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# A 44-YEAR-OLD MAN WITH BRONCHIAL ASTHMA: CASE REPORT

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**Abstract:** Bronchial asthma is a chronic disease characterized by shortness of breath, wheezing, chest tightness and coughing. Asthma cannot be cured, but it can be controlled to reduce and prevent asthma attacks. According to the World Health Organization, bronchial asthma affected around 262 million people in 2019 and caused 455.000 deaths. This case report describes a 44-year-old man, who came to the emergency room with complaints of shortness of breath and felt intermittent since the last two months and worsen one day before entering the hospital. Shortness of breath accompanied by complaints of coughing, fever, and wheezing. The patient has a history of asthma since he was a teenager. In the past month, asthma symptoms have been felt almost every day, often waking up at night, and there are limitations in doing activities when asthma relapses. Complaints of shortness of breath felt better after taking the fenoterol inhalation drug. On examination of vital signs obtained a temperature of 38.1ºC, 95% oxygen saturation, chest auscultation examination found wheezing during expiration. Routine blood laboratory examinations, normal results were obtained, whereas in chest X-rays, increased bronchovascular markings were found, suggesting a picture of bronchitis. The therapy given to the patient was in the form of oxygen nasal cannula 2 liters per minute, omeprazole IV injection 40 mg every 12 hours, ceftriaxone IV injection 2 grams every 24 hours, methylprednisolone IV injection 62.5 mg every 24 hours, acetylcysteine 1 capsule every 8 hours, paracetamol tablets every 8 hours if you have a fever, as well as nebulized Salbutamol – Ipratropium Bromide – Budesonide. During treatment the patient's condition improved. The patient was then allowed to be outpatient and given Formoterol – Budesonide inhalation therapy twice a day, one puff.

**Keywords:** asthma, therapy, shortness of breath, symptoms

## Introduction

Asthma is a heterogeneous disease, generally characterized by chronic airway inflammation. Asthma can happen to anyone and can occur at any age. Asthma is characterized by a history of respiratory symptoms such as wheezing, shortness of breath, feeling of tightness in the chest and coughing which can vary in time and intensity, together with variations in expiratory flow resistance. (Global Initiative for Asthma, 2022) Asthma cannot be cured, but it can be controlled to reduce and prevent asthma attacks. (Centers for Disease Control and Prevention)

According to the World Health Organization , asthma affects around 262 million people in 2019 and caused 455,000 deaths. (World Health Organization) The Centers for Disease Control and Prevention

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divides asthma by category, including: age, gender, and race. Based on age, the incidence of asthma <18 years was 5.8 % , while in adults it was 8.4%. The percentage of asthma is higher in women, which is 9.5% , while in men it is 6.1%. In addition, based on race, the percentage of white people is 7.7%, black is 10.4%, and Hispanic is 6.8%. (Centers for Disease Control and Prevention) CDC states that deaths from asthma have decreased over time, from 15 million in 2001 to 12.6 million in 2020. (Centers for Disease Control and Prevention) In Indonesia, from the Basic Health Research stated that the prevalence of asthma was based on different ages, including 1.6% for 1-4 years, 1.9% for 5-14 years, 2.3% for 35-44 years. %, and at the age > 75 years of 5.1%. (Kemenkes RI, 2018)

Factors that influence the incidence of bronchial asthma include host factors and environmental factors. Host factors include genetic factors, allergies (atopy), bronchial hyperreactivity, gender and race. While environmental factors include allergens, work environment sensitization, cigarette smoke , air pollution, respiratory infections (viruses), diet, and socio-economic status. The factors that affect bronchial asthma will be different for each individual. (PDPI, 2003)

The purpose of writing this case report is to report asthma cases in adults aged 44 years with several factors, namely weather, exposure to cigarette smoke, and a family history of asthma sufferers.

**Case Reports**

Mr. P, 44 years old , came to the emergency room at Roemani Hospital Semarang with the main complaint of shortness of breath. Shortness of breath has been felt intermittently since 2 months ago, and has been getting worse since 1 day before entering the hospital when the patient was working. Shortness of breath accompanied by wheezing, and the complaints do not decrease with changes in activity or position . In the past month, asthma symptoms have been felt almost every day, patients complain of frequent awakenings at night, and there are limitations in doing activities when asthma relapses. Complaints of shortness of breath felt better after taking the fenoterol inhalation drug . Other complaints: coughing up phlegm but hard to expel and fever.

The patient has a history of asthma since he was a teenager. Patients routinely take fenoterol inhalers when shortness of breath appears. History of hypertension, diabetes mellitus, heart disease, or allergies was denied. The patient has a family history of asthma, namely the patient's grandmother. The patient is a passive smoker, because he gets exposure to cigarette smoke from people around him. Previously, the patient was an active smoker (+), spent 3 packs of cigarettes a day for 12 years, but had stopped since 2007.

Examination of the general condition of the patient appeared to be moderately ill, compos mentis consciousness. Examination of vital signs obtained blood pressure 137/85 mmHg, heart rate 88x/minute, respiratory rate 20x/minute, $SpO_2$ 95%, and temperature 38.1ºC. The patient's nutritional status was normal. Generalized status of the head, eyes, nose, ears, mouth, neck, cor, abdomen and extremities within the normal limits. Examination of the thoracic pulmo found a basic vesicular sound but there was an additional wheezing sound (+/+) during expiration. In the supporting examination, the laboratory results showed normal, whereas on chest X-ray examination, increased bronchovascular markings were found, suggesting a picture of bronchitis.

The therapy given to patients while hospitalized was in the form of nasal cannula oxygen 2 liters per minute, injection of omeprazole 40 mg every 12 hours, injection of ceftriaxone 2 grams every 24 hours, injection of 62.5 mg of metylprednisolone every 24 hours, 1 capsule of acetylcysteine every 8 hours, and paracetamol tablets every 8 hours if you have a fever, and nebulize Salbutamol – Ipratropium Bromide – Budesonide. During treatment at the hospital, the patient's condition improved, so the patient was allowed to be outpatient and given Formoterol – Budesonide inhalation therapy twice a day, one puff.

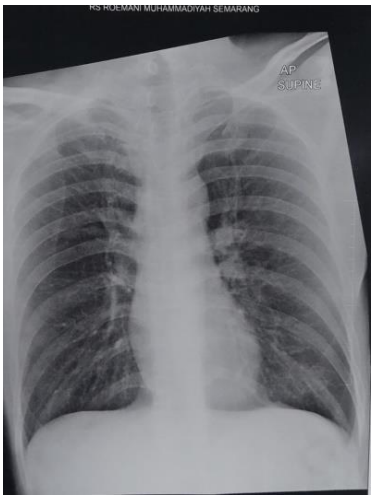


*Figure 1. Thorax X-ray Mr. P*

**Discussion**

The diagnosis of bronchial asthma in this patient was established from anamnesis, physical examination, and supporting examinations. In the anamnesis, the chief complaint was shortness of breath. Shortness of breath has been felt intermittently since 2 months ago, and has been getting worse since 1 day before entering the hospital when the patient was working. Shortness of breath accompanied by wheezing (+). The patient has a history of asthma (+) since he was a teenager, and his descendant of asthma from the patient's grandmother. The patient is a passive smoker, because he gets exposure to cigarette smoke from people around him. Previously, the patient was an active smoker (+), spent 3 packs of cigarettes a day for 12 years, but had stopped since 2007.

At the physical pulmo examination found that there is wheezing sounds during expiration (+/+).In the supporting examination, the laboratory results showed normal, whereas on chest X-ray examination, increased bronchovascular markings were found, suggesting a picture of bronchitis.

Asthma is a heterogeneous disease, generally characterized by chronic airway inflammation. Asthma symptoms include: wheezing, shortness of breath, chest tightness and coughing which can vary in time and intensity.(Global Initiative for Asthma, 2022) Asthma cannot be cured, but it can be controlled to reduce and prevent asthma attacks.(Centers for Disease Control and Prevention)

Factors that influence the incidence of bronchial asthma include host factors and environmental factors. Host factors include genetic factors, allergies (atopy), bronchial hyperreactivity, gender and race. While environmental factors include allergens, work environment sensitization, cigarette smoke

, air pollution, respiratory infections (viruses), diet, and socio-economic status. The factors that affect bronchial asthma will be different for each individual.(PDPI, 2003) Precipitating factors are factors that can cause an asthma attack. Some literature mentions the trigger factors of asthma in asthma patients are exposure to allergens, physical activity, cigarette smoke, weather, air pollution, respiratory tract infections, and psychological factors. (Dandan et al., 2022)

The goal of asthma treatment is to achieve good asthma control, that is, to minimize symptoms and the risk of exacerbations. The degree of asthma control is the degree to which asthma manifestations are observable in the patient, or have reduced or disappeared with treatment. Assessment of asthma control in terms of symptom control and risk of adverse outcomes. Poor symptom control is burdensome for the patient and increases the risk of exacerbations, but patients with good symptom control can still experience severe exacerbations. Asthma control assessment was carried out during the last four weeks by asking patients whether they experienced asthma symptoms more than twice a week, waking up because of asthma, using SABA class drugs more than twice a week, and any activity limitations due to asthma. (Global Initiative for Asthma, 2022)

Asthma management based on the Global Initiative for Asthma (GINA) in 2022 is divided into 3 types of treatment categories, namely controller, reliever and additional therapy for patients with severe asthma. Controller medications containing ICS are used to reduce airway inflammation, control symptoms, and reduce future risks such as exacerbations and related decline lung function. In patients with mild asthma, a controller combination can be given in the form of low-dose ICS-formoterol as needed, which is taken when symptoms occur and before exercise.(Global Initiative for Asthma, 2022)

Reliever medications aim to relieve symptoms, including during exacerbations. The reliever can be a low-dose ICS-formoterol as needed or a short-acting beta-agonist (SABA). ICS-formoterol is a recommended reliever, but do not use it if the ICS-LABA contain in asthma controller drugs is different.(Global Initiative for Asthma, 2022)

Consider giving additional drugs (add-ons) to patients with severe asthma if they have persistent asthma symptoms and/or exacerbations even though treatment has been optimized with a high-dose controller (usually high-dose ICS plus a long-acting beta-agonist/LABA) and treatment of modifiable risk factors. (Global Initiative for Asthma, 2022)

Someone with good asthma control has been achieved and maintained for 3 months, then it can be considered to reduce the dose to reach the optimal dose for controlling symptoms and exacerbations. (Global Initiative for Asthma, 2022; Lukito, 2023)

In patients with poor symptom control and/or exacerbations despite undergoing moderate or high dose ICS-LABA treatment, contribution factors and optimization of asthma treatment should be assessed. If the problem persists or the diagnosis is uncertain, refer to a specialist. (Global Initiative for Asthma, 2022; Lukito, 2023)

In this case report, the risk factors for developing asthma in patients are due to weather, exposure to cigarette smoke , and a hereditary history of asthma sufferers. Patients come with complaints of shortness of breath during the summer. Summer months are associated with higher concentrations of

many important pollutants, such as ground-level ozone, that are related to airway inflammation, asthma exacerbations, and other acute respiratory outcomes. (Soneja et al., 2016) Exposure to cigarette smoke can cause bronchoconstriction, airway edema, and airway hyperresponsiveness that can trigger asthma. In a study conducted by Embuai, it was found that people with asthma are very vulnerable and sensitive to smoke, be it cigarette smoke, household smoke, smoke from the surrounding environment, or vehicle exhaust. (Embuai, 2020) Exposure to passive smoke increase the risk of hospitalization and poor asthma control. (Global Initiative for Asthma, 2022) Having a family history of asthma is a risk factor for asthma, both parents and grandparents. (Valerio et al., 2010)

In the past month, the patient admits that asthma symptoms are felt almost every day, often wakes up at night, and there are limitations in doing activities when asthma relapses. Complaints of shortness of breath felt better after taking the fenoterol inhalation drug . Because 3 out of 4 asthma control assessment points were obtained, this indicates that the patient is not under control.

The therapy given to patients while hospitalized was in the form of nasal cannula oxygen 2 liters per minute, injection of omeprazole 40 mg every 12 hours, injection of ceftriaxone 2 grams every 24 hours, injection of 62.5 mg of metylprednisolone every 24 hours, 1 capsule of acetylcysteine every 8 hours, and paracetamol tablets every 8 hours if you have a fever, and nebulize Salbutamol – Ipratropium Bromide – Budesonide. During treatment at the hospital, the patient's condition improved, so the patient was allowed to be outpatient and given Formoterol – Budesonide inhalation therapy twice a day, one puff.

Asthma is a chronic inflammatory disease, so the treatment needs to be given anti-inflammatory. In this case, the patient was given corticosteroids in the form of methylprednisolone. Corticosteroids is effective in asthmatic patients because it can reduce inflammation in the airways thereby reducing edema and mucus secretion into the airways. Regular treatment using corticosteroids is very important, because irregular treatment will increase morbidity and mortality. (Natakusumawati et al., 2017)

In this case, the patient was given an antibiotic in the form of ceftriaxone. Giving antibiotics to asthmatic patients is actually not recommended because the evidence does not support the routine use of antibiotics in the treatment of acute exacerbations of asthma, unless there is strong evidence of lung infection (such as fever, purulent sputum, or pneumonia). (Global Initiative for Asthma, 2022) Patient is given antibiotics because there are symptoms of lung infection, such as fever, cough with phlegm, and radiological features of bronchitis.

The patient was given a salbutamol-ipratropium bromide-budesonide nebulize. The Global Initiative for Asthma (GINA) no longer recommends treating asthma with SABA alone in adults and adolescents. Previous studies have shown that with higher use of SABA, the risk of asthma exacerbations and death increases, including in patients treated with SABA alone. Patients who are given SABA drugs need to be given ICS to relieve symptoms. In adult patients, inhaled anticholinergic agents like ipratropium are potential alternatives to SABA for routine relief of asthma symptoms, but these agents have a slower onset of action than inhaled SABA. (Global Initiative for Asthma, 2022)

An exacerbation severe enough to require hospitalization may follow irritants or allergens exposure, viral respiratory infections, inadequate long-term medication, problems with adherence, and/or lack of a written asthma action plan.(Global Initiative for Asthma, 2022) So, someone with asthma should be given a controller medication to prevent exacerbation. But, in this case, the patient was not taking controller medication. Poor adherence with controller medications is a common precipitating factor for exacerbations. (Reddel et al., 2015)

## Conclusion

Asthma is a disease characterized by a history of respiratory symptoms such as wheezing, shortness of breath, chest tightness and coughing which can vary in time and intensity. Prevention of asthma can be done by avoiding existing risk factors, such as staying away from triggers of asthma events, such as exposure to dust and cigarette smoke. Proper treatment and education can make the disease have a good prognosis.

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