

ABSTRAK

Latar belakang: *Prolonged mechanical ventilation* (PMV) pada pasien pasca kraniotomi dapat meningkatkan risiko komplikasi, lama perawatan intensif, dan penggunaan sumber daya rumah sakit. Kondisi neurologis praoperasi, *midline shift*, dan lokasi lesi diduga berhubungan dengan kejadian PMV.

Tujuan: Mengetahui hubungan *Glasgow Coma Scale* (GCS) praoperasi, *midline shift*, dan lokasi lesi secara individual maupun bersama-sama dengan kejadian PMV serta menentukan parameter yang paling kuat berasosiasi.

Metode: Penelitian kohort retrospektif ini melibatkan 161 pasien pasca kraniotomi yang dirawat di ICU RSUP dr. Kariadi Semarang pada Januari–Desember 2024. PMV didefinisikan sebagai ventilasi mekanik selama ≥ 96 jam pascaoperasi. Analisis dilakukan menggunakan uji Mann–Whitney, *chi-square*, regresi logistik biner dan hierarkis, serta kurva ROC.

Hasil: Sebanyak 49 pasien (30,4%) mengalami PMV. Pada analisis bivariat, GCS praoperasi ($p = 0,002$), *midline shift* ($p = 0,012$), dan lokasi lesi ($p = 0,047$) berhubungan bermakna dengan PMV. Pada analisis multivariat, GCS praoperasi (adjusted OR = 0,824; 95% CI 0,714–0,951; $p = 0,008$), *midline shift* ≥ 5 mm (adjusted OR = 3,429; 95% CI 1,501–7,835; $p = 0,003$), dan lokasi lesi infratentorial (adjusted OR = 4,519; 95% CI 1,704–11,984; $p = 0,002$) merupakan prediktor independen PMV. Model gabungan bermakna secara simultan ($\chi^2 = 22,618$; $p < 0,001$), memiliki kecocokan memadai (Hosmer–Lemeshow $p = 0,631$), dan AUC sebesar 0,706 (95% CI 0,618–0,794). Berdasarkan statistik Wald, lokasi lesi infratentorial merupakan parameter yang paling kuat berasosiasi dengan PMV.

Kesimpulan: GCS praoperasi, *midline shift* ≥ 5 mm, dan lokasi lesi infratentorial berasosiasi secara independen dengan PMV. Kombinasi ketiganya memberikan kecocokan model yang lebih baik dibandingkan penggunaan masing-masing variabel secara terpisah.

Kata kunci: *Glasgow Coma Scale*, *midline shift*, lokasi lesi, *prolonged mechanical ventilation*, kraniotomi.

ABSTRACT

Background: Prolonged mechanical ventilation (PMV) after craniotomy may increase the risk of complications, intensive care unit length of stay, and hospital resource utilization. Preoperative neurological status, midline shift, and lesion location may be associated with PMV.

Aim: To determine the individual and simultaneous associations of preoperative Glasgow Coma Scale (GCS), midline shift, and lesion location with PMV and to identify the parameter most strongly associated with PMV.

Methods: This retrospective cohort study included 161 post-craniotomy patients admitted to the intensive care unit of Dr. Kariadi General Hospital, Semarang, from January to December 2024. PMV was defined as postoperative mechanical ventilation for ≥ 96 hours. Data were analyzed using the Mann–Whitney test, chi-square test, binary and hierarchical logistic regression, and receiver operating characteristic curve analysis.

Results: PMV occurred in 49 patients (30.4%). In the bivariate analysis, preoperative GCS ($p = 0.002$), midline shift ($p = 0.012$), and lesion location ($p = 0.047$) were significantly associated with PMV. In the multivariable analysis, preoperative GCS (adjusted OR = 0.824; 95% CI 0.714–0.951; $p = 0.008$), midline shift ≥ 5 mm (adjusted OR = 3.429; 95% CI 1.501–7.835; $p = 0.003$), and infratentorial lesion location (adjusted OR = 4.519; 95% CI 1.704–11.984; $p = 0.002$) were independent predictors of PMV. The combined model was statistically significant ($\chi^2 = 22.618$; $p < 0.001$), demonstrated adequate goodness of fit (Hosmer–Lemeshow $p = 0.631$), and had an AUC of 0.706 (95% CI 0.618–0.794). Based on the Wald statistic, infratentorial lesion location was the parameter most strongly associated with PMV.

Conclusions: Preoperative GCS, midline shift ≥ 5 mm, and infratentorial lesion location were independently associated with PMV. Combining these variables provided a better-fitting model than using each variable separately.

Keywords: Glasgow Coma Scale, midline shift, lesion location, prolonged mechanical ventilation, craniotomy.