

Association between Neutrophil to Lymphocyte Ratio and Post Operative Atrial Fibrillation after Coronary Artery Bypass Graft Operation

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ABSTRACT

Background: Post operative atrial fibrillation (POAF) is associated with cardiovascular outcomes such as stroke, heart failure, and mortality. The use of cardio pulmonary bypass and ischemic reperfusion injury during cardiac surgery causes inflammation. Inflammation shortens atrial effective refractory period and makes disarray conduction. Neutrophil to lymphocyte ratio (NLR) is suspected to be a biomarker that represents the inflammatory response as a modulator of POAF, but data are still lacking. This study analyzes the association between NLR and POAF after coronary artery bypass graft (CABG) operation.

Method: This is an observational analytic study, involving patients after the CABG procedure in Kariadi Hospital between June 2022 to September 2023. NLR is assessed in the first three hours after operation. ECG Holter was attained for 96 hours post-CABG procedure.

Result: The total subject was 62 patients, consisting of 57 men and 5 women with a mean age of $58,7 \pm 6.39$ years. Mean postoperative NLR 4.95 ± 2.17 with a median of 4.56 (1.52-11.00). There was a significant association between post-operative NLR with POAF after CABG ($p=0.006$, OR 4.64, 95%CI 1.50-14.35). High inotropic dose and β -blocker initiation time less than 45 hour associate significantly with POAF after CABG ($p<0.001$, OR 6.94 dan $p=0.001$, OR 0.17). Multivariate analysis consisting of NLR, hypertension, high inotropic dose, and β -blocker initiation time less than 45 hours showed there was a significant association only between Postoperative NLR with POAF after CABG ($p=0.04$, OR 3.74, 95% CI 1.04-13.27).

Conclusion: Postoperative NLR is associated significantly with POAF after CABG.

Kata Kunci: Neutrophil to Lymphocyte Ratio, Post Operative Atrial Fibrillation, coronary artery bypass graft.

Hubungan antara Nilai Rasio Neutrofil Limfosit terhadap Kejadian Fibrilasi Atrium Pasca Operasi Bedah Pintas Arteri Koroner

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ABSTRAK

Latar Belakang: Fibrilasi atrium pasca operasi (FAPO) berasosiasi dengan kejadian kardiovaskuler berupa stroke, gagal jantung dan mortalitas. Inflamasi diakibatkan oleh penggunaan *cardio pulmonary bypass* (CPB) dan iskemik reperfusi injury yang berlangsung selama operasi. Inflamasi memendekkan *atrial effective refractory period* dan membuat gangguan konduksi listrik. Rasio neutrofil limfosit (RNL) dapat digunakan sebagai biomarker respons inflamasi yang berperan sebagai modulator fibrilasi atrium, namun data masih terbatas. Penelitian ini bertujuan untuk menganalisis hubungan antara nilai rasio neutrofil limfosit terhadap kejadian FAPO pasca bedah pintas arteri koroner (BPAK).

Metode: Penelitian observasional analitik, melibatkan pasien yang menjalani BPAK dalam periode Juni 2022 hingga September 2023 di RSUP dr. Kariadi. RNL di hitung tiga jam awal pasca operasi. Perekaman holter EKG dilakukan selama 96 jam pasca BPAK.

Hasil: Jumlah subjek adalah 62 pasien, yaitu 57 laki-laki dan 5 perempuan dengan rerata usia $58,7 \pm 6,39$ tahun. Rerata nilai RNL pasca operasi $4,95 \pm 2,17$ dengan median 4.56 (1.52-11.00). Didapatkan asosiasi signifikan antara RNL pasca operasi dengan FAPO BPAK ($p=0.006$, OR 4.64, 95%KI 1.50-14.35). Inotropik dosis tinggi dan inisiasi β -blocker <45 jam berasosiasi signifikan terhadap FAPO BPAK ($p<0.001$, OR 6.94 dan $p=0.001$, OR 0.17). Analisis multivariat dilakukan pada variabel RNL, hipertensi, penggunaan inotropik dosis tinggi dan waktu inisiasi β -blocker <45 jam, didapatkan asosiasi signifikan hanya antara RNL pasca operasi dengan FAPO BPAK ($p=0.04$, OR 3.71, 95% IK 1.04-13.27).

Kesimpulan: Terdapat asosiasi signifikan antara Nilai RNL pasca operasi dengan Kejadian FAPO BPAK

Kata Kunci: Rasio neutrofil limfosit, Fibrilasi atrium pasca operasi, Bedah pintas arteri koroner.