

## ABSTRAK

**Pendahuluan:** Cedera otak traumatik (COT) masih merupakan masalah kesehatan global terkait mortalitas dan morbiditasnya. Computed tomography (CT) Scan kepala adalah pilihan utama dalam evaluasi cedera otak traumatik pada fase akut serta menyediakan informasi diagnostik dan rencana intervensi operasinya. Deskripsi pada CT scan dapat dideskripsikan berdasarkan klasifikasi Marshall dan Rotterdam dengan keunggulan dan perbedaan masing-masing. Tujuan penelitian ini adalah untuk membandingkan antara klasifikasi Marshall dan Rotterdam dalam menggambarkan luaran dengan menilai *Glasgow Outcome Scale* pasien dengan cedera otak traumatik pada akhir perawatan di Departemen Bedah Saraf Rumah Sakit Hasan Sadikin, Bandung.

**Metode:** Penelitian ini adalah penelitian kohort retrospektif analisis yang dilakukan antara Agustus 2021 hingga Agustus 2022 di Rumah Sakit Umum Pusat Dr. Hasan Sadikin, Bandung. Data demografis dasar, GCS saat masuk, Klasifikasi CT scan berdasarkan Marshall dan Rotterdam serta GOS (*favorable* dan *unfavorable*) dianalisis. Analisis korelatif dinilai menggunakan uji korelasi Rank Spearman. Sedangkan analisis komparatif menggunakan Mann Whitney. Perbandingan akurasi menggunakan analisis *receiver operating characteristic* (ROC). Analisis multivariat menggunakan regresi logistik biner

**Hasil:** Hasil penelitian ini menunjukkan bahwa cedera kepala traumatik lebih sering terjadi pada laki-laki (85,34%) dengan usia rata-rata  $34 \pm 13$  tahun. Mayoritas dari sampel penelitian memiliki lesi campuran (49.14%) dengan lesi terbanyak adalah perdarahan subarachnoid (37.93%), kemudian contusion (29.31%), selanjutnya perdarahan epidural (28.45%), perdarahan intraserebral traumatik (27.59%). Dengan Mortalitas Marshall I – VI (12.5%; 15%; 40%; 37.5%; 9,7%; 37.5%) dan Mortalitas Rotterdam 1 – 6 (0%; 5.6%; 12.8%; 16.7%; 50%; 66.7%). *Marshall CT Classification* tidak memiliki korelasi yang signifikan terhadap GOS ( $r = -0.032$ ;  $p = 0.732$ ) dengan hasil ROC yang tidak dapat digunakan sebagai prediktor (AUC = 0.526; *sensitivity* 50%; *specificity* 56.3%), sedangkan *Rotterdam CT score* memiliki korelasi negatif signifikan yang lemah terhadap nilai GOS ( $r = -0.389$ ;  $p < 0.0001$ ) dengan hasil ROC yang dapat digunakan sebagai prediktor yang lemah (AUC = 0.681; *sensitivity* 88.9%; *specificity* 61.2%). Dari analisis bivariat yang dilanjutkan analisis multivariat didapatkan bahwa *Rotterdam CT Score* berhubungan signifikan sebesar 7.650 kali, sedangkan *Marshall CT Classification* tidak berhubungan secara signifikan terhadap GOS.

**Kesimpulan:** Terdapat perbedaan antara *Marshall CT Classification* dan *Rotterdam CT Score* dalam menggambarkan luaran pasien cedera otak traumatik, yang dapat terlihat dari korelasi signifikan dari *Rotterdam CT score* terhadap nilai GOS.

**Keywords:** *Marshall CT Classification, Rotterdam CT Score, Traumatic Brain Injury, Glasgow Outcome Scale*

## ABSTRACT

**Introduction:** Traumatic brain injury (TBI) is still a global health problem in terms of mortality and morbidity. Computed tomography (CT) scan of the head is the preferred diagnostic imaging for evaluating traumatic head injury in the acute phase and provides diagnostic information and plans for surgical intervention. Descriptions on CT scans can be described based on the Marshall and Rotterdam classifications with advantages and differences of each. The purpose of this study was to compare the Marshall and Rotterdam Classifications in describing the patients outcomes using Glasgow Outcome Scale with traumatic head injuries at the end of treatment at the Department of Neurosurgery at Hasan Sadikin Hospital, Bandung based on the Glasgow Outcome Scale (GOS).

**Methods:** This was a cohort retrospective analytic study which was conducted between August 2021 and August 2022 at Dr. Hasan Sadikin General Hospital, Bandung. Baseline demographic data, GCS at admission, Marshall and Rotterdam CT scan classification and GOS (favorable and unfavorable) were analysed. Correlative analysis was assessed using Rank Spearman. Comparative study was assessed using Mann Whitney. Accuracy ratio analysis was assessed using receiver operating characteristic (ROC). Multivariate analysis was assessed using binary logistic regression\

**Results:** The results of this study indicate that traumatic head injury is more common in males (85.34%) with an average age of  $34 \pm 13$  years. The majority of the study sampel had mixed lesions (49.14%) with the most lesions being subarachnoid hemorrhage (37.93%), followed by cerebral contusion (29.31%), then epidural bleeding (28.45%), and last, traumatic intracerebral bleeding (27.59%). Mortality of Marshall I – VI (12.5%; 15%; 40%; 37.5%; 9.7%; 37.5%) and Rotterdam 1 – 6 (0%; 5.6%; 12.8%; 16.7%; 50%; 66.7%). Marshall CT Classification does not have significant correlation with GOS ( $r = -0.032$ ;  $p = 0.732$ ) with ROC result that can not be used as predictor (AUC = 0.526; sensitivity 50%; specificity 56.3%), meanwhile Rotterdam CT score has significant weak negative correlation with GOS ( $r = -0.389$ ;  $p < 0.0001$ ) with ROC result can be used as weak predictor (AUC = 0.681; sensitivity 88.9%; specificity 61.2%). Bivariate and Multivariate analysis show that Rotterdam Score has significant relation 7.650 times, meanwhile Marshall CT Classification has no signifikan relation to the GOS.

**Conclusion:** There is a difference between the Marshall CT Classification and the Rotterdam CT Score in describing the outcomes of traumatic brain injury patients, which was shown by the significant correlation of the Rotterdam CT score to the GOS value.

**Keywords:** Marshall CT Classification, Rotterdam CT Score, Traumatic Brain Injury, Glasgow Outcome Scale