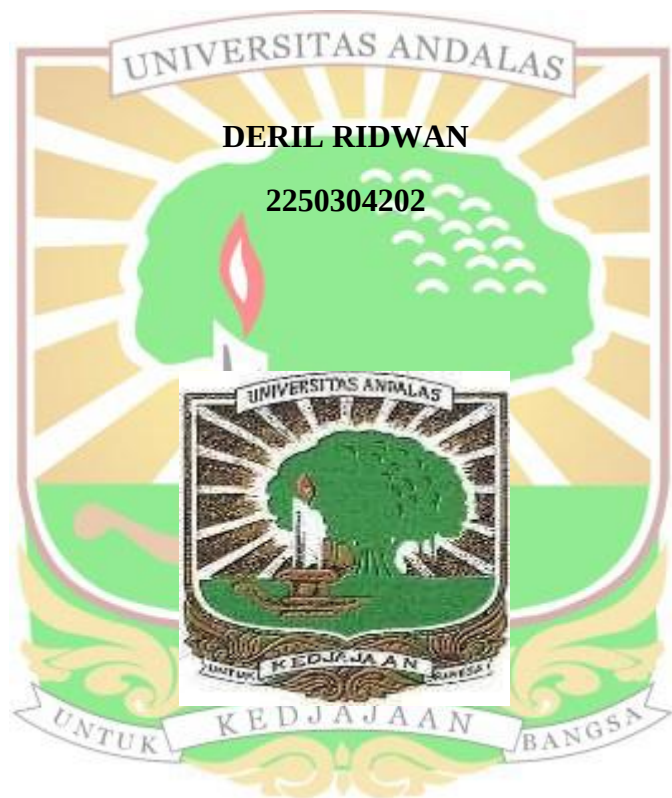


**PERBANDINGAN INDEKS ROX, P-ROX, MP-ROX, ROX-HR, RASIO SF,
DAN CRS SEBAGAI PREDIKTOR KEGAGALAN TERAPI
HIGH-FLOW NASAL CANNULA PADA ANAK DI
*PEDIATRIC INTENSIVE CARE UNIT***

TESIS



**PROGRAM STUDI KESEHATAN ANAK PROGRAM SPESIALIS
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ABSTRAK

PERBANDINGAN INDEKS ROX, P-ROX, MP-ROX, ROX-HR, RASIO SF, DAN CRS SEBAGAI PREDIKTOR KEGAGALAN TERAPI HIGH-FLOW NASAL CANNULA PADA ANAK DI PEDIATRIC INTENSIVE CARE UNIT

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Latar Belakang: Gawat napas merupakan salah satu indikasi utama perawatan di *pediatric intensive care unit* (PICU). *High-flow nasal cannula* (HFNC) semakin sering digunakan karena relatif lebih nyaman saat digunakan. Deteksi dini kegagalan HFNC penting untuk mencegah keterlambatan eskalasi terapi, namun saat ini belum ada kesepakatan indeks prediktor kegagalan terapi HFNC pada anak.

Metode: Penelitian kohort observasional prospektif ini dilakukan di PICU RSUP Dr. M. Djamil Padang dan RS Universitas Andalas pada Juli 2025–Februari 2026. Anak dengan gawat napas yang mendapat HFNC dilakukan pemantauan Indeks ROX, P-ROX, mP-ROX, ROX-HR, SF ratio, serta CRS dinilai pada awal terapi, 1 jam, 2 jam, dan 24 jam. Kemampuan diskriminatif tersebut dalam memprediksi kegagalan HFNC dianalisis menggunakan kurva ROC.

Hasil: Penelitian ini menemukan bahwa terapi HFNC efektif diberikan pada anak dengan gawat napas di PICU, dengan angka keberhasilan terapi 78 dari 82 pasien (95,1%), sedangkan kelompok gagal sebanyak 4 pasien (4,9%). Indeks ROX, P-ROX, mP-ROX, ROX-HR, dan rasio SF menunjukkan kemampuan diskriminatif yang buruk di seluruh titik waktu pengukuran, dengan nilai AUC berkisar antara 0,033–0,349 dan sensitivitas yang rendah (25%). CRS menunjukkan kemampuan prediktif yang lebih baik dibandingkan seluruh indeks lainnya, dengan AUC 0,750 pada saat inisiasi (sensitivitas 75,0%, spesifisitas 89,5%, *cut-off* 7,50), AUC 0,832 pada jam ke-1 (sensitivitas 100%, spesifisitas 92,1%, *cut-off* 6,50), dan AUC 0,794 pada jam ke-2 (sensitivitas 75,0%, spesifisitas 97,4%, *cut-off* 6,50).

Kesimpulan : CRS menunjukkan kemampuan diskriminatif yang lebih baik dibandingkan indeks ROX, P-ROX, mP-ROX, ROX-HR, dan rasio SF sebagai prediktor kegagalan terapi HFNC pada pasien pediatrik, namun validasi penelitian lanjutan dengan proporsi kegagalan lebih besar diperlukan sebelum dapat direkomendasikan secara definitif

Keywords

High-flow nasal cannula; pediatric intensive care unit; kegagalan HFNC; indeks prediktif.

ABSTRACT

Comparison of ROX Index, P-ROX, mP-ROX, ROX-HR, SF Ratio, and CRS as Predictors of High-Flow Nasal Cannula Therapy Failure in Children in the Pediatric Intensive Care Unit

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Background: Respiratory distress is a leading cause of PICU admission. HFNC is increasingly used due to its comfort and tolerability, yet early recognition of treatment failure remains critical to prevent delayed escalation. No consensus exists on the most accurate predictor of HFNC failure in children.

Method: This prospective observational cohort study was conducted in the PICUs of Dr. M. Djamil General Hospital and Universitas Andalas Hospital, Padang, from July 2025 to February 2026. Children with respiratory distress receiving HFNC were monitored for the ROX, P-ROX, mP-ROX, ROX-HR, SF ratio, and CRS, which were assessed at baseline and at 1, 2, and 24 hours after initiation. The discriminative ability of these parameters in predicting HFNC failure was evaluated using ROC curve analysis.

Result: This study found that HFNC therapy was effective in children with respiratory distress in the PICU, with a treatment success rate of 78 out of 82 patients (95.1%), while 4 patients (4.9%) were classified as the failure group. The ROX, P-ROX, mP-ROX, ROX-HR, and SF ratio demonstrated poor discriminatory ability across all measurement timepoints, with AUC values ranging from 0.033 to 0.349 and low sensitivity (25%). CRS showed better predictive ability than all other indices, with an AUC of 0.750 at initiation (sensitivity 75.0%, specificity 89.5%, cut-off 7.50), an AUC of 0.832 at 1 hour (sensitivity 100%, specificity 92.1%, cut-off 6.50), and an AUC of 0.794 at 2 hours (sensitivity 75.0%, specificity 97.4%, cut-off 6.50).

Conclusion : CRS demonstrated better discriminatory ability than the ROX, P-ROX, mP-ROX, ROX-HR, and SF ratio as a predictor of HFNC therapy failure in pediatric patients; however, further validation studies with a larger proportion of failure cases are needed before it can be definitively recommended.

Keywords :High-flow nasal cannula; Predictive Index, Pediatric intensive care unit, HFNC failure