

Comparison of Effects of the Combination of Fentanyl Dexmedetomidin and Fenthanyl Midazolam on Cardiac Output in ICU Patients at HADAM Malik Hospital, Medan

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Abstract:-

Background: Patients in the ICU experience hemodynamic disorders, hemodynamics is the flow of blood in the body's circulatory system, either through the magna circulation (large circulation) or parva circulation (circulation in the lungs). Under normal conditions, hemodynamics will always be maintained in a physiological condition with neurohormonal control. The combination of opioids and benzodiazepines is often used in the induction and maintenance of anesthesia. Hemodynamic changes after the combination of the two drugs caused a significant decrease in the function of the cardiovascular system. Until now, studies assessing the effect of sedative drugs on cardiac output are still very rare.

Destination: This study aims to determine the comparison of fentanyl combined with dexmedetomidine and fentanyl combined with midazolam on cardiac output using USCOM in ICU patients at RSUP.H.Adam Malik Medan.

Method: This study is an Observational Analytical study to see the effect of the combination of Dexmedetomidine Fentanyl and Fentanyl midazolam on cardiac output using USCOM in intubated patients in the ICU H. Adam Malik Hospital.

Results: In this study, the mean systolic value before the dexmedetomidine combination fentanyl group before the intervention was found to be 120.74 ± 25.24 and the mean systolic value after 122.43 ± 3.79 . Meanwhile, the mean systolic value before the midazolam combination Fentanyl group before the intervention was 121.25 ± 16.99 and the mean systolic value after 121.50 ± 6.81 . The mean diastolic value before the dexmedetomidine combination fentanyl group before the intervention was 73.50 ± 8.22 and the mean diastolic value after 82 ± 2.87 . While the mean Systolic value before the dexmedetomidine combination Fentanyl group before the intervention was obtained an average of 121.25 ± 16.99 and the mean

diastolic value after 121.50 ± 6.81 with p value > 0.05 , the Systolic variable before, after and diastolic before and after normal distribution. The mean cardiac output in the dexmedetomidine combination fentanyl group before the intervention was found to have an average cardiac output of 6.46 ± 1.65 and the mean cardiac output value after 4.03 ± 0.74 with p value = 0.001 which means there was a significant difference between cardiac output before and after administration of the fentanyl combination dexmedetomidine group. Meanwhile, the mean cardiac output of Fentanyl in the midazolam combination before the intervention was found to have an average cardiac output of 6.10 ± 1.65 , the mean value of cardiac output after 4.71 ± 0.53 with p value = 0.01, which means that there is a significant difference between cardiac output before and after administration of Fentanyl with the combination of midazolam. . The mean cardiac output in the dexmedetomidine combination fentanyl group before the intervention was found to have an average cardiac output of 6.46 ± 1.65 and the mean cardiac output value after 4.03 ± 0.74 with p value = 0.001 which means there was a significant difference between cardiac output before and after administration of the fentanyl combination dexmedetomidine group. Meanwhile, the mean cardiac output of Fentanyl in the midazolam combination before the intervention was found to have an average cardiac output of 6.10 ± 1.65 , the mean value of cardiac output after 4.71 ± 0.53 with p value = 0.01, which means that there is a significant difference between cardiac output before and after administration of Fentanyl with the combination of midazolam. . The mean cardiac output in the dexmedetomidine combination fentanyl group before the intervention was found to have an average cardiac output of 6.46 ± 1.65 and the mean cardiac output value after 4.03 ± 0.74 with p value = 0.001 which means there was a significant difference between cardiac output before and after administration of the fentanyl combination dexmedetomidine group. Meanwhile, the mean cardiac output of Fentanyl in the midazolam

combination before the intervention was found to have an average cardiac output of 6.10 ± 1.65 , the mean value of cardiac output after 4.71 ± 0.53 with p value = 0.01, which means that there is a significant difference between cardiac output before and after administration of Fentanyl with the combination of midazolam. . 001 which means that there is a significant difference between cardiac output before and after administration of the Fentanyl combination Dexmedetomidine group. Meanwhile, the mean cardiac output of Fentanyl in the midazolam combination before the intervention was found to have an average cardiac output of 6.10 ± 1.65 , the mean value of cardiac output after 4.71 ± 0.53 with p value = 0.01, which means that there is a significant difference between cardiac output before and after administration of Fentanyl with the combination of midazolam. . 001 which means that there is a significant difference between cardiac output before and after administration of the Fentanyl combination Dexmedetomidine group. Meanwhile, the mean cardiac output of Fentanyl in the midazolam combination before the intervention was found to have an average cardiac output of 6.10 ± 1.65 , the mean value of cardiac output after 4.71 ± 0.53 with p value = 0.01, which means that there is a significant difference between cardiac output before and after administration of Fentanyl with the combination of midazolam. .

Conclusion: That each group affects cardiac output, but if we look at the difference in CO after and before the dexmedetomidine group is superior to the midazolam group.

Keywords:- Fentanyl, Dexmedetomidine, Midazolam, Cardiac Output, ICU.

I. INTRODUCTION

The Intensive Care Unit (ICU) is a special service unit in a hospital with special staff and special equipment, which is intended for observation, care and therapy of critically ill patients due to life-threatening or potentially life-threatening illness, trauma or complications. Patients in the ICU experience hemodynamic disorders, hemodynamics is the flow of blood in the body's circulatory system, either through the magna circulation (large circulation) or parva circulation (circulation in the lungs). Under normal conditions, hemodynamics will always be maintained in a physiological condition with neurohormonal control. However, in critically ill patients the control mechanism does not perform its function normally so that the hemodynamic status will not be stable.

Stroke volume variation can be determined by invasive or non-invasive monitoring. Ultrasonic cardiac output monitor (USCOM) is a non-invasive hemodynamic monitoring tool, which uses Doppler ultrasonic waves. Ultrasonic cardiac output monitor can measure cardiac output (CO), SV, SVV and several other hemodynamic parameters. Ultrasonic cardiac output monitor is easy to operate by placing the probe in the suprasternal notch or in

the pulmonary area, then this tool automatically records various hemodynamic parameters.

The ideal sedative for patients admitted to the ICU must have requirements such as: fast action, easy to control the depth of sedation, minimal effect on heart and lung function, no accumulated residual metabolites, inexpensive, and minimal side effects. At present, there are no drugs that can show all of the above effects. The benzodiazepines, opioid agonists, propofol, and 2-epinephrine agonists are the most widely used drugs in the ICU. Therefore, other sedating agents are needed for patients in the ICU.

Until now, studies assessing the effect of sedative drugs on cardiac output are still very rare. Therefore, based on the background and research references above, the researchers wished to compare the combination of fentanyl dexmedetomidine and fentanyl combined with midazolam on cardiac output values using USCOM in ICU patients at RSUP.H.Adam Malik Medan.

II. METHODS

This study is an Obsessional Analytical study to examine the effect of the combination of Dexmedetomidine Fentanyl and Fentanyl midazolam on cardiac output using USCOM in intubated patients in the ICU H. Adam Malik Hospital.

This research was conducted in the ICU RSUP. Haji Adam Malik (HAM) Medan. This research will take place from May 2021 until the sample is met, since the researcher determines the research title, prepares a research proposal, collects research data, and makes a research report until a research results seminar. The study population was intubated patients who were treated in the ICU of H. Adam Malik Central General Hospital Medan. The research sample was patients who were intubated in the ICU of the H. Adam Malik General Hospital Medan who met the research criteria. The technique of obtaining samples is by consecutive sampling, namely looking for patients who meet the inclusion and exclusion criteria until the required number of samples is met. The sample of each group is 16 samples, all research subjects are 32 samples. Randomization was carried out using a computerized randomization method using the website www.randomizer.org. The two groups were divided into groups A (fentanyl dexmedetomidine) and B (fentanyl Midazolam).

III. RESULTS

This study is an Obsessional Analytical study to examine the effect of the drug Dexmedetomidine combination of Fentanyl and Fentanyl combination of midazolam on cardiac output using USCOM in intubated patients in the ICU H. Adam Malik Hospital. Thus, each treatment group has a minimum of 16 samples, the sample of each group is 16 samples, all research subjects are 32 samples.

Characteristics	Combined fentanyl Dexmedetomidine	Midazolam combination fentanyl	p Nilai value
Gender, n (%)			
Man	10 (62.5%)	8 (50%)	0.829
Woman	6 (37.5%)	8 (50%)	
Age (years)	47±14.74	41±14.69	0.972
Religion			
Islam	9 (56.3%)	14 (87.5%)	0.211
Christian	7 (43.7%)	2 (12.5%)	
Term, n (%)			
Batak	6 (37.5%)4 (25%)	5 (31.3%)6 (37.5%)	
Java	6 (37.5%)	5 (31.3%)	0.561
Malay			

Table 1: Characteristics of the intervention group. Dexmedetomidine combination Fentanyl and Fentanyl combination midazolam on cardiac output

Based on Table 4.1, each group consisted of 16 study subjects with the proportion of male sex (62.5% vs 50%) greater than female (37.5% vs 50%) in the Dexmedetomidine group with the combination of Fentanyl and Fentanyl combination. midazolam. The mean age of the study subjects in the dexmedetomidine group with the combination of fentanyl was 47 ± 14.74 and that of the fentanyl group with the combination of midazolam $41 \pm$

14.69. Research subjects in the group of Dexmedetomidine combination Fentanyl based on religion found Islam (56.3%), Christian (43.7%). Research subjects in the Midazolam group with Fentanyl combination based on religion were found to be Muslim (87.5%), Christian (12.5%). Based on ethnicity in the dexmedetomidine group, the combination of fentanyl was found to be Batak (37.5%), Javanese (25%), and Malay (37.5%).

Characteristics	Combined fentanyl Dexmedetomidine	Midazolam combination fentanyl	p Nilai value
Cytolic Before	120.74 ± 25.24	121.25 ± 16.99	0.61
Cytolic After	122.43 ± 3.79	121.50 ± 6.81	0.58
Diastolic Before	80.81 ± 17.42	73.50 ± 8.22	0.48
Diastolic After	82.62 ± 3.79	82 ± 2.87	0.61

Table 2: Characteristics of the intervention group fentanyl combination of dexmedetomidine and fentanyl combination of midazolam against systolic and diastolic.

Based on table 4.2, the mean cytolitic value before the dexmedetomidine combination fentanyl group before the intervention was found to be an average of 120.74 ± 25.24 and the mean cytolitic value after 122.43 ± 3.79 . Meanwhile, the mean systolic value before the midazolam combination Fentanyl group before the intervention was 121.25 ± 16.99 and the mean cytolitic value after 121.50 ± 6.81 . The mean diastolic value before the dexmedetomidine combination

fentanyl group before the intervention was 73.50 ± 8.22 and the mean diastolic value after 82 ± 2.87 . While the mean Cytolic value before the dexmedetomidine combination Fentanyl group before the intervention was obtained an average of 121.25 ± 16.99 and the mean cytolitic value after 121.50 ± 6.81 with p value > 0.05 , the Cytolic variable before,

Characteristics	Combined fentanyl Dexmedetomidine	Midazolam combination fentanyl
CO Before	6.46±1.65	6.10±1.65
CO After	4.03±0.74	4.71 ± 0.53
P Value	0.01	0.01

Table 3: Comparison of cardiac output in the intervention group fentanyl in combination with dexmedetomidine and fentanyl in combination with midazolam.

Based on table 4.3, the mean cardiac output in the dexmedetomidine combination fentanyl group before the intervention was found to have an average cardiac output of 6.46 ± 1.65 and the mean cardiac output value after 4.03 ± 0.74 with p value = 0.001 which means there is a significant difference between cardiac output before and after administration of the dexmedetomidine group. Fentanyl combination. Meanwhile, the mean cardiac output of Fentanyl in the midazolam combination before the intervention was found to have an average cardiac output of 6.10 ± 1.65 , the mean value of cardiac output after 4.71 ± 0.53 with p value

= 0.01, which means that there is a significant difference between cardiac output before and after administration of Fentanyl with the combination of midazolam. .

IV. CONCLUSION

- There is a significant effect between the use of fentanyl in combination with dexmedetomidine on cardiac output in ICU patients at H Adam Malik Hospital, Medan.
- There is a significant effect between the use of fentanyl in the combination of Midazolam on cardiac output in ICU patients at H Adam Malik Hospital, Medan.
- We can see that each group affects cardiac output, but if we look at the difference in CO after and before the dexmedetomidine group is superior to the midazolam group.

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