INTISARI

Latar Belakang: Penyakit kardiovaskuler menjadi salah satu masalah kesehatan utama di dunia, dengan sebagian besar kasus membutuhkan intervensi operasi. Penggunaan mesin *cardiopulmonary bypass* (CPB) pada prosedur bedah jantung dapat meningkatkan komplikasi pada pasien, seperti terjadinya hiperglikemia yang dikaitkan dengan luaran klinis yang buruk, termasuk peningkatan risiko infeksi pascaoperasi, lama rawat dan kematian. *The Institute for Healthcare Improvement and Society of Thoracic Surgeons Guidelines*, merekomendasikan pengendalian glukosa darah <180 mg/dL baik intraoperatif maupun selama perawatan di ICU. Pada prosedur bedah yang kompleks, seperti bedah kardiotoraks, sering terjadi pemanjangan durasi ventilasi mekanis akibat berbagai faktor dan belum dapat dijelaskan secara komprehensif.
Tujuan: Penelitian ini bertujuan untuk mengetahui apakah hiperglikemia intraoperasi dapat digunakan untuk memprediksi pemanjangan ventilasi mekanis pasca *cardiopulmonary bypass*.
Metode: Desain penelitian ini adalah observasional analitik dengan pendekatan *cohort retrospective*. Subjek penelitian adalah pasien operasi bedah jantung dengan CPB di RSUP Dr. Sardjito Yogyakarta pada bulan Juli-November 2023. Glukosa darah diperiksa pasca CPB. Subjek diklasifikasikan menjadi hiperglikemia dan non-hiperglikemia berdasarkan *cut off* 180 mg/dL, dan diamati luaran klinis lama ventilasi mekanis. Prediksi pemanjangan ventilasi mekanis dinyatakan dalam *Relative Risk* (RR) dengan analisis bivariat. Nilai p <0,05 dianggap bermakna secara statistik.
Hasil: Penelitian melibatkan 50 subjek, dengan 21 (42%) subjek hiperglikemia dan 29 (58%) subjek non-hiperglikemia. Kelompok hiperglikemia memiliki median durasi ventilasi mekanis lebih lama dibandingkan kelompok non-hiperglikemia, (100 jam vs. 20 jam, p=0,034). Hasil analisis bivariat faktor prediktor pemanjangan ventilasi mekanis, menunjukkan hasil signifikan pada durasi *aortic cross clamp* dan glukosa darah intraoperasi (berturut-turut; RR: 2,18; 95% CI 1,23-3,87 dan RR: 9,67; 95% CI 1,28-72,77).
Simpulan: Hiperglikemia intraoperasi terbukti sebagai faktor prediktor pemanjangan ventilasi mekanis pasca CPB.

Kata Kunci: hiperglikemia, *cardiopulmonary bypass*, ventilasi mekanis

ABSTRACT

Background: Cardiovascular disease is one of the major health problems in the world, with most cases requiring surgical intervention. The use of CPB machines in cardiac surgery procedures could increase complications in patients, such as hyperglycemia which is associated with poor clinical outcomes, including increased risk of postoperative infection, length of stay and death. The Institute for Healthcare Improvement and Society of Thoracic Surgeons Guidelines, recommend blood glucose control <180 mg/dL both intraoperatively and during ICU stay. In complex surgical procedures, such as cardiothoracic surgery, prolonged mechanical ventilation duration often occurs due to various factors and has not been comprehensively explained.
Objective: This study aims to determine whether intraoperative hyperglycemia could be used to predict prolonged mechanical ventilation after cardiopulmonary bypass.
Methods: The design of this study was an observational analytic study with a retrospective cohort approach. The subjects were cardiac surgery patients with CPB at Dr. Sardjito General Hospital, Yogyakarta in July-November 2023. Blood glucose was checked pasca CPB. Subjects were classified into hyperglycemia and non hyperglycemia, based on cut off of 180 mg/dL, and the clinical outcomes of prolonged mechanical ventilation were observed. Prediction of prolonged mechanical ventilation was expressed in Relative Risk (RR) with bivariate analysis. A p value <0.05 was considered statistically significant.
Results: The study involved 50 subjects, with 21 (42%) hyperglycemic subjects and 29 (58%) non-hyperglycemic subjects. The hyperglycemic group had a longer median of duration mechanical ventilation than the non-hyperglycemic group, (100 hours vs. 20 hours, p<0.001). The bivariate analysis of predictors for prolonged mechanical ventilation showed significant results in aortic cross clamp time and intraoperative blood glucose (RR: 2,18; 95% CI 1,23-3,87 and ; RR: 9,67; 95% CI 1,28-72,77 respectively).
Conclusion: Intraoperative hyperglycemia has been shown to be a predictive factor for prolonged mechanical ventilation after CPB.

Keywords: hyperglycemia, cardiopulmonary bypass, mechanical ventilation