulcers of intestine.

Ans.
- Ulcer is small and superficial
- Ulcer is scarring
- Excessive adhesion with neighboring areas

Q3. In which part of intestine are common lesion found?

Ans. Cecum.

Q4. Mention the latest technologies in laboratory diagnosis of intestinal amoebiasis.

Ans.
- DNA probes
- Counter current immunoelectrophoresis
- Latex agglutination
- Culture on Craig's medium

Q5. Discuss in brief pathogenesis of *Entamoebid histolytica*.

Ans.
- Invasiveness depends on particular zymedens
- Invasiveness correlates with phagocytic process, collagenases, immunologic cytotoxic proteins, host's inflammatory response and capacity to induce histolysis.
- Bacteria may enhance pathogenesis.

Q6. Enumerate lesions produced by *Entamoeba histolytica*.

Ans.
- Dysentery (blood and mucous containing stools)
- Chronic intestinal amoebiasis
- Amoebic hepatitis and amoebic liver abscess, multiple amoebic abscesses of lungs.
- Small cerebral abscess of brain (cerebrum)
- Splenic abscess
- Amoebic vaginitis
- Amoebic ulcers of penis

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