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Comparative Study of the Effectiveness of Airway Post General Anesthesia in Smoking and Non-Smoking Patients at Labuang Baji Regional Hospital, Makassar

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Abstract

The effectiveness of the airway after anesthesia, especially general anesthesia, is greatly influenced by the state of the pulmonary health system. Several respiratory system disorders such as airway obstruction, or conditions that can cause airway obstruction, airway infections, and other disorders that can inhibit gas exchange. This needs to be anticipated and handled properly so that respiratory emergencies do not occur. The research aims to determine the comparison of the effectiveness of the airway after general anesthesia in patients who smoke and who do not smoke at Labuang Baji Hospital, Makassar. This research is descriptive analytical research with a comparative study approach, namely a research design that compares similarities and differences as phenomena to find out what factors, or what situations, cause a particular event to occur. The research was conducted on 30 pre- and post-anesthesia patients at the Labuang Baji Regional Hospital, Makassar from 11 May to 11 June 2011. The results of the study showed that there was a difference in the effectiveness of the airway after general anesthesia in patients who smoked and did not smoke at the Labuang Baji Regional Hospital, Makassar. It is recommended for future researchers to examine other variables that have not been studied or use a better design in exploring the phenomenon.

Keywords: Smoking and Non-Smoking Habits, Airway Effectiveness, Post General Anesthesia

Introduction

Global problems are becoming increasingly common, especially the impact of air pollution. The consequences of air pollution can affect all aspects of life, both humans, flora, fauna and all materials in the environment around us. Especially in humans, air pollution has quite a large potential for disrupting respiratory tract function (Mukono, 2008).

Respiration (breathing) plays a role in maintaining cell metabolism so that adequate respiratory function is required. In order for cells to carry out metabolism so that they can produce energy, cells need an adequate supply of oxygen (O2) and nutrients into the body. Nutrition is obtained from food and fluid intake (Irman, 2008).

Respiration can be defined as a combination of mechanism activities that play a role in the process of supplying oxygen (O2) throughout the body and removing carbon dioxide (CO2) resulting from cell combustion. The function of respiration is to ensure the availability of oxygen (O2) for the continuity of metabolism of body cells and to continuously emit carbon dioxide (CO2) (Irman, 2008).

The respiratory tract from the nose to the bronchi is lined with a ciliated mucous membrane, the air that enters the nasal cavity is filtered, warmed and humidified. Coarse dust particles can be filtered by the hair in the nose, while fine dust particles will become

entangled in the mucosal lining. The movement of the cilia pushes the mucosal layer posteriorly into the nasal cavity and posteriorly towards the pharynx (Irman, 2008).

In general, the effect of air pollution on the respiratory tract can cause the movement of the nasal cilia to become slow and stiff or even stop so that they cannot clean the respiratory tract due to irritation by polluted materials. Mucus production will increase, causing narrowing of the respiratory tract and damage to bacteria-killing cells in the respiratory tract. The result of this will cause difficulty breathing so that foreign objects are attracted and other bacteria cannot be removed from the respiratory tract (Mukono, 2008).

The effectiveness of the airway after anesthesia, especially general anesthesia, is greatly influenced by the state of the pulmonary health system. Several respiratory system disorders such as airway obstruction, or conditions that can cause airway obstruction, airway infections, and other disorders that can inhibit gas exchange, emphysema and chronic bronchitis. This needs to be anticipated and handled properly so that respiratory emergencies do not occur (Sitepoe Mangku, 2006).

General anesthesia (general anesthesia) is also called general narcotics (NU). General anesthesia is a central relief of pain accompanied by reversible loss of consciousness. With general anesthesia, you will get a triad of anesthesia, namely: Hypnosis (sleep), analgesia (free from pain), muscle relaxation. Muscle relaxation is needed to reduce tension in muscle tone so that it will make surgery easier. Only ether has the anesthetic triad. Because modern anesthesia currently uses drugs other than ether, the anesthetic triad is obtained by combining various drugs. Hypnosis obtained from sedatives, inhalation anesthetics (halothane, enflurane, isoflurane, sevoflurane). Analgesia is obtained from N2O, narcotic analgesics, certain NSAIDs. Meanwhile, muscle relaxation is obtained from muscle relaxants (Muhaimin, 2000).

One of the factors that is believed to influence respiratory system disorders such as chronic bronchitis and pulmonary emphysema is smoking. According to the WHO Expert Committee On Smoking Control, cigarettes are the main cause of chronic bronchitis and pulmonary emphysema. Apart from that, there is also a close relationship between smoking and a decrease in forced expiratory volume in the first second (Sitepoe Mangku, 2006).

Tobacco is the most important cause of disability, suffering, premature death and preventable health problems. Tobacco is uniquely a dangerous and deadly consumer product even if used as intended by the manufacturer. Tobacco smoke contains thousands of chemicals that are known to be poisons that damage blood vessels, cause cancer and can damage all parts of the body. Tobacco causes addiction and not only hurts the smoker but also other people who are exposed to the smoke (Crofton, 2009).

Smoking is the main cause of chronic obstructive pulmonary disease. Within 1 to 2 years of smoking, a young smoker will develop inflammatory changes in the small airways, although lung function measurements of these changes cannot predict the occurrence of chronic airway obstruction. After 20 years of smoking, pathophysiological changes occur in the lungs in proportion to the intensity and duration of smoking. Chronic inflammation and narrowing of the small airways and enzymatic digestion of the alveolar walls and pulmonary emphysema cause a reduction in expiratory air flow resulting in clinical symptoms of obstructed breathing in 15% of smokers. A young smoker who experiences changes in the small respiratory tract will return to normal after stopping smoking for 1 to 2 years (Sudoyo, et, al, 2009).

The diseases most often caused by smoking are stroke, cataracts, mouth/throat cancer, lung infections, COPD, heart attacks, pancreatic cancer, aortic aneurysms, kidney cancer, cervical cancer, peripheral vascular disease (Crofton, 2009).

Things that can disrupt the integrity of the mucosal layer and the integrity of the cilia are cigarette smoke (Alsaggaf, 2006). About 47% of men and 12% of women smoke. Although smoking rates in high-income countries are now decreasing, the current global trend is that the number of smokers is expected to increase from 1.1 billion to 1.6 billion in 2025, (Crofton, 2009).

According to statistical data from the World Health Organization WHO, in 2008 there were 1.3 billion smokers worldwide. Tobacco can cause around 8.8% of deaths (4.9 million) and around 4.1% of diseases (59.1 million) worldwide. If this trend does not reverse, these figures will increase to 10 million deaths per year starting in 2020, or as early as 2030, with 70 percent of deaths occurring in developing countries, (WHO, 2008).

Based on observations, the World Health Organization (WHO) estimates that by 2020 diseases related to tobacco/smoking will become the biggest major health problem and cause 8.4 million deaths every year. It is estimated that half of these deaths will occur in Asia due to the high increase in tobacco use in Asia (South Sulawesi Health Office, 2007).

Indonesia ranks 3rd after China and India as the largest smoker in the world. In Indonesia there are 65 million smokers or 28% per population (225 billion cigarettes / year). The smoking statistics among children and teenagers are men, 24.1% of male children/teenagers, women, 4.0% of children/teenagers or 13.5% of Indonesian children/teenagers. The smoking statistics among adults are 63% of adult men, 4.5% of women or 34% of adult smokers. If you combine smokers among children + teenagers + adults, the number of smokers in Indonesia is around 27.6%. This means that for every 4 Indonesians, there is a smoker, this percentage figure is much greater than in America today, which is only around 19% (Muhaimin, 2000).

In Asia, the World Health Organization (WHO) stated that Indonesia ranks third in the number of smokers, reaching 146,860,000 people. However, until now Indonesia does not have legislation to prohibit children from smoking. Due to the absence of strict regulations, in research in four cities, namely Bandung, Padang, Yogyakarta and Malang in 2004, the prevalence of smokers aged 5-9 years increased drastically from 0.6% (1995) to 2.8% (2004) , (Damar, 2008).

The highest increase in smoking prevalence was in the 15-19 year age interval from 13.7% to 24.2% or an increase of 77% from 1995. According to a global survey of tobacco among teenagers in 1,490 junior high school students in Jakarta in 1999, there were 46.7 % of students have ever smoked and 19% of them tried before the age of 10 years, (Damar, 2008).

Based on research and surveys from the South Sulawesi Healthy Heart Foundation in 2008, 65% of teenagers in South Sulawesi were smokers. South Sulawesi Governor Syahrul Yasin Limpo added that only seven percent of teenagers in this area have good enough fitness. One of the causes is the large influence of smoking on teenagers (South Sulawesi Health Office, 2009).

If all this time the health threats and losses caused by smoking have not been able to make someone stop smoking, how about explaining all the benefits that can be obtained if you don't smoke. The following are the benefits if you don't smoke cigarettes.

As quoted from Health, researchers from Peninsula Medical School, England stated that there are many benefits that you will get if you don't smoke, including: You can save, you don't need to spend more money to buy cigarettes and you can buy other things you want. You will inhale less bacteria. Smoking cigarettes is the same as inhaling bacteria that can make you sick. You can be smarter because you avoid addiction to cigarette chemicals that can damage the brain. You will have a better lovemaking style and sexual ability because the blood flow and circulation are better and cleaner. You will sleep more soundly and better because nicotine is a substance that can interfere with hormone production (Dian, 2010).

At the Labuang Baji Makassar District Hospital from 2008 to 2010 there were 1620 post-operative patients recorded, especially in the Baji Kamase II treatment room. With the basic assumption that the patient received general anesthesia before undergoing surgery and became the initial reference for continuing this research, (Data on post-operative patients in the Baji Kamase II room Labuang Baji Makassar, 2011).

Based on all the problems described above, it is necessary to investigate how far the effectiveness of the airway after general anesthesia differs between patients who smoke and who do not smoke so that a concept for treatment and prevention can be formulated. The objective of the research to obtain an overview of the differences in airway effectiveness after general anesthesia in patients who smoke and who do not smoke.

Methods

This research uses a descriptive analytical research design with a comparative study approach. A comparative study is a research design that compares the similarities and differences of phenomena to identify the factors or situations that cause a particular event. This approach involves collecting facts about the factors that cause a symptom and comparing them with other situations or comparing symptoms and the factors that influence them from two or more sample groups. This study aims to provide an overview of the significance level of differences in airway effectiveness after general anesthesia between patients who smoke and who do not smoke. The population of this study included all surgical patients who received general anesthesia during sampling at Labuang Baji Hospital, Makassar, with a total population of 43 people. The sampling method used is accidental sampling, where samples are taken from respondents or cases that happen to exist. The number of samples planned in this research is around 30 people, in accordance with the sampling formula quoted from Zainuddin (1998) by Wasis (2008).

With this study design, it is hoped that researchers will be able to identify significant differences in airway effectiveness post general anesthesia between smoking and non-smoking patients, contributing to our understanding of the factors that influence these outcomes in the context of surgical patient health.

$$\mathrm{n} = \frac{N}{1 + N(d)^2}$$

$$\mathrm{n} = \frac{43}{1 + 43\,(0{,}1)^2}$$

$$n = \frac{43}{1 + 43\,(0{,}01)}$$

n = 30

This research uses inclusion criteria to select research subjects who are part of the target population and are affordable. These inclusion criteria were based on respiratory problems believed to be related to smoking habits, such as chronic bronchitis and pulmonary emphysema. On the other hand, exclusion criteria are used to eliminate subjects who meet the inclusion criteria but have lung diseases that are not directly related to smoking habits, such as asthma, pulmonary tuberculosis, lung abscesses, lung infections, and groups of patients with occupational lung diseases.

Data collection was carried out through an approach to the person in charge of the anesthesia department and the client's consent as a respondent. Data was collected using questionnaires and observations of post-general anesthesia patients who met the inclusion criteria. The data processing process involves editing to check the completeness of the questionnaire, coding categorical data, tabulation using narratives, frequency distribution tables, and graphs. Data analysis was carried out using the Chi Square statistical test to determine the significance of differences in airway effectiveness after general anesthesia between patients who smoke and who do not smoke, with a significance level of α: 0.05.

The research was carried out at Labuang Baji Regional Hospital, Makassar during the period 11 May - 11 June 2011. Research ethics were emphasized by providing an explanation of the aims and objectives of the research to respondents, obtaining informed consent, maintaining respondent anonymity by providing codes without including names, and ensuring confidentiality of respondent information for the benefit of preparation of the thesis.

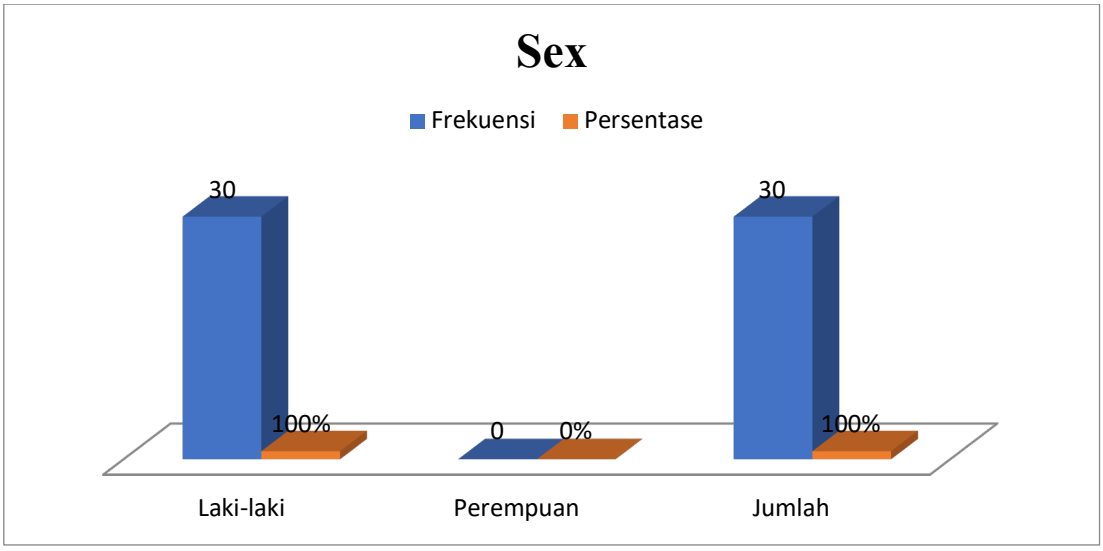
Results and Discussion

This research was carried out at the Labuang Baji Regional Hospital, Makassar from 11 May - 11 June 2011. Samples were drawn from the research population using accidental sampling. Respondents in this study had two criteria, namely inclusion and exclusion. Based on the results of filling out the questionnaire that was carried out, 30 samples were obtained that met the requirements to be included in data processing and analysis. The measuring instruments used are questionnaires and observation/observation sheets which are adjusted to the specific research objectives to be achieved.

Table 1. Frequency Distribution of Respondents Based on Gender in Pre-Anesthesia Patients at Labuang Baji Regional Hospital, Makassar

Gender	Frequency	Percentage
Man	30	100
Woman	0	0
Amount	30	100

Source: Primary Data

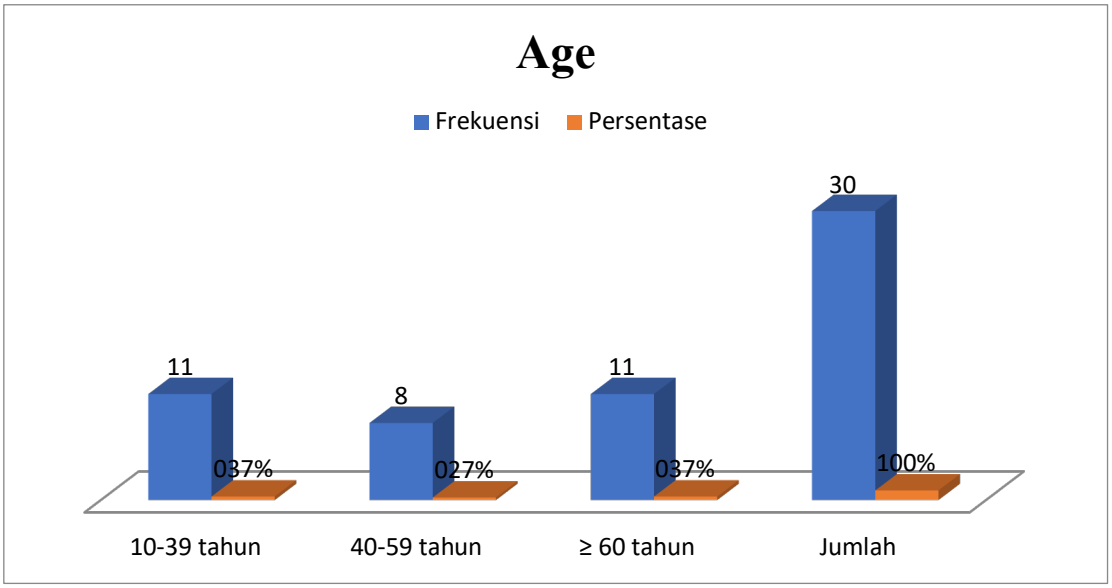


The characteristics of the respondents in this study can be described as follows: all 30 respondents were men (100%). Complete data can be seen in table 1.

Table 2. Frequency Distribution of Respondents Based on Age in Pre-Anesthesia Patients at Labuang Baji Regional Hospital, Makassar

Respondent's Age	Frequency	Percentage
10-39 years	11	36,7%
40-59 years old	8	26,7%
≥ 60 years old	11	36,7%
Amount	30	100%

Source: Primary Data

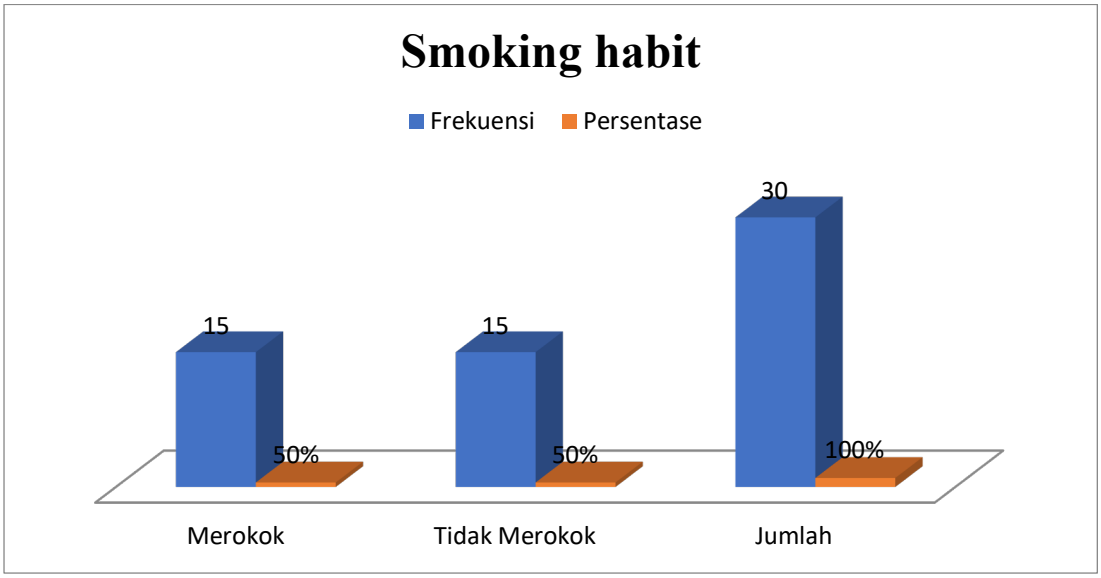


The characteristics of respondents based on age can be seen in table 2. Consisting of the age group 10-39 years as many as 11 people (36.7%), 40-59 years as many as 8 people (26.7%), ≥ 60 years as many as 11 people (36 .7%). Complete data can be seen in table 2.

Table 3. Frequency Distribution of Respondents Based on Smoking Habit Status in Pre-Anesthesia Patients at Labuang Baji Regional Hospital, Makassar

Smoking Habit Status	Frequency	Percentage
Smoke	15	50
Do not smoke	15	50
Amount	30	100%

Source: Primary Data

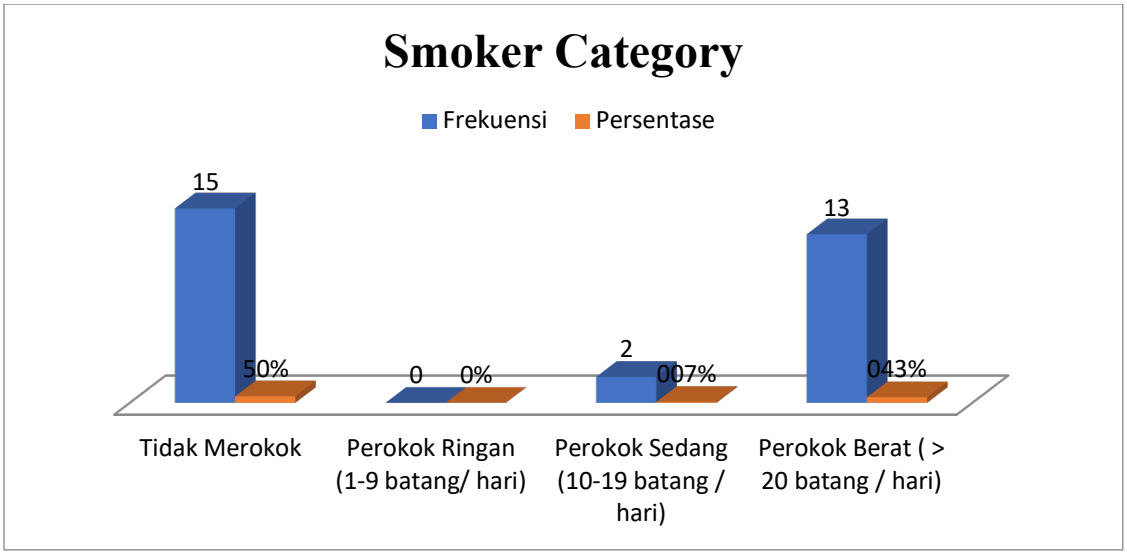


Characteristics of respondents based on smoking habit status, there were 15 respondents who smoked (50%) and 15 respondents who did not smoke (50%). Complete data can be seen in table 3.

Table 4. Frequency Distribution of Respondents Based on Smoker Category in Pre-Anesthesia Patients at Labuang Baji Regional Hospital, Makassar

Smoker Category	Frequency	Percentage
Do not smoke	15	50
Light Smoker (1-9 cigarettes/day)	0	0
Moderate Smoker (10-19 cigarettes/day)	2	6,7
Heavy Smoker (> 20 cigarettes / day)	13	43,3
Amount	30	100

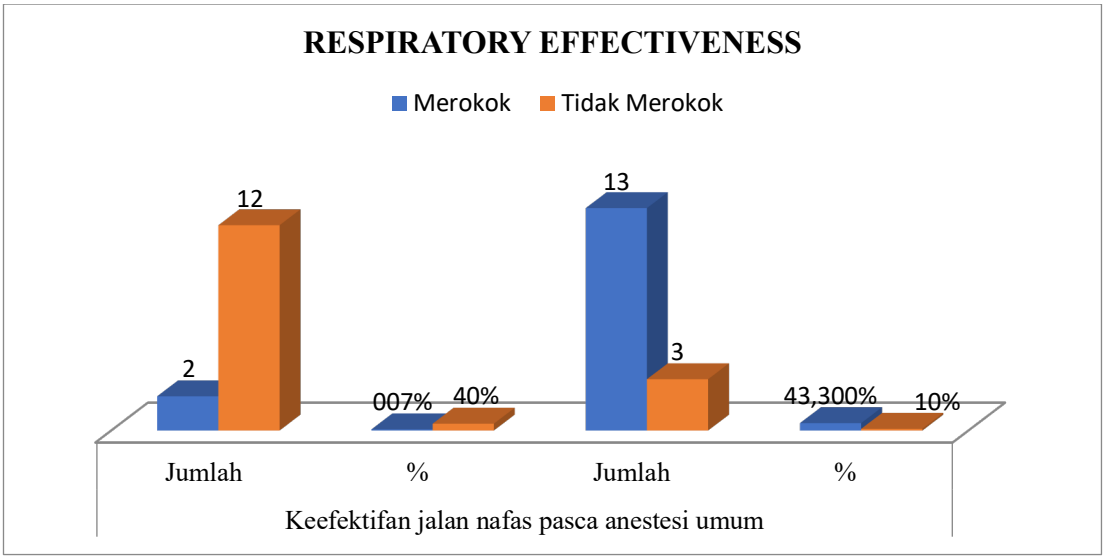
Source: Primary Data



Characteristics of respondents based on smoker category, namely: of the 30 total respondents, there were 15 respondents who did not smoke (50%), 2 respondents were moderate smokers (6.7%), 13 respondents were heavy smokers (43.3%). Complete results can be seen in table 4.

Table 5. Comparative analysis of airway effectiveness after general anesthesia in smoking and non-smoking patients at Labuang Baji Hospital, Makassar

Smoking Need	Effectiveness of Airway Post General Anesthesia				Total	%	*P*
	Effective		Ineffective				
	Total	%	Total	%			
Smoking	2	6,7	13	43,3	15	50,0	**0,000**
Not Smoking	12	40,0	3	10,0	15	50,0	
Total	**14**		**16**		**30**	**100,0**	



Characteristics of respondents based on airway effectiveness, namely: of 15 samples (50%) with smoking habits, 13 samples (43.3%) had an ineffective airway after general anesthesia

and 2 samples (6.7%) had an effective airway. . Of the 15 samples (50%) with a non-smoking habit, 12 samples (40%) had an effective airway and 3 samples (10%) had an ineffective airway after general anesthesia.

Based on the cross tabulation of the two variables, using the Chi Square test, the p value: 0.000 is smaller than α: 0.05. So it can be concluded that there is a difference in the effectiveness of the airway after general anesthesia between patients who smoke and who do not smoke.

Discussion of the differences in the effectiveness of the airway after general anesthesia in patients who smoke and who do not smoke.

Based on the results of this study, it was found that there was a difference in the effectiveness of the airway after general anesthesia in patients who smoked and who did not smoke. This is based on the results of the chi square statistical test, obtained p value: 0.000 < α: 0.05.

And it is confirmed from table 5 which shows that of the 15 (50%) samples who smoked, 13 (43.3%) had an ineffective airway after general anesthesia and 2 (6.7%) samples had an effective airway. Meanwhile, of the 15 (50%) samples who did not smoke, 12 (40%) had an effective airway after general anesthesia and 3 (10%) samples had an ineffective airway after general anesthesia.

This shows the fact that patients who have a smoking habit tend to have poor or ineffective airway effectiveness after general anesthesia compared to patients who do not have a smoking habit who tend to have better or less effective airway effectiveness after general anesthesia.

However, based on filling out the questionnaire and observations, it was found that 2 samples (6.7%) had an effective airway after general anesthesia and had a moderate smoking habit of 10-19 cigarettes per day, and the duration of consuming cigarettes was around 7-9 months. . Based on the theory of Anderson (1983), quoted by Mukono (2008) that "the longer the period of exposure to pollutants, the greater the risk of suffering from respiratory disorders and disorders".

So the researchers assumed that 2 samples (6.7%) with moderate smoking habits with a total of 10-19 cigarettes per day had an effective airway because these samples were not or had not been exposed to pollutants (cigarettes) for a relatively long time, so the effects of respiratory disorders have not been seen maximally and comprehensively in accordance with the theory put forward by Anderson.

Then, based on filling in the questionnaire and observations, it was found that 3 samples (10%) had an ineffective airway after general anesthesia and did not have a smoking habit. Based on the theory quoted by Imran Lubis (2009) that "smoking is one of the causes of respiratory problems and there are other variables including the effects of air pollution such as exhaust fumes, kitchen fumes, industrial factory exhaust fumes and so on". Based on the theory of Kumar (1987) quoted by Mukoko (2008), air pollution is the presence of pollutants in the atmosphere which, in certain concentrations, will disrupt the dynamic balance of the atmosphere and have an effect on humans and the environment."

Based on the theory of Chambers and Masters (1991) quoted by Mukono (2008) that "what is meant by air pollution is the addition of physical or chemical substances or substrates into the normal air environment that reach a certain amount, so that they can be detected by humans and can have an effect on humans, animals, vegetation, and materials".

So the researchers assumed that 3 samples (10%) with non-smoking habits had an ineffective airway caused by other variables that could cause respiratory problems such as the effects of air pollution in accordance with the theory put forward by Kumar and Cambers.

This situation can of course endanger patients because cigarettes contain many ingredients that are dangerous to health. In accordance with the opinion of experts, cigarettes contain approximately 4000 elements, and at least 200 of them are considered dangerous for health. The main toxins in cigarettes are tar, nicotine and carbon monoxide. These chemical compounds not only threaten the health of people who smoke cigarettes (active smokers) but are also very dangerous for people who are exposed to cigarette smoke (passive smokers) (Saiti, A, 2009).

According to Slide Share Zeitgeist, 2009, tobacco can paralyze the cleansing ability of the lungs, the fine hairs of the cilia which are coated with mucus to catch dust/dirt particles will be paralyzed due to substances: formaldehyde, hydrogen cinide, nitrogen dioxide, ammonia contained in cigarette smoke , (Slide Share Zeitgeist, 2009).

It is not only the person who smokes who is harmed who is harmed, but also other people who inhale the cigarette smoke, because it has been added with CO2 left over from burning O2. A cigarette smoker is at risk of experiencing 14 times lung, mouth and throat cancer, 4 times esophageal cancer, 2 times bladder cancer and 2 heart attacks. Apart from causing various diseases, smoking also increases the fatal risk for people suffering from pneumonia, heart problems and high blood pressure (Anna, 2009).

Apart from being toxic to nervous tissue, the chemicals from cigarettes increase blood pressure, cause coronary heart disease, and also cause various lung diseases. Pathologically, the gas phase of cigarettes is associated with hyperplasia of the mucus glands, causing acute and chronic bronchitis and even pulmonary emphysema (Sitepoe, 2006).

Providing anesthesia, especially general anesthesia to patients who smoke, has significant risks related to the effectiveness of the airway in relation to mucus production, coughing, bronchospasm and shortness of breath due to inflammation of the airways (Sitepoe, 2006).

Post general anesthesia is a stage that often causes serious problems and if not handled properly can cause death. Complications that occur after anesthesia are also very complex. With today's modern anesthetic techniques, general post-anesthesia complications can be reduced, but it is very unwise to assume that these complications will not occur. Complications of anesthesia that can occur are vomiting, thromboembolism, pulmonary complications, mechanical trauma, slow toxic effects of anesthetics, (Sitepoe, 2006).

Conclusion

There are more patients who have an ineffective airway than an effective airway after general anesthesia at Labuang Baji Hospital, Makassar. There are the same number of patients who smoke and who do not smoke after general anesthesia at Labuang Baji Hospital, Makassar. There is a difference in the effectiveness of the airway after general anesthesia in patients who smoke and who do not smoke. This is confirmed by the significance value p value = 0.000 which is smaller than $\alpha = 0.05$.

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