Health Frontiers
A Multidisciplinary Journal for Health Professionals
TARQABIN NUSANTARA GROUP
Health Frontiers: A Multidisciplinary Journal for Health Professionals, Vol 2 Issue 1 2024 E-ISSN : 3024-9740

Relationship Between Anesthesia And Respiratory Recovery Non Smoking Post Operative Patient In The Recovery Room Ngudi Waluyo Wlingi

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ABSTRACT

Impaired gas exchange due to decreased lung function can inhibit the process of eliminating inhaled anesthetic substances through pulmonary exhalation. Smoking causes changes in the structure, function of the respiratory tract and lung parenchymal tissue, resulting in a decrease in lung physiology. This study aims to determine the relationship between postoperative respiratory recovery time and general anesthesia between smoking and non-smoking patients. The research design used is a comparative study with a cross sectional approach using purposive sampling techniques. Respondents totaled 30 people and were divided into 2 groups. Research analysis used the Mann-Whitney test with a=0.05. The average breathing recovery time for smokers is 2 minutes and 1 minute for non-smokers. Statistical test results showed that there was no difference in respiratory recovery time between smoking and non-smoking patients with p-value=0.550. Recommendations for future researchers to continue this research with more homogeneous respondents.

KEYWORDS

General Anesthesia, Respiratory Recovery Time, Smokers, Non-smokers

Received: 1 March 2024
Revised: 29 June 2024
Accepted: 30 June 2024

How to cite: *Ekawati, Naya et al. (2024). Relationship Between Anesthesia And Respiratory Recovery Non Smoking Post Operative Patient In The Recovery Room Ngudi Waluyo Wlingi. Heal Front A Multidiscip J Heal Prof. 2(1): 8-13.*

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INTRODUCTION

Surgery is an invasive procedure that involves opening and exposing a certain part of the body, starting with making an incision, then carrying out corrective action, and ending with closing and suturing the wound area (Sjamsuhidajat, 2017). This procedure is carried out on patients with difficult body conditions or body conditions that cannot be cured using simple medicines (Potter & Perry, 2006). The aim of surgery is to save lives, remove or repair body parts, improve body functions, and improve health (Smeltzer & Bare, 2002).

Recovery of a patient's breathing after general anesthesia is a condition where the patient is able to breathe deeply and cough freely, which is obtained from the results of evaluating the depth of breathing, the nature of breathing, and the patient's coughing ability. Respiratory recovery depends on the adequacy of the respiratory system after anesthesia. During surgery, general anesthesia suppresses breathing and decreases the body's response to CO2. As a result, there can be an increase in the respiratory rate due to hypercapnia or hypercarbia (increased PaCO2 in arterial blood) resulting in deep and rapid breathing (hyperventilation), hypocapnea or hypocarbia can also occur (decrease in PaCO2 in arterial blood) which causes slow and shallow breathing. Apart from that, general anesthesia also affects the ventilation and perfusion (V/Q) ratio of the lungs, causing a decrease in FRC (Functional Residual Capacity) and lung compliance, a decrease in pulmonary vasoconstriction activity which results in a decrease in PaO2 levels and an increase in arterial- alveolar PO2 levels, as well as a decrease CO levels are worsened by the use of PEEP (Positive-End Expiratory Pressure) during anesthesia (Mangku & Senapathi, 2010; Sjamsuhidajat, 2017; Nagelhout & Plaus, 2010; Smeltzer & Bare, 2002).

Clients who will undergo surgery must go through thorough preparation stages to reduce risks that could threaten their life safety (Sjamsuhidajat, 2010). In this phase, the nurse's role is to carry out pre-surgical assessments as optimally as possible before the surgical procedure is carried out. The assessment carried out includes nursing history, medical history, previous surgical history, client and family members' perception and understanding of surgery, drug history, allergies, smoking habits, alcohol consumption and drug abuse, family support, employment, pain assessment, emotional health , culture, physical examination, risk factors and diagnostic screening (Potter & Perry, 2006). One of the important things that needs to be studied in more depth before surgery and anesthesia is carried out is the client's smoking history.

There are several previous studies related to smoking habits. First, research by Leopold et al in 2009 showed that the length of cilia in healthy smokers decreased by 15% when compared to non-smokers when observed via endotracheal biopsy. Second, research by Maniata et al in 2016 showed that the average FEV1 (Forced Expiratory Volume in One Second) value of smokers was lower than that of non-smokers, where a decrease in FEV1 was a sign of decreased lung function. Third, research by Kotani et al in 2000 showed that

smokers have limited ability in pulmonary immune defense after anesthesia and surgery, characterized by a decrease in phagocytic and microbicidal activity due to reduced expression of proinflammatory cytokines. This illustrates that smokers have a higher risk of pulmonary complications after surgery with anesthesia than non-smoking patients.

Based on a preliminary study conducted by researchers on May 18 2022 in the Recovery Room at Ngudi Waluyo Wlingi Regional Hospital, it was found that the number of male patients who underwent surgery under general anesthesia in the last three months (February - April 2022) was 97 patients, divided into 62 patients with a history of smoking and 35 patients without a history of smoking. The problem found based on interviews with the head of the recovery room and several nurses in the recovery room was that most patients with a history of smoking had a longer average recovery time after anesthesia than patients without a history of smoking. Data from observations of recovery time for patients after general anesthesia in the recovery room shows that the average

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recovery time for patients with a history of smoking is 45 minutes, while the average recovery time for patients without a history of smoking is 37.5 minutes. The aim of this study was to analyze the relationship between anesthesia administration and respiratory recovery in non-smoking post-operative patients in the recovery room at Ngudi Waluyo Wlingi Regional Hospital.

MATERIALS AND METHODS

The type of research is a quasi experiment with a comparative study research design using a cross-sectional approach. This research was conducted on two groups, namely post-operative patients with general anesthesia, the smoker group and post-operative patients with general anesthesia, the non-smoker group. Smoking history was obtained when the patient was in the premedication room at Wlingi Blitar Regional Hospital. Meanwhile, respiratory recovery time was obtained through post-surgical observation of the patient, where each group was observed continuously every 15 minutes from the time the anesthesia was stopped until the patient achieved stable breathing, which was marked by achieving a score of 2 on the Alderete Score (respiratory) parameter. The population in this study were all post-operative patients with general anesthesia in the recovery room at Ngudi Waluyo Wlingi Regional Hospital, totaling 237 patients during the last 3 months of the period February- April 2022. In this study the sample used was 30 respondents who would be divided into 2 groups, namely 15 respondents from the smoker group and 15 respondents from the non-smoker group. Statistical tests use the Mann-Whitney Test.

RESULTS

The results of the univariate analysis of this study can be seen in the following table:

Table 1. Distribution Based on Average Bowel Sound Recovery Time

Intestinal noise recovery time (minutes)	Min	Max
Respondents given laxatives (minutes)	15	30
Respondents who were not given laxatives (minutes)	30	45

Table 1 shows that intestinal noise recovery time in patients given laxatives appeared faster on average at 15 minutes, while intestinal sound recovery time in patients not given laxatives appeared on average at 30 minutes.

Table 2. The effect of laxative drug administration on the recovery time of intestinal sound in postoperative patients under general anesthesia

Treatment	n	*Mean*	Difference	*P-value*	Conclusion
Intestinal noise recovery time is	15	10,20	10,60	0,000	*P-value* < 0.05

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given laxatives			which means H0 rejected accepted hypothesis
Recovery time is not given laxatives	15	20,80	

Based on table 2, it was found that of the 15 respondents who were given laxatives, the time to recover from intestinal sound was faster than the 15 respondents who were not given laxatives. The results of the effect analysis using the Mann Whitney test α value (0.05) obtained a P-Value *of* 0.000, which is < 0.05, which means that H0 is rejected, meaning that there is an effect of laxative administration on intestinal noise recovery time in postoperative patients under general anesthesia. Thus, if patients with preoperative are given laxative drugs, the recovery time of intestinal sound in postoperative will be faster.

DISCUSSION

Effect of post-operative respiratory recovery time with general anesthesia on non-smoking patients in the recovery room at Ngudi Waluyo Wlingi Regional Hospital

Most respondents achieved respiratory recovery time at 0 minutes, namely 13 respondents who were smokers and 14 respondents who were non- smokers. Meanwhile, the remainder achieved respiratory recovery in the 15th minute, namely 2 respondents who were smokers and 1 respondent who was not a smoker. Thus, it can be concluded that all non-smoking respondents had a respiratory recovery time within the normal range, namely 0-15 minutes after anesthesia. According to the researchers' analysis, this is caused by the type of cigarette and ASA status.

The first factor that influences respiratory recovery is the type of cigarette. In this study, almost the majority (73%) of the respondents were smokers, namely 11 respondents consumed filter type cigarettes. Filter cigarettes are cigarettes that have a cork at the base. The nicotine content in filter cigarettes is smaller than non-filter cigarettes. This is because there is a cork which functions to reduce the entry and exit of smoke from cigarettes (Octavian, Setyanda, Sulastri, & Lestari, 2015). This opinion is supported by the results of research by Susanna, Hartono, & Fauzan, (2003) regarding determining nicotine levels in cigarette smoke which states that the nicotine content in filtered cigarette smoke is smaller than non-filtered clove cigarettes, namely 4,567 compared to 4,721. Therefore, researchers assume that the bad effects of lung smoking can be minimized because most smokers consume filter cigarettes, so that smokers' lungs do not experience many changes, both anatomical and physiological. Thus, this situation can support smokers to have normal breathing recovery time.

The second factor that influences respiratory recovery time is ASA status. In this study, all respondents (100%) had ASA status I. Sjamsuhidajat (2017) said that ASA (American Society of Anesthesiologists) is a guideline that can be used to conclude the risk status of anesthesia in patients who will undergo surgery. In ASA group I, there are no organic, biochemical and psychiatric disorders. ASA I patients are patients who are healthy, normal, and do not have comorbidities. Based on this description, researchers assume that ASA status can influence the respiratory recovery time of patients after general

anesthesia. This is supported by the opinion of Mangku & Senapathi (2010) who say that one of the factors that influences a patient's recovery after surgery with general anesthesia is the patient's general condition.

Apart from the factors above, researchers are of the opinion that one of the reasons why all respondents had a breathing recovery time within the normal range was that the respondents

breathed spontaneously independently during the intraoperative phase. Hall (2011) says that during normal breathing air can very easily flow through the respiratory tract. During normal, calm breathing, all respiratory muscle contractions occur in the inspiratory phase and the expiratory phase is an almost entirely passive process due to the elastic recoil properties of the lungs and chest frame. Muttaqin (2014) and Sherwood (2012) say that elastic recoil is a reflection of how easily the lungs return to their original shape after the stretching process. This plays a role in returning the lungs to pre-inspiratory volume when the inspiratory muscles relax at the end of inspiration. This process relies on the elastic properties of the lungs and chest, where energy is still needed but the lungs can quickly return to their initial shape if the energy in the body is ineffective.

The respiratory phase involves a complex process and is related to many variables, one of which is lung compliance (Muttaqin, 2014; Sherwood, 2012). Compliance is a measure of how much change in lung volume occurs due to changes in the transmural pressure gradient (the force that stretches the lungs). A highly compliant lung expands more for a given increase in pressure difference than a less compliant lung. In other words, the lower the lung compliance the greater the transmural pressure gradient that must be created during inspiration to produce normal lung expansion. Conversely, a greater than normal transmural pressure gradient can be created simply by making the intra-alveolar pressure more subatmospheric than normal. This can be achieved by greater thoracic expansion through stronger contraction of the inspiratory muscles. Therefore, The smaller the lung compliance value, the greater the work that must be done to produce the same lung development (Muttaqin, 2014).

Based on this description, the researchers concluded that the condition of patients who breathe spontaneously independently in the intraoperative phase can maximize the recoil and compliance of their lungs. Both of these support the physiological ability of the lungs to breathe by supporting maximum ventilation processes. So the researchers concluded that the condition of patients breathing independently spontaneously in the intraoperative phase can support the recovery of normal breathing for both smokers and non-smokers.

CONCLUSIONS

From the research results, it was found that there was a relationship between the patient's non-smoking status and the recovery time for respiratory status. It is hoped that future research will be able to examine in more depth the smoking history of patients who will undergo surgery under general anesthesia so that nurses can provide appropriate interventions to avoid post-anesthesia complications.

Acknowledgement

Thanks To Poltekkes Kemenkes Malang

Funding Source

Funding by Poltekkes Kemenkes Malang

Conflict of Interest

No Conflict of Interest

Health Frontiers: A Multidisciplinary Journal for Health Professionals, Vol 2 Issue 1 2024 E-ISSN : 3024-9740

REFERENCES

Aji, A., Maulinda, L., Kimia, J. T., Teknik, F., Malikussaleh, U., Utama, K., … Rokok, P. (2015). Isolasi Nikotin Dari Putung Rokok Sebagai Insektisida. Jurnal Teknologi Kimia Unimal, 1(Mei), 100–120.

Amelia, R., Nasrul, E., & Basyar, M. (2016). Hubungan Derajat Merokok Berdasarkan Indeks Brinkman dengan Kadar Hemoglobin, 5(3), 619–624.

Arikunto, S. (2010). Prosedur Penelitian Suatu Pendekatan Praktek. Jakarta: PT Rineka Cipta.

Arvianto, Oktaliansah, E., & Surahman, E. (2017). Perbandingan antara Sevofluran dan Propofol Menggunakan Total Intravenous Anesthesia Target Controlled Infusion terhadap Waktu Pulih Sadar dan Pemulangan Pasien pada Ekstirpasi Fibroadenoma Payudara Arvianto,1, 5(1), 24–31.

Brunton, L., Blumenthal, D., Parker, K., & Buxton, I. (2010). Goodman & Gilman Manual Farmakologi dan Terapi. Jakarta: EGC.

Champe, P. C. (2013). Farmakologi Ulasan Bergambar. Jakarta: EGC.

Cohen, L., Manion, L., & Morrison, K. (2007). Research Methods In Education
(6th ed.). USA and Canada: Routledge.

Dinata, D. A., Fuadi, I., & Redjeki, I. S. (2015). Waktu Pulih Sadar pada Pasien Pediatrik yang Menjalani Anestesi Umum di Rumah Sakit Dr. Hasan Sadikin Bandung Defri. Jurnal Anestesi Perioperatif, 3(2), 100–108.

Faleiro, R. J., & Dch, H. (2006). Delayed recovery of consciousness after anaesthesia. Continuing Education in Anaesthesia, Critical Care & Pain, 6(3), 114–118. https://doi.org/10.1093/bjaceaccp/mkl020

Grady, S. R., Meinerz, N. M., Cao, J., Reynolds, A. M., Picciotto, M. R., Changeux, J., … Collins, A. C. (2001). Nicotinic agonists stimulate acetylcholine release from mouse interpeduncular nucleus : a function mediated by a different nAChR than dopamine release from striatum. Journal of Neurochemistry, 76, 258–268.

Gufran, M., Lalenoh, D., Kumaat, L., Skripsi, K., Kedokteran, F., Sam, U., … Clark, W. E. (2013). Perbandingan skor ramsay anestetika inhalasi isofulran dibanding sevofluran pada pasien pasca operasi abdomen 1. Jurnal E- Biomedik (EBM), 10, 748–754.

Hall, J. E. (2011). GUYTON AND HALL Textbook of Medical Physiology TWELFTH EDITION.

Hariyanto, T., Herawati, H., & Wahyuningsri. (2015). Hubungan Antara Konsumsi Rokok Dengan Lama Proses Penyembuhan Luka Operasi Elektif Steril Fase