Use of Fluoroquinolones for acute respiratory tract infections

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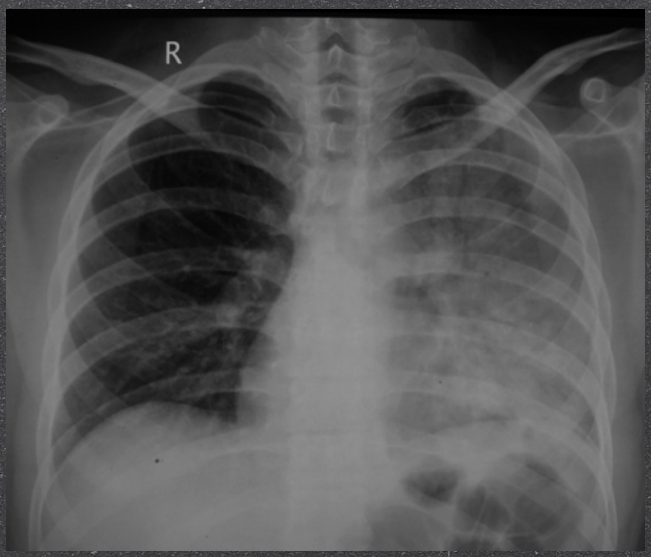
Case - history

- 22-year-old male graduate student presenting to a tertiary care institute in Mumbai, India
- 10-day history of high-grade fever, cough with minimal yellowish expectoration and breathlessness.
- No history of hemoptysis /weight loss/recent travel/exposure to persons with similar symptoms
- Past medical history unremarkable
- Presumptively treated by his general practitioner with a course of the antimalarial Chloroquine for 3 days along with Levofoxacin 500mg once a day for 5 days
- Subjective improvement during the course of treatment
- 3 days after stopping the antibiotic, his symptoms significantly worsened and he was referred for further management

Case - clinical examination

- Febrile : axillary temperature 102°F
- Tachycardic, pulse of 120 beats/minute with a regular rhythm
- Respiratory rate 40 breaths/minute, using his accessory muscles of respiration
- Blood pressure 106/79 mm Hg
- Oxygen saturation, measured using a pulse oximeter was 82 percent on room air
- Respiratory system examination revealed decreased movements on the left side, with an impaired note on percussion in the left inter-, infra- scapular and axillary regions, and decreased breath sounds on auscultation in the same areas.

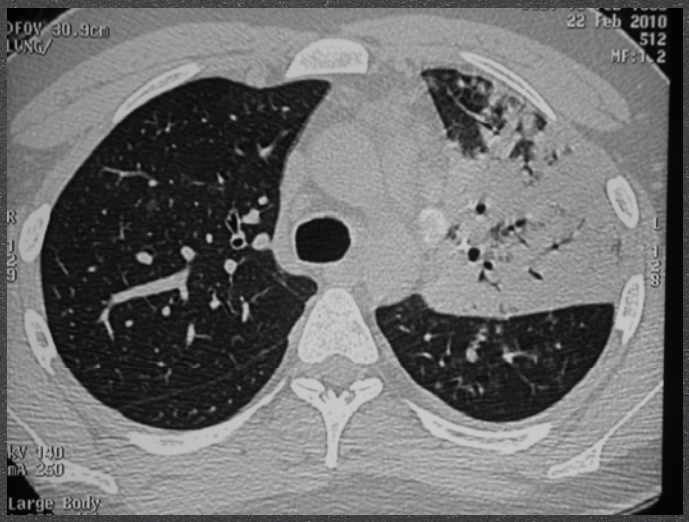
Case - chest radiograph



Acute febrile hypoxemic respiratory illness: lab work up

- Normal leucocyte count - 7,600 cells/μL (65% neutrophils, 25% lymphocytes, 5% monocytes and 2% eosinophils)
- Erythrocyte sedimentation rate - 30 mm/h
- Arterial blood gases - hypoxemia with respiratory alkalosis (pH-7.50, $paCO_2$- 29mmHg, paO_2 – 65mmHg, HCO_3^- - 20mEq/litre, FiO_2-60 percent delivered through a bilevel positive pressure ventilator)
- HIV negative by ELISA test
- Failed to expectorate sputum for an examination

CT chest



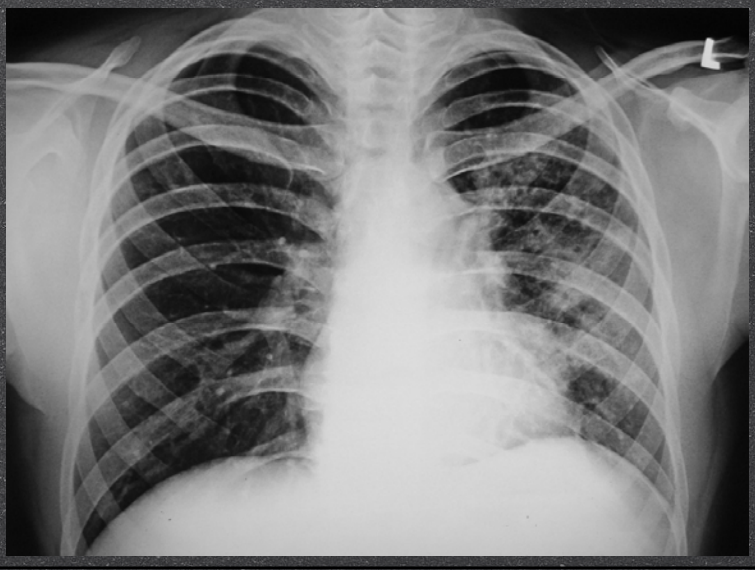
Case - clinical course

- Treated with intravenous ceftriaxone at a dose of 1gm twice a day along with azithromycin at a dose of 500mg once a day
- Serology for Chlamydia and Mycoplasma negative
- Tests for urinary legionella and pneumococcal antigens negative
- Throat swab for H1N1 virus negative
- Continued to remain febrile and tachypneic after 5 days of therapy
- Fiberoptic bronchoscopy with bronchoalveolar lavage(BAL) done

Case - clinical course

- Gram stain on the specimen revealed gram-positive cocci along with weakly-gram positive rods
- Z-N staining revealed acid-fast bacilli
- Started on four-drug antituberculous therapy
- Responded well clinically; discharged after being afebrile for 72-hours a week after starting the antituberculous treatment
- 3-week culture of BAL fluid confirmed growth of *Mycobacterium tuberculosis* susceptible to first line drugs
- Satisfactory clinical, microbiological and radiological recovery
- Declared cured after completing six months of treatment

Case - radiograph at the end of treatment



Learning points - acute TB

- TB usually has a smouldering onset and progression - bacilli multiply every 18 to 24 hours
- Cough, weight loss, anorexia, night sweats and malaise usually present for a few weeks
- In relatively rare circumstances the disease can present as an acute pneumonia with respiratory failure, masquerading as a community acquired pneumonia(CAP)
- Can result from the primary infection, progressive primary disease, reactivation of latent TB, or atlectasis caused by the effects of compression or rupture of enlarged tuberculous lymph nodes
- The incidence of TB being diagnosed among patients presenting as CAP has varied across series and can be as high as 35 percent of microbiologically confirmed pneumonias, the incidence being higher in the HIV-positive subgroup
- In hospital series, incidence of acute respiratory failure secondary to tuberculous acute pneumonia has been reported to be close to 1.5%

Learning points - consequences of empiric treatment of TB as CAP

- Delays in diagnosis and institution of antituberculous therapy, known to cause increased morbidity and mortality, and increase the risk of forward transmission
- Use of fluoroquinolones in the management of tuberculosis misdiagnosed as CAP can lead to acquisition of resistance to fluoroquinolones during the period that the bacillary load is exposed to monotherapy
- A course of fluoroquinolone monotherapy for as short a duration as 13 days has been reported to select resistant mutants
- Fluoroquinolones are one of the most potent drugs in the treatment of multidrug resistant TB, and propagation of resistance would accelerate the selection of XDR- and pre-XDR mutants.

Learning points - clues to suspect TB

- Chronicity of symptoms, presence of pleural effusions, unsatisfactory response to standard empiric antibiotics or a transient improvement with the use of fluoroquinolones followed by deterioration on cessation of therapy
- Normal leucocyte counts, weakly gram-positive or gram-neutral rods on sputum smear examination
- History of prior tuberculosis or close contact with a patient suffering from tuberculosis
- Immunosupressive states such as diabetes, renal failure, gastrectomy,HIV, corticosteroid therapy, tumor necrosis factor – alpha inhibitor therapy, post-transplantation state
- Patients from countries that are endemic for TB and among immigrants from such countries.

Learning points - treatment of acute TB

- Treatment does not change based on the severity of the initial presentation
- The beneficial effects of the addition of corticosteroids in the presence of respiratory failure are not proven, and not recommended by standard guidelines

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