

TEKNIK PREOKSIGENASI TERHADAP NILAI END-TIDAL OKSIGEN (ETO₂) PADA PASIEN ANESTESI UMUM

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ABSTRAK

Latar Belakang: Anestesi umum merupakan prosedur medis yang dilakukan pada lebih dari 300 juta pasien per tahun di seluruh dunia, dengan risiko utama berupa hipoksemia selama fase induksi akibat periode apnea pra-intubasi. Preoksigenasi menjadi langkah krusial untuk meningkatkan cadangan oksigen alveolar, namun pemilihan teknik yang paling efektif masih menjadi kesenjangan ilmiah, khususnya perbandingan teknik *deep breathing* dan tidal volume normal menggunakan indikator End-Tidal O₂ (EtO₂).

Tujuan: Penelitian ini bertujuan menganalisis perbedaan nilai EtO₂ pada pasien anestesi umum berdasarkan teknik preoksigenasi di RSUP dr. Sitanala Tangerang.

Metode: Penelitian menggunakan desain observasional analitik *cross-sectional* dengan teknik *consecutive sampling* terhadap 130 responden pasien operasi elektif dengan anestesi umum, terbagi merata menjadi dua kelompok: teknik *deep breathing* (n=65) dan tidal volume normal (n=65). Pengumpulan data dilakukan melalui observasi langsung nilai EtO₂ menggunakan monitor mesin anestesi GE Aisys CS2 pada periode 11 Maret– 11 April 2026, dan dianalisis menggunakan uji *Mann-Whitney U*.

Hasil: Hasil penelitian menunjukkan rata-rata nilai EtO₂ pada kelompok *deep breathing* sebesar $93,42 \pm 2,48\%$, lebih tinggi dibandingkan kelompok tidal volume normal sebesar $88,15 \pm 1,97\%$. Uji *Mann-Whitney* menunjukkan perbedaan bermakna antara kedua kelompok ($p < 0,001$).

Kesimpulan: Teknik *deep breathing* lebih efektif dalam meningkatkan kadar oksigen alveolar dan mencapai ambang preoksigenasi adekuat (EtO₂ $\geq 90\%$) dibandingkan tidal volume normal.

Kata kunci: preoksigenasi, end-tidal oksigen, *deep breathing*, tidal volume normal, anestesi umum

PREOXYGENATION TECHNIQUES ON END-TIDAL OXYGEN (EtO₂) VALUES IN GENERAL ANESTHESIA PATIENTS

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ABSTRACT

Background: General anesthesia is a medical procedure performed in more than 300 million patients annually worldwide, with a major risk of hypoxemia during the induction phase due to the pre-intubation apnea period. Preoxygenation is a crucial step to increase alveolar oxygen reserves; however, the selection of the most effective technique remains an evidence gap, particularly in comparing deep breathing and tidal volume normal techniques using End-Tidal O₂ (EtO₂) as an indicator.

Objective: This study aimed to analyze differences in EtO₂ values among general anesthesia patients based on preoxygenation techniques at RSUP dr. Sitanala Tangerang.

Methods: This study employed an analytical observational cross-sectional design using consecutive sampling involving 130 elective surgery patients under general anesthesia, equally divided into two groups: deep breathing (n=65) and tidal volume normal (n=65). Data were collected through direct observation of EtO₂ values using a GE Aisys CS2 anesthesia machine monitor from March 11 to April 11, 2026, and analyzed using the Mann–Whitney U test.

Results: The mean EtO₂ value in the deep breathing group was $93.42 \pm 2.48\%$, which was higher than that in the tidal volume normal group ($88.15 \pm 1.97\%$). The Mann–Whitney test showed a statistically significant difference between the two groups ($p < 0.001$).

Conclusion: The deep breathing technique is more effective in increasing alveolar oxygen levels and achieving adequate preoxygenation (EtO₂ $\geq 90\%$) compared to tidal volume normal.

Keywords: preoxygenation, end-tidal oxygen (EtO₂), deep breathing, tidal volume, general anesthesia