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Research Article

Blood Glucose Profile Post Coronary Artery Bypass Graft in Rsup H. Adam Malik Medan

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ABSTRACT: Cardiopulmonary bypass (CPB) is widely used for systemic and oxygenated systemic settings during open heart surgery. (Simon L, 2004) To date there is yet to be found a definitive biochemical marker that can be considered prognostic in patients who subside. using a CPB machine. Hyperglycemia is defined as a glucose level above the normal physiological range. Normal blood glucose level is 70-120 mg and levels > 120 mg/dL is a diagnostic level for diabetes. During CPB and coronary artery bypass off-pump (OPCAB), most patients tend to have elevated blood glucose levels despite no previous diabetes medical history.

This study uses a descriptive study design study with a retrospective approach.

The study was conducted in the Division of Cardiac and Cardiac Surgery of the Department of Surgery of the Faculty of Medicine USU/ RSUP H. Adam Malik Medan. The study was conducted after the proposal was approved. The population in this study were patients who performed Coronary Artery ByPass Graft surgery using Cardiopulmonary Bypass (CBP) at RSUP H. Adam Malik Medan in 2016 (01 January - 31 December 2016).

The study involved patients who performed Coronary Artery ByPass Graft surgery using a CPB machine in RS. Haji Adam Malik Medan. The number of research subjects was 41 people. . Based on sex it is seen that more men (84.3%) than women. The mean of postoperative KGD H + 3 was the highest KGD that was 218,28 + 23,5 mg / dL. The use of Humulin R is most commonly used in insulin therapy with patients with postoperative CPB hyperglycemia. Based on the ANOVA test there was a significant difference in the value of KGD in H + 1 post CPB operation compared to H + 2 post CPB operation (p = 0.013, p <0.05).

INTRODUCTION

Cardiopulmonary bypass (CPB) is widely used for systemic and oxygenated systemic settings during open heart surgery. (Simon L, 2004) To date there is yet to be found a definitive biochemical marker that can be considered prognostic in patients who subside. using a CPB machine. Hyperglycemia is defined as a glucose level above the normal physiological range. Normal blood glucose level is 70-120 mg and levels > 120 mg/dL is a diagnostic level for diabetes. During CPB and coronary artery bypass off-pump (OPCAB), most patients tend to have elevated blood glucose levels despite no previous diabetes medical history. An increase in blood sugar levels is a metabolic characteristic that results from the consequences of hypoxia, but elevated blood sugar levels can also occur by a condition not caused by hypoxia. (Bandali, 2001) Research on the profile of blood glucose levels in postoperative patients Coronary Artery ByPass Graft at RSUP. Haji Adam Malik Medan does not exist yet. Therefore, the researcher will do this research

METHOD

This study uses a descriptive study design study with a retrospective approach.

The study was conducted in the Division of Cardiac and Cardiac Surgery of the Department of Surgery of the Faculty of Medicine USU/ RSUP H. Adam Malik Medan. The study was conducted after the proposal was approved. The population in this study were patients who performed Coronary Artery ByPass Graft surgery using Cardiopulmonary Bypass (CBP) at RSUP H. Adam Malik Medan in 2016 (01 January - 31 December 2016).

The study sample was part of the population with data and blood glucose values and surgical wound infections meeting the inclusion criteria.

Inclusion Criteria:

- Patients performed by CABG surgery using cardiopulmonary bypass
- Patients who have no history of Diabetes Mellitus disease
- All genders
- All age

Exclusion Criteria:

- Patients who died postoperatively before day 3
- Patients with congenital abnormalities

All study subjects were asked for the consent of the patient and the patient's family after being given an explanation of the patient's condition and the action to be performed. The study was conducted using humans as the subject of the study,

which during its implementation did not conflict with humanitarian values and biomedical research ethics codes. Permission is obtained from research ethics commission of Faculty of Medicine USU.

RESULTS

The study involved patients who performed Coronary Artery ByPass Graft surgery using a CPB machine in RS. Haji Adam Malik Medan. The number of research subjects was 41 people. Characteristics of research subjects are described in the following table:

Table 4.1 Characteristic of study subjects

Characteristic	N	%
Age (Mean ± SD)	52.5 ± 13,2	
Gender		
Male	35	84.3
Female	6	15,7
Blood glucose (KGD)		
KGD Pre Operasi (Mean)*	144.12 ± 12,4	
KGD H+1 Pasca Operasi *	193.29 ± 32,4	
KGD H+2 Pasca Operasi *	216.00 ± 3,78	
KGD H+3 Pasca Operasi	218.28 ± 23,5	
Terapi		
Tanpa Insulin	31	75,6
Humulin R	6	14,6
Novomix	3	7,4
Novorapid	1	2,4

- ANOVA test (p<0,05)

In the table above it appears that the mean age of patients is 52.5 + 13.2. Based on sex it is seen that more men (84.3%) than women. The mean of postoperative KGD H + 3 was the highest KGD that was 218,28 + 23,5 mg / dL. The use of Humulin R is most commonly used in insulin therapy with patients with postoperative CPB hyperglycemia. Based on the ANOVA test there was a significant difference in the value of KGD in H + 1 post CPB operation compared to H + 2 post CPB operation (p = 0.013, p <0.05).

The graph below illustrates the average profile of patient KGD values by using Insulin in pre and post surgery.

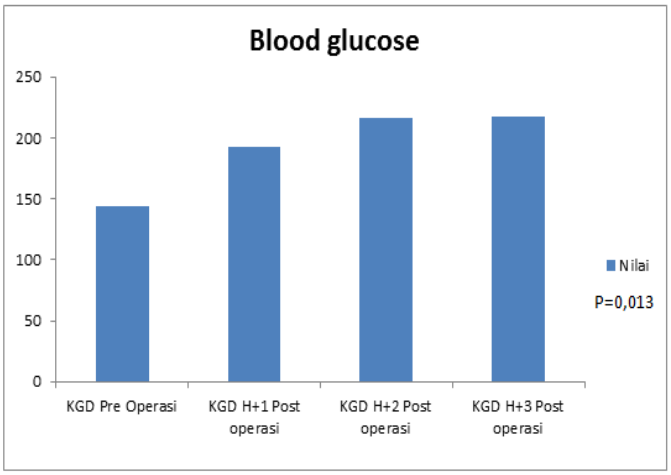

Figure 4.2 Graphic of mean blood glucose value

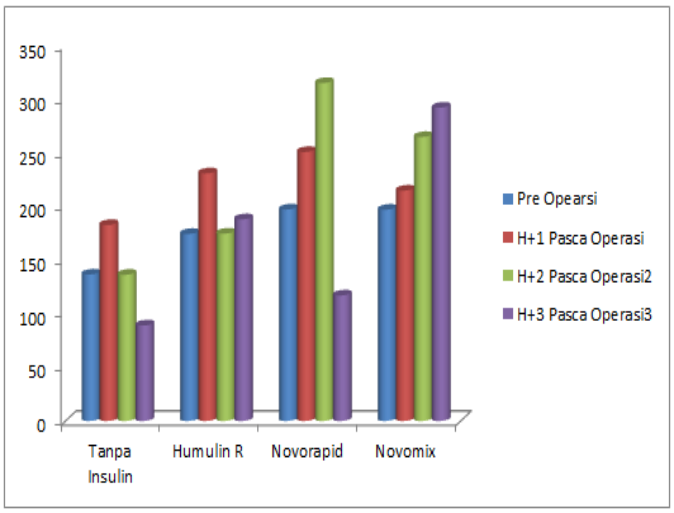

Figure 4.3 Graphic of blood glucose comparison based on insulin therapy

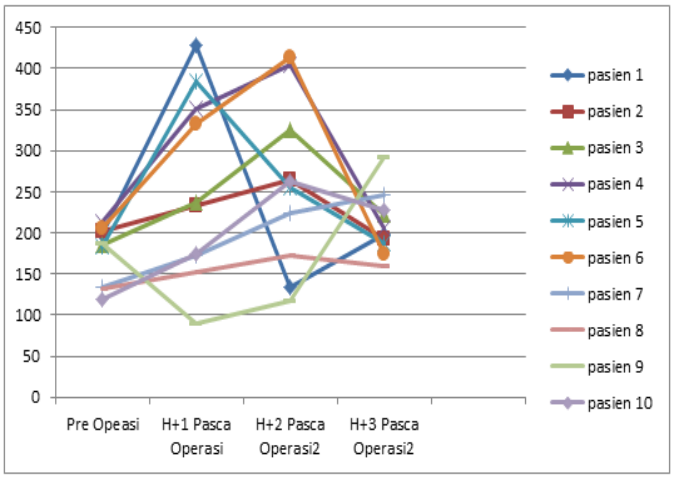

Figure 4.4 Change of blood glucose in patients receiving insulin.

In the picture above it appears that there is a change of KGD over time, the use of insulin gives the effect of decreasing KGD on Day 3 postoperatively on 7 patients that is on Humulin and Novorapid users. Patients using Humulin were patients 1,2,4,5,6, and 8. While patients using Novomix were patients 3, 7 and 9. For patients using Novorapid were patients 10.

DISCUSSION

Based on table 4.1 it can be seen that the mean age of subjects who undergo open heart surgery is 52.5 + 13.2 years. Similarly, the mean age study was 71.8 + 10.2 years (> 50 years)

In the table shows that the subject of research based on the most sex is male 35 subjects (84.3%). In other studies mentioned more men had open heart surgery with a ratio of 4: 1 to women. In another study also the ratio of male post CPB is 19:12 than women. (Paarmann et al., 2013). Figure 4.1 shows that the proportion of men with KGD> 200 mg / dL increases with time of observation. In preoperative, the proportion of men with KGD <200 mg / dL was only 88.6% while on day 1.2 and 3 postoperative decreased to 77.1%, 54.3% and 57.1%. In contrast, the percentage of KGD> 200 mg / dL over time increased in men, ie 11.4%, 22.9%, 45.7% and 42.9%.

The mean of postoperative KGD H + 3 was the highest KGD that was 218,28 + 23,5 mg / dL. This is lower than the first day. Figure 4.3 shows that patients who received insulin Novomix (N = 3) KGD did not return to normal, even increased over time, patients receiving Novorapid (N = 1) KGD increased until the 2nd postoperative day and decreased to a value KGD becomes normal on the 3rd day. For patients receiving Humulin R (N = 6) the controlled KGD value <200mg / dL.

In Figure 4.4. it appears that insulin use had a decreased effect of KGD on Day 3 postoperatively in 7 patients ie Humulin and Novorapid users. In accordance with the results of research, found that the use of Humulin R better than Novomix and Novorapid. Zerr's research suggests that the use of Humulin R is most commonly used in insulin therapy with post-CPB hyperglycemia patients. In graph 2 it appears that the use of Insulin can lower blood sugar levels in H + 3 postoperatively. Zerr's study reported useful results on the continued use of intravenous insulin infusion for the control of blood glucose in ICU. The effect is that it has resulted in an increase in glucose control; reduce infections, reduce morbidity and mortality (Zerr et al., 1997; Zimmerman, Mlynarek, Jordan, Rajda, & Horst, 2004). Patients were given subcutaneous insulin to maintain blood glucose levels between 150 - 200 mg / dl (Zerr et al., 1997). In this study blood glucose levels ranged between 175-240 mg / dl (Zerr et al., 1997). From 1991 Until 1998, an intravenous insulin protocol was used, for subsequent studies with diabetes patient outcomes (n = 595). The procedure used is to maintain blood glucose levels <200 mg / dl in the postoperative period (Zerr et al., 1997). Postoperative blood glucose control has been a major focus in the treatment of ICU to reduce mortality and morbidity, including infectious complications. Various insulin infusion protocols have been continuously published and widely modified.

The Lazar study showed that patients with and without diabetes with elevated blood glucose levels (> 180 mg / dl) would benefit from using intravenous insulin therapy to maintain levels below 180 mg / dl while in ICU (Lazar et al., 2009).

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