

INTISARI

Latar Belakang: Bakteremia adalah adanya bakteri pada aliran darah yang dapat memicu respon inflamasi sistemik hingga sepsis. Salah satu komponen penting yang berperan adalah trombosit. Pada bakteremia komponen dinding bakteri berikatan dengan reseptor endotel dan trombosit kemudian trombosit memulai proses aktivasi. Trombosit mengalami swelling dan membentuk pseudopodia. Volume trombosit membesar, ditandai dengan peningkatan *platelet large cell ratio* (PLCR). Disfungsi dan aktivasi trombosit berhubungan dengan peningkatan risiko perburukan kondisi dan kebutuhan terapi intensif. Bakteremia dengan disfungsi trombosit berpotensi mengalami keparahan klinis dan memperpanjang lama rawat inap di ruang intensif anak sehingga dapat meningkatkan beban sumber daya rumah sakit. Salah satu *scoring* dalam memprediksi mortalitas pasien bakteremia adalah *Pitt Bacteremia Score*, yang terdiri dari komponen yang dapat mencerminkan disfungsi organ.

Tujuan: Mengevaluasi hubungan PLCR dan keparahan penyakit dengan *Pitt Bacteremia Score* pada pasien bakteremia anak di ruang intensif.

Metode penelitian: Desain penelitian adalah studi *cross sectional*. Data dari *Laboratory Information System* (LIS) dan *Electronic Medical Record* (EMR) RS Sardjito. Subjek penelitian adalah anak di ruang rawat inap intensif dengan kultur darah positif di tahun 2022 yang memenuhi kriteria inklusi dan eksklusi. Data darah rutin dan indeks trombosit dikumpulkan pada satu titik pada pengambilan sampel kultur darah. Identifikasi bakteri dilakukan dengan VITEK 2 *Compact*. Variabel numerik dikategorikan berdasarkan nilai median, kemudian dilakukan perhitungan *prevalence ratio* (PR) untuk menilai hubungan PLCR dengan keparahan penyakit pada pasien bakteremia anak di ruang intensif.

Hasil Penelitian: Subjek pada penelitian ini berjumlah 104 subjek. Hasil analisis bivariat PLCR dan *Pitt bacteremia score* menunjukkan hasil $p = p < 0,001$ yang berarti terdapat perbedaan yang bermakna secara statistik dan didapatkan nilai *Prevalence ratio* (PR) sebesar 1,39 yang berarti kelompok dengan nilai PLCR $\geq 29,9$ memiliki prevalensi kejadian outcome sekitar 39% lebih tinggi dibandingkan kelompok PLCR $< 29,9$. Interval kepercayaan 95% (1,15–1,68) menunjukkan rentang nilai PR yang mungkin sebenarnya di populasi, dengan tingkat keyakinan 95%. Selanjutnya dilakukan uji multivariat untuk mengevaluasi hubungan variabel tersebut apakah saling mempengaruhi terhadap luaran *Pitt Bacteremia Score* dengan menggunakan model regresi logistik. Didapatkan hanya PLCR yang berhubungan signifikan dengan *Pitt bacteremia score* ($p=0,019$).

Simpulan: Nilai *platelet large cell ratio* berhubungan dengan keparahan penyakit yang dinilai dengan *Pitt bacteremia score*.

Kata kunci: *platelet large cell ratio* (PLCR), *Pitt Bacteremia Score*, PICU, NICU

ABSTRACT

Background: Bacteremia is the presence of bacteria in the bloodstream that can trigger a systemic inflammatory response progressing to sepsis. One important component involved is platelets. In bacteremia, bacterial cell wall components bind to endothelial and platelet receptors, after which platelets initiate an activation process. Platelets undergo swelling and form pseudopodia. Platelet volume enlarges, marked by an increase in platelet large cell ratio (PLCR). Platelet dysfunction and activation are associated with an increased risk of clinical deterioration and the need for intensive therapy. Bacteremia accompanied by platelet dysfunction has the potential to result in clinical severity and prolong the length of stay in the pediatric intensive care unit, thereby increasing the burden on hospital resources. One scoring system used to predict mortality in bacteremia patients is the Pitt Bacteremia Score, which consists of components that can reflect organ dysfunction.

Objective: Evaluating the relationship between PLCR and disease severity based on Pitt Bacteremia Score in pediatric patients with bacteremia in the intensive care unit.

Methods: This study employed a cross-sectional design. Data were obtained from the Laboratory Information System (LIS) and Electronic Medical Records (EMR) of Sardjito Hospital. The study subjects were children in the intensive care unit with positive blood cultures in 2022 who met the inclusion and exclusion criteria. Routine blood data and platelet indices were collected at the time of blood culture sampling. Bacterial identification was performed using the VITEK 2 Compact system. Numerical variables were categorized based on median values, and prevalence ratios (PR) were calculated to assess the association between PLCR and disease severity in pediatric patients with bacteremia in the intensive care unit.

Results: The study involved 104 subjects. Bivariate analysis of PLCR and the Pitt bacteremia score yielded a p-value of <0.001 , indicating a statistically significant difference; a prevalence ratio (PR) of 1.39 was observed, meaning the group with a $PLCR \geq 29.9$ had a 39% higher prevalence of the outcome compared to the group with a $PLCR < 29.9$. The 95% confidence interval (1.15–1.68) represents the range of possible true PR values in the population with 95% confidence. Subsequently, a multivariate analysis using a logistic regression model was conducted to evaluate the interrelationships of the variables regarding the Pitt bacteremia score outcome. The results showed that only PLCR was significantly associated with the Pitt bacteremia score ($p=0.019$).

Conclusion: The platelet large cell ratio is associated with disease severity as assessed by the Pitt bacteremia score.

Keywords: platelet large cell ratio (PLCR), Pitt bacteremia score, PICU, NICU