BEST PRACTICES

Stepwise Approach to Severe Community Acquired Pneumonia (CAP)

Based on 2019 Clinical Practice Guideline of the American Thoracic Society and Infectious Diseases Society of America

Severity Assessment

2007 Infectious Diseases Society of America/American Thoracic Society Criteria

Presence of 1 major or 3 minor criterion requires admission to ICU.

Major Criteria:

1. Invasive mechanical ventilation
2. Septic shock requiring vasopressors)

Minor Criteria

1. Confusion
2. RR > 30 bpm
3. PaO2/FiO2 < 249
4. Multilobar infiltrates
5. BUN>20 mg/dL
6. WBC <4000/mm3,
7. Platelet count<1,000,000/mm3
8. Temperature < 36 °C
9. Hypotension requiring fluid resuscitation

Empiric Antibiotics

β-Lactam + macrolide*
OR
β-lactam + fluroquinolone†

*Ampicillin + sulbactam 1.5–3 g q6 hours, cefotaxime 1–2 g q8 hours, ceftriaxone 1–2 g daily, or ceftaroline 600 mg q12 hours AND azithromycin 500 mg daily or clarithromycin 500 mg twice daily.

†Levofloxacin 750 mg daily or moxifloxacin 400 mg daily.

Anaerobic coverage for suspected aspiration pneumonia is not routinely recommended.

Stronger evidence in favor of β-lactam/macrolide combination.

Antiinfluenza treatment, such as oseltamivir for positive influenza or remdesivir for positive SARS-CoV-2.

Add MRSA/P. aeruginosa coverage with history of prior respiratory isolation of MRSA/P. aeruginosa or recent hospitalization and parenteral antibiotics.

Investigations

CBC, BMP, LFTs.
Sputum gram stain, C & S, blood cultures.
NP swab for influenza§, RSV, and COVID-19.
Urine legionella and pneumococcal antigens
CRP & procalcitonin.
CXR

Investigations are are sent simultaneously with resuscitation and empirical antibiotic initiation.

When influenza viruses are circulating in the community, influenza nucleic acid amplification test is the preferred test.

Procalcitonine is not recommended to determine the need for initial antibacterial therapy but helpful in determining response to and duration of antibiotics.

Supportive Therapies

Fluid therapy
Vasopressor support
Respiratory support
Corticosteroids*

Surviving sepsis campaign (SSC) guidelines are recommended for supportive care in patients with sepsis and septic shock.

Respiratory support includes oxygen supplementation, high flow nasal cannula, BiPAP, or mechanical ventilation dependent on the level of hypoxemia and the work of breathing.

*The routine use of corticosteroids as an adjunctive therapy for severe CAP with brisk inflammatory response has been suggested by some RCTs and meta-analyses but as per the SSC guidelines, it is not recommended.

Hydrocortisone 50 mg q8 hours is recommended in refractory septic shock associated with CAP.

Clinical Response

Improvement in clinical course of the patient is apparent within 3 days, as assessed clinically by Halm's clinical stability criteria‡

‡Temperature ≤ 37.8 °C, heart rate ≤ 100 bpm, respiratory rate ≤ 24 bpm,
SBP ≥90 mmHg, O2 saturation ≥ 90%, or arterial O2 tension ≥ 60 (on room air),
normal mental status, and normal oral intake.

Failure to improve may be caused by treatment failure due to infection caused by pathogens that are not covered by the emperic antibiiotics or by infectious complications such as parapneumonic effusions, empyema, lung abscess, bronchial obstruction.

Old Age, presence of co-morbidities, severe infections with organisms like Gram negative bacilli, Legionella, Staphylococcus aureus are predictors of slow response and may take 7-10 days for improvement.

Repeat CXR is not routinely recommended with clinical improvement.

Duration of Antibiotics

Minimum of 5 days guided by clinical response

Duration of antibiotic therapy should be guided by a validated measure of clinical stability (resolution of vital sign abnormalities [heart rate, respiratory rate, blood pressure, oxygen saturation, and temperature], ability to eat, and normal mentation), and antibiotic therapy should be continued until the patient achieves stability and for no less than a total of 5 days.

An associated improvement in biomarkers (CRP reduction <50%, reduction in procalcitonin) may also be used as a guide to response.

March 21, 2023