



A Case Report: Pneumonia in Smoker

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ABSTRACT

Introduction. Pneumonia is now defined as inflammation of the lungs caused by microorganisms (bacteria, viruses, fungi, parasites). Pneumonia is still a major problem in the health sector and main cause of death, especially in developed countries. Pneumonia can occur more easily in people with predisposing factors, such as smokers, people with history of Tuberculosis, Immunocompromised patients, and in the groups of children as well as elderly.

Case Presentation. A 47 years-old man came to the hospital polyclinic with main complaint of breathlessness since one day before entering the hospital. The patient also complained of coughing since two weeks ago and producing green phlegm, no coughing up of blood and no runny nose. Patient also had a fever, the fever had been up and down for about five days, the fever was not accompanied by chills and sweats at night. On auscultation examination of the lungs, fine wet crackles were heard in the left and right lower lung fields. Based on the patient's history, physical examination and supporting examinations, the patient was diagnosed with pneumonia.

Conclusion Pneumonia can occur more easily in people with predisposing factors, such as smokers. The diagnosis of pneumonia is made based on the history and physical examination and is assisted by supporting examinations, including: radiological, laboratory and bacteriological examinations. Management of pneumonia is empirical antibiotics according to the suspected causative germ, and also supportive therapy according to the patient's clinical conditions.

Keywords: Pneumonia, Predisposition Factor, Smoker, Antibiotics

1. Introduction

Pneumonia is an acute lower respiratory tract infection in the lung parenchyma. Pneumonia is caused by microorganisms such as bacteria, viruses, fungi and parasites.^{1,2} Lower respiratory tract infections are still a major problem in the health sector, especially in developed countries. The 2012 WHO (World Health Organization) report states that lower respiratory tract infections, especially pneumonia, are ranked fourth as the highest cause of death in the world and at the same time the main cause of death from infectious diseases.¹ Pneumonia is classified into Community Pneumonia (CP) and Nosocomial Pneumonia (NP). Community pneumonia itself is pneumonia that occurs outside the scope of health facilities. Community pneumonia is different from nosocomial pneumonia which occurs after someone has been in the hospital for more than 48 hours. Community-based pneumonia is the most common type of respiratory infection, while nosocomial pneumonia is the second most common after that.^{1,2} Pneumonia is a serious case in the world because the number is quite large. Approximately 15-20% of the world's population suffers from pneumonia. Cases of community pneumonia occur in 11-12 per 1000 people in the world. Pneumonia also causes many deaths, approximately 3.5 million people die every year due to this disease.^{1,3}

WHO estimates that up to 1 million deaths are caused by the bacteria *Streptococcus pneumoniae*, and more than 90% of these deaths occur in developing countries. Deaths from pneumonia generally decrease with age until late adulthood. Seniors are also at particular risk for pneumonia and other disease-related deaths. In the UK, the annual incidence of pneumonia is approximately 6 cases for every 1000 people in the 18-39 age group. For those over 75 years of age, this increases to 75 cases for every 1000 people. Approximately 20-40% of individuals who require pneumonia contract hospital admission of which between 5-10% are admitted to critical care units. Similarly, the death rate in the UK is around 5-10%. These individuals are also more likely to have recurrent episodes of pneumonia. People who are hospitalized for any reason are also at high risk for pneumonia.¹ Pneumonia can be caused by various types of microorganisms, namely bacteria, viruses, fungi and protozoa. Community pneumonia suffered by people abroad is mostly caused by Gram Positive bacteria, while pneumonia in hospitals is mostly caused by Gram Negative bacteria, while aspiration pneumonia is mostly caused by anaerobic bacteria. Recently, reports from several cities in Indonesia have shown that the bacteria found from examining the sputum of community pneumonia sufferers are Gram Negative Bacteria.^{1,2}

In America, pneumonia is ranked sixth as a cause of death and is the infection most frequently associated with mortality. Approximately 2 million to 4 million Americans suffer from community-acquired pneumonia (CP) and 1 million of them have to undergo hospital treatment each year. A survey in England stated that 5-12% of lower respiratory tract infections that come to hospital are community-acquired pneumonia. Approximately 5 to 11 per 1000 people in the UK suffer from community-acquired pneumonia.^{2,3} Pneumonia is the cause of 15% of under-five deaths, which is estimated at 922,000 under-fives in 2015. Pneumonia attacks all ages in all regions, but occurs mostly in South Asia and sub-Saharan Africa. The population that is

susceptible to pneumonia is children aged under 2 years, elderly people over 65 years and people who have health problems (malnutrition, immunological disorders).³

The national estimate of pneumonia cases is 3.55%, but the estimated number of cases in each province uses different figures according to the figures that have been determined. (Indonesian Ministry of Health 2016). Until 2014, the coverage rate for the discovery of pneumonia in children under five had not experienced significant growth, namely ranging from 20% - 30%. In 2015 there was an increase to 63.45%. One of the causes of the increase in discoveries was the decrease in the pneumonia discovery target, which was previously the same for all provinces (10%), in 2015 using the 2013 Riskesdas results which were different for each province.^{1,2}

Pneumonia is now defined as inflammation of the lungs caused by microorganisms (bacteria, viruses, fungi, parasites). Pneumonia caused by *Mycobacterium tuberculosis* is not included. Meanwhile, lung inflammation caused by non-microorganisms (chemicals, radiation, aspiration of toxic materials, drugs, etc.) is called pneumonitis.² M. Pneumonia infection can be found throughout the world and is endemic. The highest prevalence of cases is usually from summer to early autumn, which can last one to two years. Infection is spread widely from one person to another by droplets when coughing. That is why infections seem to spread more easily between densely populated populations, for example in schools, dormitories, crowded residential areas and military camps.^{4,5,6}

2. Case Presentation

A 47 years-old man came to the hospital polyclinic with main complaint of breathlessness since one day before entering the hospital. Shortness of breath was not influenced by body position, activity and weather. This symptom was the first time happened to him. The patient also complained of coughing since two weeks ago and producing green phlegm, no coughing up of blood and no runny nose. Patient also had a fever, the fever had been up and down for about five days, the fever was not accompanied by chills and sweats at night. Fever went down with fever-reducing medication. The patient had no history of weight loss. The patient had history of tuberculosis. The patient had been an active smoker since the age of 14 years until now with a frequency of 4 to 5 cigarettes a day. The patient said he felt dizzy, his tongue felt bitter, and his throat hurt. The patient did not feel nauseous, vomited, and had no heartburn. He felt fatigue, but appetite was normal. He had normal urination and normal defecation.

On vital signs examination, it was found that the temperature had increased, which was 40° Celsius. On physical examination of the chest, there was dullness to percussion in the lower fields of the left and right lungs. On auscultation examination of the lungs, fine wet crackles were heard in the left and right lower lung fields. Other physical examinations were normal. A routine blood laboratory examination found Hb 13.7 gr/dl, leukocytes 20,000/mm³, Ht 34% and platelets 280,000/mm³. Based on the patient's history, physical examination and supporting examinations above, the patient was diagnosed with pneumonia.

Treatment for this patient was administration of O₂ 2-4 liters/i. The patient was required to be on bed rest. The patient was also given an RL infusion of 20 drops per minute. To treat infections caused by pneumonia, the patient was given intravenous antibiotics ciprofloxacin 400 mg 1 flash/12 hours combined with intravenous Ceftriaxone 1 gr/12 hours. The patient was also given Ambroxol Syr 3x1 a day for the cough.

3. Discussion

A 47 years-old man came to the hospital polyclinic with main complaint of breathlessness since one day before entering the hospital. The patient also complained of coughing since two weeks ago and producing green phlegm, no coughing up of blood and no runny nose. Patient also had a fever, the fever had been up and down for about five days, the fever was not accompanied by chills and sweats at night. On auscultation examination of the lungs, fine wet crackles were heard in the left and right lower lung fields. Based on the patient's history, physical examination and supporting examinations, the patient was diagnosed with pneumonia.

The clinical picture of pneumonia is usually characterized by fever, chills, increased body temperature which can exceed 40C, cough with mucoid or purulent sputum sometimes accompanied by blood, shortness of breath and chest pain. It can also be aimed at finding out possible causative germs related to predisposing factors such as COPD: H. Influenza, chronic diseases: more than one germ. Seizures / unconsciousness: Gram negative aspiration, anaerobes. Decreased immunity: gram negative. Drug addiction: staphylococcus. Apart from that, the causative germ can also be suspected from the location where the infection is transmitted. This patient was found to have shortness of breath, high fever, cough with purulent phlegm and the predisposing factor was being a smoker.^{6,7}

Physical examination findings on the chest depend on the extent of the lesion in the lungs. On inspection it can be seen that the affected part is left behind when breathing, on palpation the fremitus can harden, on percussion it is dull to dull, on auscultation bronchovesicular to bronchial breath sounds can be heard which may be accompanied by fine wet crackles, which then become rough wet crackles at the resolution stage. On physical examination of this patient's chest, he found dullness to percussion in the lower lung fields and fine moist rales on auscultation, which is one of the typical signs of pneumonia. On laboratory examination, there is an increase in the number of leukocytes, usually more than 10,000/ul, sometimes reaching 30,000/ul, and in the count of leukocyte types there is a shift to the left and an increase in ESR. To determine the etiological diagnosis, sputum examination, blood culture and serology are required. Blood cultures can be positive in 20-25% of untreated patients. Blood gas analysis shows hypoxemia and hypercarbia, in advanced stages respiratory acidosis can occur.^{8,9}

Apart from laboratory examinations, chest X-ray (PA/lateral) is the main supporting examination to confirm the diagnosis. Radiological features can range from infiltrates to consolidation with "air bronchogram", bronchogenic and interstitial causes as well as cavity images. Chest x-ray alone cannot specifically determine the cause of pneumonia, it is only a guide to the etiological diagnosis, for example the picture of lobar pneumonia is most often caused by *Streptococcus pneumoniae*, *Pseudomonas aeruginosa* often shows bilateral infiltrates or a picture of bronchopneumonia while *Klebsiella pneumoniae* often shows consolidation that occurs in the right upper lobe. although it can affect several lobes.^{10,11}

Pneumonia sufferers can be given empirical therapy aimed at the pathogen most likely to be the cause. If there are culture results, drug adjustments are made. In principle, the main therapy for pneumonia is the administration of certain antibiotics against certain germs in certain types of acute lower respiratory tract infections, whether pneumonia or other forms, and these antibiotics are intended as causal therapy against the germs that cause them. The factors considered in selecting antibiotics are as follows: Patient factors, namely the urgency or method of administering the drug based on the severity of the illness and general condition, immunological mechanisms, age, genetic or organ deficiencies, pregnancy and allergies. Next is the antibiotic factor, it is impossible to get one type of antibiotic that is effective for all types of germs. Therefore, it is important to understand various aspects of antibiotics for efficient use of antibiotics. The method of selecting antibiotics can be in the form of a single antibiotic: the one that is most suitable is chosen to be given to community-acquired pneumonia patients who are healthy and whose clinical picture is suggestive of being caused by certain sensitive germs. In addition, a combination of antibiotics is given with the aim of covering the spectrum of suspected germs, to increase spectrum activity and in multiple infections. If the results of culture and sensitivity tests have been obtained, these results can be used as a consideration for administering more targeted antibiotics or monotherapy.^{12,13,14,15}

Supportive therapy for pneumonia consists of¹⁴:

1. Oxygen therapy to achieve PaO₂ 80-100 mmHg or saturation 95-96% based on blood gas analysis.
2. Humidification with a nebulizer to thin thick phlegm, can be accompanied by a nebulizer to administer bronchodilators if there is bronchospasm.
3. Chest physiotherapy for phlegm removal, especially advice on coughing and deep breathing.
4. Fluid management must be managed properly, including in cases of circulation problems.
5. Corticosteroid administration in the severe sepsis phase needs to be given.
6. Inotropic drugs such as dobutmin or dopamine are sometimes needed if there are complications of circulatory disorders or prerenal kidney failure.
7. Mechanical ventilation.
8. Empyema drainage if present.
9. If there is respiratory failure, provide sufficient calorie nutrition, especially fat (>50%), so that excessive CO₂ production can be avoided.

Extrapulmonary complications of pneumonia can occur, for example in pneumococcal pneumonia with bacteremia found in 10% of cases in the form of meningitis, arthritis, endocarditis, pericarditis, peritonitis and empyema. Sometimes non-infectious extrapulmonary complications can be found which slow down the resolution of lung radiology images, and acute myocardial infarction can cause other complications in the form of acute respiratory distress syndrome (ARDS), multiple organ failure and further complications in the form of nosocomial pneumonia. The incidence of community pneumonia in the USA is 3.4-4 million cases per year, and 20% of them need to be hospitalized. In general, the death rate for pneumonia caused by pneumococci is 5%, but it can increase in older people with poor conditions. Pneumonia with influenza in the USA is the 6th cause of death with an incidence of 5%. Most of them are elderly, namely 89%. This high mortality is related to the "modifying factors" present in the patient. The mortality rate for nosocomial pneumonia can reach 33-50%, which can reach 70% if you include those who died due to the underlying disease they were suffering from. The cause of death is usually due to bacteremia, especially by *Ps. Aeruginosa* or *Acinoacter* spp.^{11,12}

4. Conclusion

Pneumonia is inflammation that affects the lung parenchyma, distal to the terminal bronchioles which include the respiratory bronchioles and alveoli, and causes consolidation of lung tissue and disruption of local gas exchange. Pneumonia can occur more easily in people with predisposing factors, such as smokers. The diagnosis of pneumonia is made based on the history and physical examination and is assisted by supporting examinations, including: radiological, laboratory and bacteriological examinations. Management of pneumonia is empirical antibiotics according to the suspected causative germ, and also supportive therapy according to the patient's clinical conditions.

5. References

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