COPARISON OF THE EFFECTIVENESS OF SALBUTAMOL AND IPRATROPIUM DRUGS IN ADULT PATIENTS WITH BRONCHIAL ASTHMA AT BAUBAU CITY HOSPITAL

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A B S T R A C T

Asthma is a respiratory tract infection characterized by symptoms of chest tightness due to airway obstruction. According to WHO, there are around 300 million people in the world who suffer from asthma and it will continue to increase. The risk of developing asthma is caused by environmental and genetic factors. Asthma treatment includes pharmacological and non-pharmacological therapy. Among the many pharmacological therapies, the use of paracetamol is a drug that is often found in the community. This study used a descriptive survey model which took place at the Baubau City Hospital and was conducted in July 2023. Asthma management includes pharmacological and non-pharmacological approaches. Non-pharmacological approaches involve avoiding triggers, keeping the environment clean, and having regular check-ups with a doctor. Meanwhile, pharmacological approaches are carried out using drugs that function as relievers or controllers of the respiratory tract, either in the form of sprays or oral medications Data was taken using a questionnaire instrument and distributed to asthma patients who met the inclusion criteria. The population was 307 people with a total sample of 192 people. Data were analyzed using bivariate analysis. The results obtained were that all research samples (100%) were distributed in the frequency of bronchial asthma at the Baubau City Hospital.

INTRODUCTION

Asthma is a chronic inflammatory disorder of the respiratory tract characterized by symptoms such as wheezing, coughing, and tightness in the chest due to narrowing of the airways. These symptoms often occur at night when the air temperature is low, starting with coughing and a feeling of pressure in the chest, then followed by difficulty breathing and wheezing (Putri et al., 2022). Bronchial asthma is a chronic condition that is common in children and adults, both in developed and developing countries (Fitrah, 2023).

Based on the World Health Organization (WHO) report in 2020, there are around 300 million people worldwide living with asthma. This number is predicted to continue to increase to reach 400 million by 2025. The global prevalence of bronchial asthma is estimated at 7.2%, with details of 6% in adults and 10% in children (WHO, 2020).

According to data from the Ministry of Health in 2020, asthma is one of the fairly common diseases in Indonesia, with a prevalence reaching 4.5% of the population. It is estimated that the number of bronchial asthma sufferers in Indonesia reaches almost 14.5 million people, of which around 20% are adults (Kemenkes RI, 2020). Pharmaceutical services in providing the right medication are crucial for patient recovery (Mustiqawati et al., 2023).

The emergence of bronchial asthma is influenced by a combination of interactions between individual (host) and environmental factors. Individual factors include genetic predisposition that plays a role in increasing the risk of bronchial asthma, such as heredity, allergies (atopy), excessive sensitivity of the respiratory tract, gender, and ethnicity (Nursalam et al., 2017). The environment plays an important role in influencing individuals who are susceptible to bronchial asthma, both in triggering the development of the disease, worsening the condition, and causing the symptoms of bronchial asthma to persist. Contributing factors include exposure to allergens, workplace sensitization, cigarette smoke, air pollution, respiratory infections (such as viruses), diet, socio-economic conditions, and family size (Kasrin et al., 2023).

Asthma management includes pharmacological and non-pharmacological approaches. Non-pharmacological approaches involve avoiding triggers, keeping the environment clean, and having regular check-ups with a doctor. Meanwhile, pharmacological approaches are carried out using drugs that function as relievers or controllers of the respiratory tract, either in the form of sprays or oral medications (Fitrah, 2023).

Broadly speaking, asthma treatment is divided into two main types. First, drugs that are used regularly to manage asthma and prevent attacks, known as controller drugs. Second, drugs that are used when an asthma attack occurs to relieve acute symptoms, called relievers. Some examples of controller drugs include inhaled steroids such as fluticasone propionate and budesonide, antileukotrienes such as methylprednisolone, systemic corticosteroids such as prednisone, and long-acting beta-2 agonists such as formoterol and procaterol. Meanwhile, relievers include short-acting beta-2 agonists such as salbutamol, terbutaline, and fenoterol, anticholinergics such as ipratropium bromide, and methylxanthines such as theophylline and aminophylline (Lorensia & Kurnia Bahari, 2020).

There are two types of bronchodilator therapy commonly used to treat asthma attacks, namely inhaled salbutamol as a single therapy and a combination of salbutamol-ipratropium. Both of these therapies are included in the asthma treatment guidelines. For mild to moderate asthma, the main recommended treatment is a fast-acting beta-2 agonist given by inhalation, and inhaled salbutamol is one of the most frequently used therapies in hospitals in Indonesia (Putri et al., 2022).

Salbutamol is a drug used in the treatment of asthma. As part of the β2-adrenergic class, it is known to be the most effective bronchodilator available, acting as a "rescue drug" to help clear the airways during an asthma attack. Based on its nature of action, salbutamol is categorized as a short-acting β2-adrenergic. Drugs with a fast action provide an immediate response, but the duration of effect is relatively short, so they are generally used to treat acute asthma attacks (Kartina et al., 2020). Salbutamol works by relaxing the smooth muscles in the airways, thereby helping to relieve asthma symptoms (Pratiwi et al., 2021).

If the use of salbutamol alone does not show optimal results, the addition of ipratropium, an anticholinergic drug that functions to inhibit vagal reflexes by blocking the action of acetylcholine, can be considered. The combination of salbutamol with ipratropium bromide has been proven effective in treating moderate asthma attack (Lorensia & Kurnia Bahari, 2020).

Previous research by (Kasrin et al., 2023) entitled "Drug Classification Based on Asthma Drug Prescription in the Outpatient Installation of Dr. Agoesdjam Ketapang Hospital" revealed that the majority of outpatient asthma patients were women, with a total of 36 people (59%). The most dominant age group was 42-49 years, which recorded a total of 19 people (31%). Based on drug prescription data during the period from January to December 2020, the most frequently prescribed asthma drugs were Beta-2 Agonists (48%), with inhaler preparations (51%) and drug administration through inhalation (51%).

Study (Lorensia & Kurnia Bahari, 2020) entitled Cost-effectiveness analysis between salbutamol-ipratropium combination and salbutamol in asthma exacerbations showed that the use of salbutamol combination with ipratropium bromide was more cost-effective compared with salbutamol alone, based on the duration of hospitalization. However, in terms of symptom relief, there was a compromise, indicating that although the combination of salbutamol and ipratropium bromide was cheaper, it did not provide better results than salbutamol alone. In addition, there was no significant difference in cost, duration of treatment, or symptom improvement between the two therapies in patients experiencing asthma exacerbations.

Based on the previous description, it can be concluded that asthma requires comprehensive and specific treatment. If not treated properly, this condition can cause various complications, even life-threatening. Therefore, the author is interested in conducting a study entitled "Comparison of the Effectiveness of Salbutamol and Ipratropium in Adult Patients with Bronchial Asthma at Baubau City Hospital."

METHODOLOGY

This study used a descriptive survey design with a quantitative approach and a cross-sectional design, in which the independent variables (salbutamol and ipratropium drugs) and the dependent variable (bronchial asthma) were measured simultaneously. This study was conducted at the Baubau City Hospital in July 2023. The study population consisted of all adult patients suffering from bronchial asthma (Alfyanita et al., 2023) at the Baubau City Hospital in that month, totaling 370 people. The number of samples was determined using the Slovin formula, with a total sample of 192 people

Inclusion criteria include adult patients suffering from bronchial asthma at Baubau City Hospital, willing to be respondents, and have good communication skills. While exclusion criteria

include patients with hypertension, heart disease, kidney disease, gout, stroke, and other conditions, who are not willing to be respondents or mothers who cannot read.

The instrument used in this study was a questionnaire filled with a checklist for each question. The data collected consisted of primary and secondary data, while data analysis was carried out using bivariate analysis.

RESULTS AND DISCUSSION

After obtaining primary data obtained from the results of the questionnaire, namely 192 respondents of adult bronchial asthma patients at the Baubau City Hospital regarding the comparison of the effectiveness of salbutamol and ipratropium drugs in adult bronchial asthma patients at the Baubau City Hospital, the data obtained were processed and the research results were presented in the form of frequency distribution tables and narratives.

Respondent Characteristics

Age

Table. 1

Frequency distribution based on age of adult patients with bronchial asthma at Baubau City Hospital

Age	Frequency	Percentage %
Early Adulthood (26-35 Years)	89	46,4
Late Adulthood (36-45 Years)	103	53,6
Total	192	100,0

Source: Primary data analysis, 2023.

The results of the study showed that of the 192 respondents, most of them came from the late adult age group (36-45 years) which was recorded at 103 respondents (53.6%), followed by the early adult age group (26-35 years) with 89 respondents (46.4%). This finding indicates that the largest age group is 36-45 years. In this age range, individuals tend to be in a productive phase, busy with work, and often ignore their health. This can increase the risk of bronchial asthma recurrence in those who have a history of the disease. To prevent asthma attacks, it is important to adopt a healthy lifestyle and maintain the cleanliness of the surrounding environment (Tjitradinata et al., 2024).

Gender

Table. 2

Frequency distribution based on gender of adult patients with bronchial asthma at Baubau City Hospital

Gender	Frequency	Percentage %
Male	76	39,6
Female	116	60,4
Total	192	100,0

Source: Primary data analysis, 2023.

Based on the research findings, the data shows that the distribution of respondents by gender from a total of 192 people consisted of 116 women (60.4%) and 76 men (39.6%). The prevalence of asthma in women is higher than in men, this is due to hormonal fluctuations that occur during menstruation, pregnancy, and menopause, which can trigger asthma symptoms. The increased prevalence of asthma in women is also associated with the hormone estrogen, which can accelerate eosinophil degranulation and lead to asthma. High estrogen levels can also stimulate mast cell degranulation.

Hormonal changes that occur in adulthood play a role in the development of bronchial asthma, where hormonal factors and genetic susceptibility play a role in the prevalence changes that occur around puberty. Women also experience severe asthma more often, and in adulthood, they are more

susceptible to the effects of smoking, which increases the likelihood of asthma. Furthermore, univariate analysis in a study comparing the effectiveness of salbutamol and ipratropium drugs for adult patients with bronchial asthma at the Baubau City Hospital is explained as follows:

Bronchial Asthma

Table. 3
Frequency distribution based on bronchial asthma at Baubau City Hospital

Bronchial Asthma	Frequency	Percentage %
Bronchial asthma	192	100,0
Total	192	100,0

Source: Primary data analysis, 2023.

The results of the study revealed that all respondents involved, as many as 192 people, at the Baubau City Hospital experienced bronchial asthma, which means that 100% of the respondents were diagnosed with the condition. This finding is in line with research conducted by (Kasrin et al., 2023), entitled "Classification of Drugs Based on Asthma Drug Prescriptions in the Outpatient Installation of Dr. Agoesdjam Ketapang Regional Hospital", which also found that all respondents involved (61 people) had bronchial asthma.

Bronchial asthma is a long-term inflammatory condition of the respiratory tract that leads to increased sensitivity, with symptoms in the form of bronchial inflammation of varying severity. These symptoms often appear in the form of coughing, wheezing, shortness of breath, and chest pressure, especially at night or in the morning, caused by airway obstruction. Several factors that contribute to the risk of developing asthma include heredity, environmental conditions, and individual body factors (Tjitradinata et al., 2024).

The development of bronchial asthma is influenced by a combination of internal body factors (host) and external environmental factors. Internal factors include genetic tendencies that can increase the risk of asthma, such as allergies (atopy), airway hyperreactivity, gender, and race. Meanwhile, external factors play an important role in worsening conditions in individuals who already have a tendency towards asthma, and can trigger relapses or worsen symptoms, such as exposure to allergens, risky work environments, cigarette smoke, air pollution, viral infections of the respiratory tract, diet, socio-economic conditions, and family size.

Salbutamol and Ipratropium Medication

Table. 4
Frequency distribution based on salbutamol and ipratropium drugs in adult patients with bronchial asthma at Baubau City Hospital

Salbutamol and Ipratropium Medication	Frequency	Percentage %
Effective	66	34,4
Not effective	126	65,6
Total	192	100,0

Source: Primary data analysis, 2023.

Based on the results of the study, it was found that in the administration of salbutamol and ipratropium drugs, from a total of 192 respondents, the majority showed ineffective results, namely 126 respondents (65.6%), while 66 respondents (34.4%) showed effective results. This finding is consistent with research by (Nursalam et al., 2017) entitled Overview of Asthma Drug Use at Dr. Soesilo Slawi Regional Hospital, which involved 202 respondents, with the majority also showing ineffective results, namely 107 respondents (53.0%) and effective results in 95 respondents (47.0%).

Asthma management includes two therapeutic approaches, namely non-pharmacological and pharmacological. Non-pharmacological approaches involve efforts to avoid triggers, maintain environmental cleanliness, and have regular check-ups with a doctor. While pharmacological therapy consists of the use of drugs that can help relieve or control the airways, either through inhalation or orally.

If asthma is not treated promptly, this condition can become more difficult to treat because excessive mucus production can block the effectiveness of inhaled drugs. In addition, the inflammation that occurs is also at risk of worsening over time. To overcome this, administration of beta-2 agonists (such as salbutamol, salmeterol, albuterol) can be used, working by supporting the effects of muscarinic receptor antagonists (such as ipratropium bromide) in reducing inflammation, relaxing bronchial muscles, and reducing mucus production.

Beta-2 agonists are the mainstay of treatment for acute asthma attacks and are particularly effective as initial therapy for exercise-induced asthma. They act as bronchodilators by relaxing airway smooth muscle, and are recommended for symptomatic relief and as primary therapy during acute attacks. Salbutamol is well absorbed when taken orally and is metabolized in the liver and gut wall, but not in the lungs. The major metabolite is the inactive sulfate conjugate, and most salbutamol is excreted in the urine, either as metabolites or as the original form, with a small amount excreted in the feces.

Ipratropium bromide is an inhaled drug that is included in the category of hard drugs, so its use must consult a doctor first. If salbutamol alone is not effective enough, ipratropium which is an anticholinergic can help inhibit vagal reflexes by blocking the action of acetylcholine. The combination of salbutamol and ipratropium bromide is very useful in treating moderate asthma attacks.

Bivariate analysis aims to test the relationship between independent variables (salbutamol and ipratropium drugs) and dependent variables (bronchial asthma) using the Chi-Square statistical test conducted with the help of Statistical Program for Social Science (SPSS) software, which is designed for statistical data analysis and processing.

Table. 5

Results of the chi square statistical test comparing the effectiveness of salbutamol and ipratropium drugs in adult patients with bronchial asthma at Baubau City Hospital

Bronchial Asthma	Salbutamol and Ipratropium Medication				Amount		P Value
	Effective		Not effective		N	%	
	n	%	N	%			
Bronchial Asthma	66	34,4%	126	65,6%	192	100,0	0,000
Amount	66	34,4%	126	65,6%	192	100,0	

Source: Primary Data Analysis, 2023.

Table 5 shows that out of 192 respondents, there were 66 respondents (34.4%) who showed the effectiveness of salbutamol and ipratropium in the treatment of bronchial asthma, while 126 respondents (65.6%) did not show the same effect. The results of the Chi Square statistical test produced a p value = 0.000 (α <0.05), which indicated that the null hypothesis (Ho) was accepted and the alternative hypothesis (Ha) was rejected, thus indicating a difference in effectiveness between salbutamol and ipratropium in adult patients with bronchial asthma at the Baubau City Hospital.

CONCLUSION

Based on the results of the comparative analysis of the effectiveness of salbutamol and ipratropium in adult patients with bronchial asthma at the Baubau City Hospital, it can be concluded that all 192 respondents involved in this study (100%) suffered from bronchial asthma at the hospital.

Several limitations in this study include the limited scope only to adult patients at the Baubau City Hospital, the relatively short observation time, variations in patient conditions that can affect the results of the study, and the potential for bias if the study design is not strong enough. In addition, the limited number of samples, incomplete medical record data, and the absence of analysis of long-term effects are also major shortcomings in this study.

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