

## Case Report

# Quick diagnostic and management community acquired pneumonia at Sumbawa hospital: a case report

Muhammad Ahmad Syammakh<sup>1\*</sup>, Elim Jusri<sup>2</sup>, Gede Agung Setya<sup>2</sup>, Made Aryadi Sukartika<sup>2</sup>

<sup>1</sup>Department of Emergency, Sumbawa General Hospital, NTB, Indonesia

<sup>2</sup>Department of Internal Medicine, Manambai Abdul Kadir Hospital, NTB, Indonesia

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### \*Correspondence:

Dr. Muhammad Ahmad Syammakh,

E-mail: muhammadahmadsyammakh@gmail.com

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## ABSTRACT

Pneumonia is most common cause of respiratory distress an infection of the pulmonary parenchyma. Despite being the cause of significant morbidity and mortality, it is often misdiagnosed, mistreated, and underestimated. Pneumonia historically was Typically classified as community-acquired (CAP), hospital-acquired (HAP), or ventilator-associated (VAP). A 68-year-old male was sent to the emergency department from clinic with an oxygen saturation of 86%. She has fevers with cough and generalized weakness for one week. She had been evaluated by her primary care provider on day two of illness and was started empirically on cefixime without improvement of her symptoms. The patient arrived febrile, tachycardic, tachypneic, and hypoxic on room air with right-sided crackles on exam. Lung Ultrasound of the right lower lobe demonstrates lung hepatization, a classic finding for pneumonia. In addition, a shred sign is present with both air bronchograms and focal B lines-all suggestive of poorly aerated, consolidated lung. Authors critically evaluate the evidence for the use lung ultrasound for rapid diagnostic. It is important to understand this disease, rapid diagnostic with ultrasound and when treated promptly and effectively, these patients will rapidly recovery. Good oxygenation, intravenous Antibiotic, intravenous fluids and symptomatic treatment which should be started within minutes of the patients' arrival to emergency department.

**Keywords:** Antibiotic, Lung ultrasound, Oxygenation, Pneumonia, Rapid diagnostic

## INTRODUCTION

Pneumonia is an infection of the pulmonary parenchyma. Despite being the cause of significant morbidity and mortality, it is often misdiagnosed, mistreated, and underestimated. Pneumonia historically was Typically classified as community-acquired (CAP), hospital-acquired (HAP), Or ventilator-associated (VAP). A Fourth category, health care- associated pneumonia (HCAP), was introduced recently.<sup>1-4</sup> This category Was meant to encompass those cases of CAP that were caused by multidrug-resistant (MDR) Pathogens typically associated with HAP. Unfortunately, the original definitions appear to have been overly sensitive, resulting

in the treatment of a high proportion of patients who had community-onset pneumonia with broad-spectrum antibiotics consistent with HAP treatment. Retrospective studies have actually suggested a worse outcome when broad-spectrum antibiotics were used in these cases.<sup>2-3</sup>

Pneumonia results from the proliferation of microbial pathogens at the alveolar level and the host's response to those pathogens. Microorganisms gain access to the lower respiratory tract in several ways. The most common is by aspiration from the oropharynx. Small-volume Aspiration occurs frequently during sleep (especially in the elderly) and in patients with decreased levels of consciousness. Rarely, pneumonia occurs via

hematogenous spread (e.g., from tricuspid endocarditis) or by contiguous extension from an infected pleural or mediastinal space. Mechanical factors are critically important in host defense. The hairs and turbinates of the nares capture larger inhaled particles before they reach the lower respiratory tract. The branching architecture of the tracheobronchial tree traps microbes on the airway lining, where mucociliary clearance and local antibacterial factors either clear or kill the potential pathogen. The gag and cough reflexes offer critical protection from aspiration. In addition, the normal flora adhering to mucosal cells of the oropharynx, whose components are remarkably constant, prevents pathogenic bacteria from binding and thereby decreases the risk of pneumonia.<sup>4-7</sup> When these barriers are overcome or when microorganisms are small enough to be inhaled to the alveolar level, resident alveolar macrophages are extremely efficient at clearing and killing pathogens. Macrophages are assisted by proteins that are produced by the alveolar epithelial cells (e.g., surfactant proteins A and D) and that have intrinsic opsonizing properties or antibacterial or antiviral activity. Once engulfed by the macrophage, the pathogens—even if they are not killed—are eliminated via either the mucociliary elevator or the lymphatics and no longer represent an infectious challenge. Only when the capacity of the alveolar macrophages to ingest or kill the microorganisms is exceeded does clinical pneumonia become manifest. In that situation, the alveolar macrophages initiate the inflammatory response to bolster lower respiratory tract defenses. The host inflammatory response, rather than proliferation of microorganisms, triggers the clinical syndrome of pneumonia. The release of inflammatory mediators, such as interleukin 1 and tumor necrosis factor, results in fever.<sup>4</sup>

### CASE REPORT

A 68-year-old male was sent to the emergency department from clinic with an oxygen saturation of 86%. He complained about cough, progressing to rusty colored sputum, sudden onset of chills the previous evening, subjective fever, and malaise. He felt some sharp right-sided chest pain after a particularly long bout of coughing. He denied any leg swelling, orthopnea, or left-sided/substernal chest pain. He also denied any gastrointestinal symptoms (no nausea, vomiting, or diarrhea). His past medical history included hypertension and hypercholesterolemia. He had been evaluated by her primary care provider on day two of illness and was started empirically on cefixime without improvement of her symptoms.

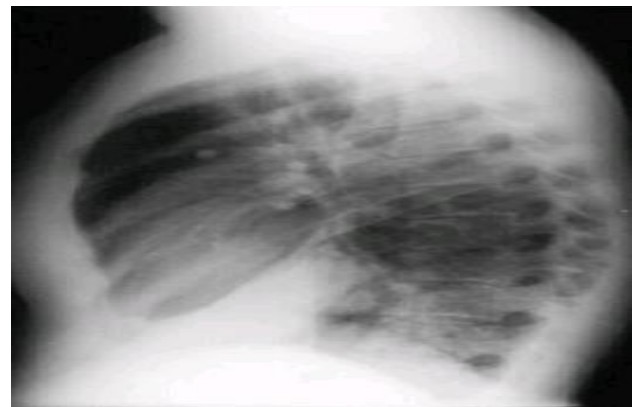
#### *On physical examination*

- BP: 130/70mmhg
- RR: 34x/bpm
- HR: 132xbpm
- Temp :39 celcius
- Sp.O2 86% on room air.

Lung examination tachypnoe, work of breathing increase and Rales a/r right basal lobe.



**Figure 1: CXR showing opacity the right lower lobe with air bronchogram(+) suggestive right lower lobe pneumonia.**



**Figure 2: Lateral CXR look a consolidation with air bronchogram(+), increased bronchovesicular suggestive right lower lobe pneumonia.**



**Figure 3: Bedside ultrasound hepatization of lung with air bronchogram(+) right basal lobe.**

ECG evaluation it's non-specific include tachycardia sinus, with PR interval, ST segment are normally. An urgent bedside ultrasound it's performed and authors

comparison with X ray. Sugar stik 115mg/dl, blood laboratory includes CBC, LFT, RFT, electrolyte, Trop T, BGA, blood culture still working. Community acquired pneumonia (CAP) is a medical emergency with early diagnostic, early recognition, and prompt initiation of treatment is the key to preventing morbidity and mortality. Immediate ED management of CAP has it impact with on subsequent clinical course, rate of invasive ventilation mechanic and rate in ICU. In Emergency department first, authors give high flow Oxygenation NRBM 10ltr for resolve hypoxic patient, after that iv access with large borge canule 16G, take blood order to lab. Board spectrum antibiotic with levofloksasin 750mg iv once daily and treat the

symptomatic like a fever and cough with sputum with Paracetamol and ambroxol (Figure 1-3).

**DISCUSSION**

Pneumonia is an infection of the pulmonary parenchyma. Despite being the cause of significant morbidity and mortality, it is often misdiagnosed, mistreated, and underestimated. Pneumonia historically was typically classified as community-acquired (CAP), hospital-acquired (HAP), or ventilator-associated (VAP). A fourth category, health care associated pneumonia (HCAP), was introduced recently.<sup>1-4</sup>

**Table 1: Risk factors for pathogens resistant to usual therapy for community-acquired pneumonia.<sup>1-3</sup>**

| MDR Gram negative bacteria and MRSA        | Nosocomial MRSA                             | Community acquired MRSA                           |
|--|---|---|
| Hospitalization > 2days in previous 90days | Hospitalization > 2days in previous 90 days | Cavity infiltrate or necrosis<br>Gross hemoptysis |
| Use Antibiotics in previous 90days         | Use antibiotics in previous 90 days         | Neutropenia<br>Erythemathous rash                 |
| Immunosupression                           | Chronic Hemodialysis in previous 30days     | Concurent influenza                               |
| Non Ambulatory status                      | CHF   | Young, previously healthy status                  |
| Tube feedings gastric acid                 |   |   |
| Severe COPD/Bronchiectasis                 | Gastric acid suppression                    | Summer month onset                                |

This category was meant to encompass those cases of CAP that were caused by multidrug-resistant (MDR) pathogens typically associated with HAP.

Unfortunately, the original definitions appear to have been overly sensitive, resulting in the treatment of a high proportion of patients who had community-onset pneumonia with broad-spectrum antibiotics consistent with HAP treatment. Retrospective studies have actually suggested a worse outcome when broad-spectrum antibiotics were used in these cases (Table 1).<sup>5-8</sup>

Although *Streptococcus pneumoniae* is most common, other organisms must also be considered in light of the patient’s risk factors and severity of illness. Separation of potential agents into “typical” bacterial pathogens or “atypical” organisms may be helpful.

The former category includes *S. pneumoniae*, *Haemophilus influenzae*, and (in selected patients) *S. aureus* and gram-negative bacilli such as *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*. The “atypical” organisms include *Mycoplasma pneumoniae*, *Chlamydia pneumoniae*, and *Legionella* species as well as respiratory viruses such as influenza viruses, adenoviruses, human metapneumovirus, and respiratory syncytial viruses (Table 2).<sup>4-8</sup>

**Table 2: Epidemiologic factors suggesting possible causes of community-acquired pneumonia.<sup>4-6</sup>**

| Factors                           | Possible pathogen(S)   |
|-----------------------------------|--|
| Alcoholism                        | <i>Streptococcus p</i> , oral Anaerobes, <i>Kleibsella Proteus</i>     |
| COPD and / or smoking             | <i>Haemophilus influenzae</i> , <i>Pseudomon a</i> , <i>Legionella</i> |
| Structural lung disease           | <i>P. aeruginosa</i> , <i>Staphlococcus aureus</i>                     |
| Lung abscess                      | CA-MRSA, oral anaerobes, endemc fungi                                  |
| Travel to Asia                    | Avian influenza virus, Hantavirus                                      |
| Stay in hotel in previous 2 weeks | <i>Legionella spp.</i>   |

The use of lung ultrasound in the evaluation of pneumonia is growing rapidly and in each clinical setting shows increased efficiency as accurate bedside diagnosis is made possible. Pulmonary consolidations that abut the pleura allow transmission of ultrasound waves, although with the loss of normal A-line artifacts. Further sonographic differentiation relies upon evaluation of the homogeneity and echogenicity of the lesion, as well as the shape, margin characteristics, and presence or absence of air bronchograms.<sup>9</sup>

In this case, pneumonia is the most likely pathological entity given both the clinical context and imaging findings. Bacterial pneumonias typically display 'hepatization' early in their course, with an echogenicity approximating that of the liver, save for the characteristic fine, branching echogenic structures which move with respiration.<sup>9</sup> Some authors contend the presence of these dynamic air bronchograms are not only highly specific for pneumonic consolidation, but also for a bacterial etiology.<sup>9</sup>

## CONCLUSION

Community-acquired pneumonia in elderly patients is a common and serious problem encountered in clinical practice. Elderly patients with community-acquired pneumonia have different clinical presentation and higher mortality. From this case study authors conclude that main how to rapid diagnostic with bedside ultrasound, good oxygenation, rapid use broad spectrum antibiotic make reduced rate of mechanic ventilation and length of stay in hospital.

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## REFERENCES

1. Angus DC, Marrie TJ, Obrosky DS, Clermont G, Dremsizov TT, Coley C, et al. Severe community-acquired pneumonia: use of intensive care services and evaluation of American and British Thoracic Society Diagnostic criteria. *Am J Resp Critical Care Med.* 2002 Sep;166(5):717-23.
2. Kellum JA, Kong L, Fink MP, Weissfeld LA, Yealy DM, Pinsky MR, et al. Understanding the inflammatory cytokine response in pneumonia and sepsis: results of the Genetic and Inflammatory Markers of Sepsis (GenIMS) Study. *Arch Internal Med.* 2007 Aug 13;167(15):1655-63.
3. Mandell LA, Anzueto A, et al. "Management of Community Acquired pneumonia in adults." *Infectious Disease Society of American Thoracic Society. Clin Infect Dis,* 2007. S27-S72.
4. Mandell LA. *In: Harrison Textbook of Principle Internal Medicine.* 20 Th. Mc Graw Hill;2018;5: 908-912.
5. Prina E, Ranzani OT, Torres A. Community acquired pneumonia. *Lancet.* 2015 Sep 12;386(9998):1097-108.
6. Restrepo MI, Mortensen EM, Rello J, Brody J, Anzueto A. Late admission to the ICU in patients with community-acquired pneumonia is associated with higher mortality. *Chest.* 2010 Mar 1;137(3):552-7.
7. Sligl WII, Marrie TJ. Severe community-acquired pneumonia. *Crit Care Clin.* 2013 Jul;29(3):563-601.
8. Woodhead M, Blasi F, Ewig S, Garau J, Huchon G, Ieven M, et al. Guidelines for the management of adult lower respiratory tract infections-full version. *Clin Microbiol Infection.* 2011 Nov 1;17:E1-59.
9. Litchenstein. Lung Ultrasound *In: The Critically Ill.* Springer. 2016;6:112-20.

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