IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 8, Issue 6 Ser. VII. (Nov - Dec .2019), PP 75-78
www.iosrjournals.org

Effects of Right Lateral Positioning on Hemodynamic in Patients with CHF in the Period of Circadian Cycle in Medan

Lilis Pujiati[1], Sutomo Kasiman[2], Ikhsanuddin Ahmad Harahap[3]
[1]*Faculty of Nursing, Universitas Sumatera Utara, Indonesia*
[2]*Faculty of Nursing, Universitas Sumatera Utara, Indonesia*
[3]*Faculty of Nursing, Universitas Sumatera Utara, Indonesia*
Corresponding Author: Lilis Pujiati

Abstract: *The effects of right lateral positioning have several mechanisms that cause a decrease in both systolic and diastolic blood pressure and slow down the heart rate so that it will reduce the workload of the heart in patients with congertive heart failure (CHF). Right lateral positioning also results in a smaller workload of respiratory function in CHF patients which will improve patient oxygenation. The purpose of this study was to identify the effect of giving Right lateral positioning on hemodynamic in patients with CHF in the period of circadian cycle. The research design is quasi-experimental. The research sample of 32 respondents taken by consecutive sampling technique. Hemodynamic measurements performed included systolic blood pressure (BP), diastolic BP, mean arterial pressure (MAP), heart rate (HR), respiratory rate (RR) and oxygen saturation, each measured 4 times. Bivariate analysis using paired t-test and Wilcoxon signed ranks test. The results showed that there were significant differences in the measurement of systolic BP, diastolic BP, MAP, HR, RR, and oxygen saturation between before giving intervention and after giving right lateral position intervention (p value = 0,000). Based on the results of the study it can be concluded that the administration of right lateral interventions most influential on hemodynamic CHF patients is after 30 minutes of giving the right lateral position. It is recommended that right lateral positioning can be used as one of the interventions in providing CHF nursing care in maintaining hemodynamic stability in CHF patients, especially grade II and III.*

Keywords: *Right Lateral Positioning, Hemodynamics, CHF, Circadian Cycle*

Date of Submission: 02-12-2019 Date of Acceptance: 18-12-2019

I. Introduction

Congestive heart failure (CHF) or so-called congestive heart failure is a progressive health problem in developed and developing countries including Indonesia with high mortality and morbidity (PERKI, 2015). Although outpatient treatment has been given optimally, CHF patients often require re-treatment in the hospital (readmission) (Fingar and Washington, 2015).

CHF is a leading cause of death in the United States. The death rate due to heart failure continues to increase from year to year, namely 287,000 deaths in 2015 to 309,000 deaths in 2014 despite optimal treatment (Mozaffarian et al., 2016).

In America, the prevalence of heart failure patients aged ≥ 20 years has increased from around 5.70 million (2009-2012) to 6.50 million (2011-2014). It is estimated that the number of people diagnosed with heart failure increased by 46% (> 8 million people) from 2012 to 2030. Based on data from the Atherosclerosis Risk in Communities Study (ARIC) in 2005-2013, 960,000 new cases of heart failure were found each year. Whereas in Asia, the prevalence of heart failure increased from 1.26% to 6.70% (Benjamin et al., 2017).

In Indonesia, heart failure is also still a problem because of the high rates of hospitalization and recurrence. The morbidity rate is 6% - 12% and the recurrence rate is 29% (Siswanto et al., 2015). Heart failure is one of twelve non-communicable diseases (PTM) whose prevalence is quite high in Indonesia (Ministry of Health, 2014). According to the 2013 Riskesdas results, the highest prevalence of heart failure based on doctor diagnoses and symptoms was in East Nusa Tenggara Province with 0.80% followed by Central Sulawesi province with 0.70%, while North Sumatra Province was estimated at 0.30%.

According to data from the Harapan Kita Heart Hospital Medical Record, heart failure has been ranked as the third major disease in the last 3 years. The number of heart failure patients in 2011 was 14,157, declining in 2012 to 8,145 patients but in 2013 it increased again to 10,204 (Jatung Harapan Kita Hospital Medical Record, 2013 in Rizka, Nurachmah and Gayatri, 2014). While the number of new CHF hospitalized patients in RSUP Adam Malik Medan has increased over the past four years, namely as many as 238 new patients in 2014, 248 new patients in 2015, 295 new patients in 2016, and 461 new patients in 2017 (RSUP Medical Record H Adama Malik Medan, 2018). Based on the initial survey conducted in the Integrated Heart Care Room of H

Adam Malik General Hospital in August 2017, the data showed that CHF patients were the most treated patients and most often needed re-treatment.

In many industrialized countries, cardiovascular disease is still the leading cause of death. Intensive efforts have been made to understand the basic mechanism. One area of inquiry in recent years has been the study of circadian rhythms. Various studies have proven the adverse effects of circadian rhythm disorders in the cardiovascular system (Chen and Yang, 2015; Jong, Chang and Kuo, 2010). This has become very important in the modern era, especially in developing countries, due to frequent disruptions in the normal rhythm caused by work shifts, artificial light, transmeridian air flights, and social activities (Chen and Yang, 2015).

II. Research Methods

This type of research is quantitative research with a quasi-experimental design used is a form of time series design. Where in this design the initial measurement (pretest) is done before the intervention is given and then the intervention is given according to the planned protocol. During interventions the measurement of treatment effects is repeated based on time travel (Dharma, 2015).

The purpose of the quasi-experimental design with time series design in this study was to look at differences in systolic and diastolic blood pressure, MAP, HR, RR and oxygen saturation in CHF patients in the circardian cycle before and after the right lateral position. The consideration of using a time series design is to see differences in hemodynamic values by giving a right lateral position with a different duration in CHF patients because of the effect of giving a right lateral position.

This research has been carried out in the Integrated Heart Care Room of RSUP. H. Adam Malik Medan. In this study, the room used was in the Cardiology Inpatient (RIK) 3rd floor and 4th floor which is an inpatient room for cardiac patients whose conditions are relatively stable adjusted to the desired sample criteria in this study and most of the samples taken at the RIK floor 4. RSUP. H. Adam Malik Medan was chosen as the research location because the hospital is a regional health referral center for the North and Central Sumatra regions which includes the Province of Nanggroe Aceh Darussalam, North Sumatra Province, Riau Province, and West Sumatra Province and is also a hospital education so that the number of respondents who can represent the population is more likely to be achieved. Researchers have also practiced before in the General Hospital. H. Adam Malik Medan making it easier for researchers to retrieve preliminary data. This research was carried out on August 24 to September 24, 2018.

In this study, the population was all CHF patients in the Integrated Heart Care Room of H. Adam Malik General Hospital Medan. The sampling technique used is non-random sampling technique or often referred to as non-probability sampling with consecutive sampling method. Where the sample chosen in this study must have inclusion criteria set by researchers to reduce the risk of bias, namely: CHF grade II and III patients treated at RIK on the 3rd and 4th floor of the Integrated Heart Care Unit of H. Adam Malik General Hospital Medan, not using ventilator aids, no contraindications were given to the right lateral position such as fractures, spinal injuries, post abdominal and thoracic surgeries, and respondents were willing to participate in this study. Sampling was carried out until the sample size was fulfilled, 32 respondents where 5 respondents were obtained at RIK on the 3rd floor and 27 respondents on RIK on the 4th floor. In this study, no samples were dropped out because at the time of the study, all respondents completed the procedure and found no patients who experienced impaired consciousness, patients who experience unstable hemodynamics, or patients who have GER.

The large number of samples obtained based on the power analysis table to determine the effect size for the two different test mean, where the equal power is 0.80 with $\alpha = 0.05$ and the estimated effect size is 0.08, then the number of samples (n) of 25 respondents is obtained. The use of parametric tests will be more representative if the sample size is at least 30 respondents and to reduce the bias of the confounding variable so that the effect size in this study is reduced to 0.7 and the power analysis table looks back. Based on the power analysis table to determine the effect size for the two mean difference test, where the equal power is 0.80 with $\alpha = 0.05$ and the estimated effect size is 0.7, then the sample size (n) of 32 respondents is obtained.

Data collection methods used in this study include 2 stages, namely the preparation phase and the implementation phase.

The measurement method in this study uses the research sheets and observation sheets. The research sheets are demographic data covering age, sex, degree of CHF, comorbidities, causes of CHF, use of oxygen and use of pharmacological drugs. The observation sheet was used to observe changes in hemodynamic values of CHF patients who were study respondents. Noninvasive hemodynamic values measured consisted of systolic and diastolic blood pressure, MAP, HR, RR and oxygen saturation.

Data analysis using univariate analysis was carried out using descriptive analysis through frequency distribution and percentage of data which included age, sex, CHF degree, comorbidities, causes of CHF, oxygen use and use of pharmacological drugs as well as hemodynamic data of CHF patients before and after intervention. to respondents. Bivariate analysis was performed to determine the hemodynamic differences in

CHF patients before the intervention and after the intervention of respondents using the mean difference test. Prior to the mean difference test, the normality of the research data is tested first.

III. Results

The results of the study on systolic BP measurements before being given an intervention (pretest) with after giving the right lateral position 10 minutes (posttest 1) the average difference of 5.25 mmHg with a value of 10.14 ($p < 0.05$), after 20 minutes intervention (posttest 2) average difference of 10.69 mmHg with tcount of 13.94 ($p < 0.05$), after 30 minutes of intervention (posttest 3) average difference of 15.41 mmHg with tcount of 19, 64 ($p < 0.05$). Whereas for diastolic BP before being given an intervention (pretest) with after giving the right lateral position 10 minutes (posttest 1) the average difference of 3.16 mmHg with a tcount of 5.90 ($p < 0.05$), after 20 minutes of intervention (posttest 2) average difference of 5.91 mmHg with tcount of 9.16 and value ($p < 0.05$), after 30 minutes of intervention (posttest 3) average difference of 8.19 mmHg with tcount of 12, 31 ($p < 0.05$). This shows that there is a significant difference between giving the right lateral position both after 10 minutes, 20 minutes and 30 minutes to systolic BP and diastolic BP before giving intervention in CHF patients. The results support the research hypothesis that there are differences in the effect of giving a right lateral position to hemodynamic changes (systolic BP and diastolic BP) of CHF patients.

The results of the study on the measurement of MAP before being given an intervention (pretest) with after giving the right lateral position 10 minutes (posttest 1) the average difference of 3.91 mmHg with a tcount of 8.73 ($p < 0.05$), after 20 minutes of intervention (posttest 2) average difference of 7.34 mmHg with a tcount of 11.75 ($p < 0.05$), after 30 minutes of intervention (posttest 3) an average difference of 10.56 mmHg with a tcount of 16.35 ($p < 0.05$). This shows that there is a significant difference between giving a right lateral position after 10 minutes, 20 minutes and 30 minutes to MAP before giving an intervention in CHF patients. The results support the research hypothesis that there are differences in the effect of giving a right lateral position to the hemodynamic changes (MAP) of CHF patients.

The results of the study on HR measurements before being given an intervention (pretest) with after giving the right lateral position 10 minutes (posttest 1) the average difference of 2.59 times/min with a tcount of 6.35 ($p < 0.05$), after 20 minutes of intervention (posttest 2) the average difference of 5.05 times/minute with a tcount of 13.29 ($p < 0.05$), after 30 minutes of intervention (posttest 3) the average difference of 7.53 times/minute with tcount value of 20.34 ($p < 0.05$). This shows that there is a significant difference between giving a right lateral position after 10 minutes, 20 minutes and 30 minutes to HR before giving an intervention in CHF patients. The results support the research hypothesis that there are differences in the effect of giving a right lateral position to the hemodynamic changes (HR) of CHF patients.

The results of the study on RR measurements before being given an intervention (pretest) with after giving the right lateral position 10 minutes (posttest 1) the average difference of 1.25 times/minute with a tcount of 5.81 ($p < 0.05$), after 20 minutes of intervention (posttest 2) average difference of 2.19 times/minute with a tcount of 7.57 ($p < 0.05$), after 30 minutes of intervention (posttest 3) average difference of 2.13 times/minute with tcount value of 6.34 ($p < 0.05$). This shows that there is a significant difference between giving a right lateral position after 10 minutes, 20 minutes and 30 minutes to the RR before administering an intervention in CHF patients. The results support the research hypothesis that there are differences in the effect of giving a right lateral position to hemodynamic changes (RR) of CHF patients.

The results of the study on the measurement of oxygen saturation before being given an intervention (pretest) with after giving the right lateral position 10 minutes (posttest 1) the average decrease in oxygen saturation by 28.00% and the average increase in oxygen saturation by 14.00% with the value of Zhitung of -4.13 ($p < 0.05$), after 20 minutes of intervention (posttest 2) the average increase in oxygen saturation was 15.50% with a Zhitung value of -4.86 ($p < 0.05$), after 30 minutes of intervention (posttest 3) the average decrease in oxygen saturation was 4.00%, and the average increase in oxygen saturation was 16.40% with a Zhitung value of -4.87 ($p < 0.05$). This shows that there is a significant difference between giving a right lateral position after 10 minutes, 20 minutes and 30 minutes to oxygen saturation before giving intervention in CHF patients. The results support the research hypothesis that there are differences in the effect of giving a right lateral position to hemodynamic changes (oxygen saturation) of CHF patients.

IV. Conclusion and Suggestion

4.1 Conclusion

Based on the research that has been done, it can be concluded that there are significant hemodynamic differences in systolic BP, diastolic BP, MAP, HR, RR, and oxygen saturation between before the intervention (pretest) and after the intervention (posttest) both after 10 minutes (posttest 1), after 20 (posttest 2), and after 30 minutes (posttest) the intervention was given right lateral position with each p value = 0,000. But based on the difference in the average value shows that the difference in the average value of the largest is the difference between measurements before being given an intervention with measurements after 30 minutes given the

intervention compared to the difference in the average value on other measurements so that it was concluded that giving the right lateral position is more influential after 30 minutes of administration of the right lateral position intervention in CHF patients.

4.2 Suggestion

Right lateral position adjustment can be used as one of the interventions in providing CHF nursing care. The right lateral position can be applied and becomes one of the nurses' independent interventions in maintaining hemodynamic stability in CHF patients, especially degrees II and III.

The results of this study are expected to increase the knowledge and insight of prospective nurses who are undergoing the education process by providing new knowledge before conducting direct practice in the practice area, about the benefits of giving a right lateral position compared to other positions. Positioning is used as a way to maintain hemodynamic stability in CHF patients.

Suggestions to health care centers, especially hospitals that provide inpatient care for CHF patients, conduct seminars or seminars and workshops on evidence based nursing in providing right lateral position to CHF patients. This is so that health workers who provide services to CHF patients can increase their knowledge and skills regarding the provision of the right lateral position. So that health workers can apply this intervention when providing nursing care to CHF patients and provide explanations and information to CHF patients and their families about the benefits of giving a right lateral position that can stabilize hemodynamics and can be used as one of the physioterapeutic interventions that can be applied to CHF patients who easy to do, without the need for additional costs and is a noninvasive measure, which will help patients begin the rehabilitation period, exercise mobilization, shorten the length of stay and as one of the lifestyle changes that can be applied to maintain the negative effects of heart failure.

The results of this study are also expected to be a reference for further research by considering the use of a control group and performed on CHF patients from degrees I - IV. Besides the need for measurement of heart rate variability (HRV) by using measuring devices such as ECGs to see the effect of position on the heart conduction system. For further research it is necessary to do research with randomize control trials or with mixed methods research.

Reference

[1] Benjamin, E.J., Go, A., Mozaffarian, D., Roger, V. L., Berry, J. D., Borden, B. D. et al. (2017). Heart Disease and Stroke Statistics—2017 Update: A Report from the American Heart Association. *AHA Journal.* https://doi.org/10.1161/CIR.0000000000000485.

[2] Chen, G. Y., and Kuo, C. D. (2015). The Effect of the Lateral Decubitus Position on Vagal Tone. *Anaesthesia, 52, 653 – 657.* Diunduh dari http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2044.1997.114-az0106.x/pdf.

[3] Dharma, K. K. (2015). *Metodelogi Penelitian Keperawatan: Panduan Melaksanakan dan Menerapkan Hasil Penelitian*. Jakarta: Trans Info Media.

[4] Fingar, K., and Washington, R. (2015). Trends in Hospital Readmissions for Four High-Volume Conditions, 2009–2013. *HCUP AHRQ Statistical Brief*, 196, 1-17. Diunduh dari https://www.hcup-us.ahrq.gov/reports/statbriefs/sb196-Readmissions-Trends-High-Volume-Conditions.jsp.

[5] Kementerian Kesehatan Republik Indonesia. (2014). *Riset Kesehatan Dasar* (*RIKESDAS*). Jakarta: Badan Penelitian dan Pengembangan Kesehatan.

[6] Mozaffarian, D., Benjamin, E. J., Go, A. S., Arnett, D. K., Blaha, M. J., Cushman, M., De Ferranti, S., Despres, J. P. et al. (2016). Heart Disease and Stroke Statistics-2015 Update: A Report From The American Heart Association. *Circulation, 131*(4), e29- e322. doi:10.1161/CIR.0000000000000152.

[7] Perhimpunan Dokter Spesialis Kardiovaskular Indonesia (PERKI). (2015). *Pedoman Tatalaksana Hipertensi dan Penyakit Kardiovaskuler*. Jakarta: PERKI.

[8] Rizka, F., Elly, N., and Dewi, G. (2014). Efek Posisi Istirahat Lateral Kanan terhadap Hemodinamik dan Kenyamanan Pasien Gagal Jantung di RS Jantung Harapan Kita: A Randomized Controlled Trial. *Proceeding from 2015 Riau International Nursing Conference.* 271-276, ISSN: 2461-1069.

[9] Siswanto, B. B., Nani, H., Erwinto, Rossana, B., Rarsari, S. P., and Naul, S. P. (2015). *Pedoman Tatalaksana Gagal Jantung.* Jakarta: Perhimpunan Dokter Spesialis Kardiovaskuler Indonesia.

[10] Yang, J. L., Chen, G. Y., and Kuo, C. D. (2010). Comparison of Effect Of 5 Recumbent Positions on Autonomic Nervous Modulation in Patients With Coronary Artery Disease. *Circulation Journal, 72(6), 902908*. Diunduh dari http://www.researchgate.net/publication/5347510_Comparison_of_effect_of_5_recumbent_positions_on_autonomic_nervous_modulation_in_patients_with_coronary_artery_disease/file/d912f50aaee543cee7.pdf.

Lilis Pujiati. "Effects of Right Lateral Positioning on Hemodynamic in Patients with CHF in the Period of Circadian Cycle in Medan" .IOSR Journal of Nursing and Health Science (IOSR-JNHS), vol. 8, no. 06 , 2019, pp. 75-78.