

# CHARACTERISTICS OF HOSPITALIZED ASTHMA PATIENTS IN SANGLAH HOSPITAL, DENPASAR, BALI

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**Abstract:** Asthma is a chronic inflammatory and allergic response. Until now, asthma is still a global health problem with around 339 million sufferers, mostly found in developing countries, such as Indonesia. The resulting morbidity is related to obstacles in carrying out work activities, which leads to decreased quality of life. This study aims to study the characteristics of hospitalized asthma patients at Sanglah Hospital Denpasar, Bali. The study was conducted with a descriptive method using cross-sectional studies. Samples were selected from participating based on inclusion and exclusion criteria. Data were analyzed using SPSS software version 22 to get asthma case characteristics based on age, sex, education level, occupation, marital status, smoking history, nutritional status, blood pressure, pulse rate, respiration rate, body temperature, oxygen saturation, leukocyte levels, hemoglobin levels, platelet levels, respiratory complaints, and the degree of asthma. Asthma cases in Sanglah General Hospital Denpasar, Bali from 2018 to 2019 were 35 people, the average age was 47 years, dominated by female sex (60.0%). Characteristics of dominant respondents have a bachelor's degree (28.6%), work as private employees (28.6%), are married (80.0%), have no history of smoking (68.8%) and have normal nutritional status (62.9%). Vital signs of respondents include mean systolic / diastolic blood pressure (119.71 / 76.29 mmHg), pulse 95 beats per minute, body temperature 36.860C, and O2 saturation of 94%. Respiration rate vital signs are classified as tachypnea (27 beats per minute). Lab examination of respondents showed that the mean levels of leukocytes were 12.94x10<sup>3</sup> μ / μL, Hb 13.3 g / L, and platelets of 260.3 x10<sup>3</sup> / mm<sup>3</sup>. Types of respiratory complaints that accompanied the most cases of asthma were shortness of breath (94.2%) with mostly a moderate degree of asthma (48.6%). Most cases of asthma occur in women with an average age of 47 years, undergraduate education, private employees, married status, no history of smoking, normal nutritional status, normal blood pressure and pulse, tachypneic breath rate, normal O2 saturation, classified leukocytes. infection, Hb and normal platelets with moderate asthma.

**Keywords:** Characteristics, Asthma, Hospitalized.

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## 1. INTRODUCTION

Asthma is a very complex airway disorder in terms of its clinical features, trigger factors, the course of the disease, and a very varied pattern of its mechanism of occurrence. Asthma has a classic characteristic, namely when you breathe a wheezing sound due to bronchoconstriction, swelling of the nasal mucosa and hypersecretion with a prolonged attack that lasts hours to a day. regarding widespread narrowing of the airway.<sup>1,2</sup> Asthma is a non-communicable disease (NCD) that is associated with an inflammatory response and is chronic in nature and can be associated with allergic / hypersensitivity reactions.

Until now, asthma is still one of the main global health problems. As many as 339 million people in the world are known to suffer from asthma and most of them are found in developing countries, one of which is Indonesia. Based on WHO data, the mortality rate caused by asthma is known to be 417,918 deaths.<sup>1</sup> Similar results, namely the high mortality and morbidity caused by asthma are also found by the asthma organization in the world, namely the Global Asthma Network (GAN), where as many as 334 million people are predicted to suffer asthma. This figure is expected to continue to

increase to 400 million people in 2025 and there are around 250 thousand deaths due to asthma, including cases in children.

Asthma in Indonesia is one of the top ten diseases that cause mortality and morbidity. The highest incidence rate of asthma from the results of the Riskesdas survey in 2013 reached 4.5% with the most cases found in women, namely 4.6% and men as much as 4.4% .4 On the other hand, the prevalence of asthma in Bali ranks 5th, which is 6.2% . suffer from asthma.<sup>5</sup>

Based on these data, it shows that asthma cases need serious attention and treatment, given the increasing number of cases. It is necessary to conduct research on the characteristics of hospitalized asthma patients at Sanglah Hospital Denpasar, Bali. This study is expected to be the basis for further research on the characteristics of hospitalized asthma patients at the Sanglah Central General Hospital, Denpasar, Bali.

## 2. MATERIALS AND METHODS

This study is a cross-sectional descriptive study to determine the characteristics of hospitalized asthma patients at Sanglah Hospital Denpasar, Bali from 2018 to 2019. This study uses secondary data in the form of hospitalized medical records at Sanglah Hospital Denpasar, Bali. The target population in this study were all asthmatic patients hospitalized in Sanglah Hospital Denpasar, Bali. The affordable population in this study were all hospitalized asthma patients registered at the Sanglah Hospital Medical Record Installation, Denpasar, Bali. Samples were taken from affordable populations based on inclusion criteria and exclusion criteria. The inclusion criteria were patients who had asthma cases registered in the Sanglah Hospital Denpasar Medical Record Installation, Bali from 2018 to 2019 who had data according to the variables studied. The exclusion criteria were asthma case data registered in the Sanglah Hospital Denpasar Medical Record Installation, Bali from 2018 to 2019 which were incomplete or missing. The sample collection in this study was carried out by total sampling.

The data that has been collected is carried out with univariate descriptive analysis using SPSS 22 software. The collected data will be processed and presented in the form of a diagrammatic table, or distribution chart of hospitalized asthma patients based on age, gender, level of education, occupation, marital status, history. smoking, nutritional status, blood pressure, pulse, respiration rate, body temperature, oxygen saturation, leucocyte levels, hemoglobin levels, platelet levels, complaints respiration, and the degree of asthma with explanation. This research has received ethical eligibility permission from the Research Ethics Commission (KEP) of the Faculty of Medicine, Udayana University with letter number 1579 / UN14.2.2.VII.14 / LP / 2019.

## 3. RESULTS

The total number of patients diagnosed with asthma until being hospitalized at the Sanglah Hospital Medical Record Installation, Denpasar, Bali for the period January 1, 2018 - November 30, 2019, based on the inclusion and exclusion criteria, was 35 people. The entire sample has different characteristics in each variable. Sampling data was recorded in the extraction form and then processed using SPSS ver. 22 to obtain the characteristics of hospitalized asthma cases based on age, gender, education level, occupation, marital status, smoking history, nutritional status, blood pressure, pulse, respiration rate, body temperature, oxygen saturation, leucocyte levels, hemoglobin levels, platelets, respiration complaints, and the degree of asthma. These characteristics will be presented in tabular form and given an explanation.

**Tabel 3.1: Respondent Characteristics**

Variable	N	Minimum	Maximum	average	Standard deviation
Long time treated	35	2	17	4.80	2.898
Age	35	20	87	46.74	16.048
Pulse	35	80	130	95.17	12.580
Respiratory rate	35	20	34	26.80	3.856
Body temperature	35	36	40	36.86	.888
O <sub>2</sub> saturation	35	85	99	93.61	3.958
Leukocyte levels	35	7.53	29.84	12.9443	4.25949
Hb levels	35	10.88	16.25	13.3574	1.37313
Platelet levels	35	128.8	331.0	260.306	48.4516
Systolic	35	100	150	119.71	13.170
Diastolic	35	60	100	76.29	9.727
Valid N (listwise)	35				

This study shows more than half of the respondents are > 45 years old (elderly). These results are in accordance with the results of previous studies that have been conducted. The highest elderly age group among hospitalized with asthma was also found in the study at dr. Soedarso Pontianak in 2014.<sup>6</sup> Most respondents suffer from asthma in the age range of respondents over 45 years because at that age asthma patients can suffer from asthma since childhood or adolescence which continues or occurs after a period of remission. In addition, this can also occur in older adults or more than 65 years. Asthmatic aging clinically consists of 2 groups, namely; groups who had asthma since childhood or adolescence and slow onset asthma. The incidence of asthma increases with age which is associated with an underdiagnosed phenomenon caused by decreased sensitivity to non-specific clinical symptoms and is often a confounding effect of comorbidities.<sup>7</sup>

As much as more than half of the respondents are female. Female sex occupies the highest position in hospitalized asthma patients at dr. Soedarso Pontianak in 2014.<sup>6</sup> This is because the diameter of the airway and lung function in men is greater than that of women. Airway resistance is inversely proportional to 4 times the diameter of the airway, so airway resistance is easy increases when the airway diameter is small and CO<sub>2</sub> retention in the blood can occur in women due to the small vessel diameter. Another factor is the presence of genetic polymorphisms in women that are not found in men, such as cyclooxygenase-2-765C. This genetic polymorphism increases the capacity of monocytes to produce prostaglandins, which increase inflammation of the airways. Apart from the influence of anatomy and genetics, hormones in women also have an important role in causing asthma. Progesterone increases IL-4 secretion and estrogen increases total IgE levels.<sup>8</sup>

Based on education level, a quarter of the respondents are undergraduate or university graduates. Different from the data from dr. Soedarso Pontianak in 2016 with high school education which occupies the highest position in hospitalized asthma patients. Meanwhile, undergraduate or tertiary education ranks second.<sup>9</sup> Education affects a person's attitude, actions, thoughts, where everyone who usually has primary, secondary or higher education each has different characteristics. Education also affects the mindset, the higher the education, the better the thinking and behavior. Various studies have shown that people with higher education tend to be more concerned about personal health, so that efforts to improve their health status are pursued by immediately seeking treatment at a health facility.<sup>10</sup>

More than a quarter of the respondents work as private employees. In contrast to respondents with the status of housewives or not working, who occupy the highest position in hospitalized asthma patients at dr. Soedarso Pontianak in 2016.<sup>9</sup> While private employees are in second place. Work is one of the supporting factors that influence a person in utilizing health services. Someone who works has a higher tendency to take advantage of health services than someone who does not work. One of the integrated insurance systems with a workplace makes it easier for employees to access health facilities. This trend is believed to encourage the awareness of working people to routinely check if there are problems

This study shows that about 4 out of 5 respondents on average are married. In line with previous research where the respondents with married status occupied the highest position in asthma patients at dr. R Sosodoro Djatikoesoemo Bojonegoro in 2008.<sup>11,12</sup> Problems that arise in marriage are sometimes unpredictable and these can arise anytime and anywhere. Problems that arise can range from small problems that can be resolved immediately to very complex problems that can cause stress and require energy to solve. When a person experiences stress, stress hormones such as cortisol will be produced excessively by the body so that it can cause immune changes and trigger various cofactors that can stimulate disease, one of which is asthma.

As much as more than half of the respondents have no history of smoking. Similar to the results of research conducted by Rai at Sanglah General Hospital Denpasar, which found the number of asthma patients with a history of smoking was only in the range of 7.8% in 2008.<sup>13,14</sup> If seen from the epidemiological theory, smoking is known to trigger asthma exacerbations. asthma sufferers not to come into contact with smoking activities. Sufficient awareness of asthmatics about the dangers of smoking and tightening regulations to regulate cigarette use in developing countries can be used as reasons for the low smoking history in asthmatics.<sup>14</sup>

The majority of respondents have a normal nutritional status. In line with the nutritional status is classified as normal and occupies the highest position in asthma patients at the hospital. Prof. Dr. R.D. Kandou Manado from January 2007 to December 2008.<sup>15</sup> From other studies it was found that nutritional status with obesity had a tendency to experience asthma in the 7-17 year age group. Obesity has also been reported in the general referral population of children with asthma. Based on research, nutritional status has no effect on the incidence of asthma. There is no data regarding the clear relationship between the incidence of asthma and normal nutritional status

The majority of respondents have normal vital signs (including blood pressure, pulse rate, body temperature and oxygen saturation) and a respiratory rate that is classified as tachypnoea. Similar results were also obtained, namely that the respiration rate was classified as tachypnea with other vital signs classified as normal, which was the dominant characteristic of asthma patients at the Lung Polyclinic at Pers Friendship Hospital Jakarta in 2011.<sup>16,17</sup> During an asthma attack, CO<sub>2</sub> is retained by increasing airway resistance during expiration, and causes respiratory acidosis. Then the respiratory system will compensate by increasing breathing or tachypnea. This compensation causes hyperventilation and can reduce CO<sub>2</sub> levels in the blood.<sup>17</sup>

The results of this study showed that more than 85% of the respondents had a normal laboratory blood check status (including hemoglobin and platelet levels) and high levels of leukocytes. These results indicate that there is agreement with the results of previous studies that have been conducted. High levels of leukocytes with other laboratory examinations classified as normal were the dominant characteristics of asthma patients in the Lung Polyclinic at Persahabatan Hospital, Jakarta in 2011.<sup>17</sup> During an asthma attack, both immunologic and non-immunological stimuli stimulate beta cells to form IgE with the help of T-helper cells. IgE will be bound by mastocytes through receptors in the airway. If the body is re-exposed to the same antigen, the antigen will bind to the IgE that is already on the surface of the mastocytes and stimulate inflammatory mediators such as histamine and eosinophils (a type of leukocyte).<sup>17</sup>

### **Characteristics of Respiratory Complaints**

The results of this study indicate that shortness of breath is the most common respiratory complaint found in asthma patients at Sanglah General Hospital with a percentage of almost 95%. Followed in second place with wheezing with a percentage of up to 63%. These results indicate that there is agreement with the results of previous studies that have been conducted. Types of respiratory complaints in the form of shortness of breath and wheezing were the two dominant characteristics of asthma patients at the Lung Clinic of Persahabatan Hospital, Jakarta in 2011.<sup>17</sup> During an asthma attack, capillary permeability or bronchial edema increases. This results in excessive smooth muscle contraction via direct mechanisms or sympathetic innervation (Nervus X). Excessive smooth muscle contraction results in airway hyperresponsiveness manifesting as shortness of breath and wheezing sounds. Both manifestations of respiratory complaints indicate impaired gas exchange associated with bronchospasm, mucosal edema, and increased secretion production.

### **Characteristics of Degree of Asthma**

Asthma classification based on the frequency of attacks can be assessed based on the severity of the attacks. The Global Initiative for Asthma (GINA) divides the degree of asthma attacks based on clinical symptoms and signs, lung function tests, and laboratory tests. The degree of attack determines the therapy to be applied.<sup>18</sup> The results can be seen further in table 5.2

**Table 3.2: Characteristics of Degree of Asthma**

<b>Degree of Asthma</b>	<b>Frequency</b>	<b>Percentage (%)</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
Mild	9	25.7	25.7	25.7
Moderate	17	48.6	48.6	74.3
Severe	9	25.7	25.7	100.0
Total	35	100.0	100.0	

This study shows that moderate degree of asthma is the most common degree of asthma found in asthma patients at Sanglah General Hospital. According to research conducted by Pratama et al., The results of their research at the Friendship Hospital stated that moderate asthma patients suffered more than other asthma patients. The number of asthmatic patients who are being treated at the Friendship Hospital is probably due to the lack of control of asthma in asthma patients at home.<sup>19</sup>

## **4. CONCLUSION**

Hospitalized asthma cases at Sanglah Hospital Denpasar Bali in 2018 to 2019 occurred mostly at the age of > 45 years, the most occurred in the female sex, undergraduate education who worked as private employees. Respondents are generally married. Most cases of asthma occurred in respondents who did not have a history of smoking, normal nutritional status, normal blood pressure, normal pulse rate, with the majority having a tachypneic respiration rate condition. Asthma cases at Sanglah General Hospital Denpasar, Bali from 2018 to 2019 also occurred in respondents who had normal body temperature, normal O<sub>2</sub> saturation, with leukocyte levels classified as infection, hemoglobin levels classified as normal / not anemia, normal platelet levels. The most common complaint is shortness of breath in moderate degree.

## 5. REKOMENDATION

Further research is needed regarding the relationship between variables and the addition of other characteristics related to triggers, previous history of asthma control, therapeutic data provided during MRS, and comorbidities needed to improve the quality of patient medical records and can be used as material for further research.

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