HUBUNGAN RASIO INSPIRASI–EKSPIRASI DENGAN NILAI *END-TIDAL* CO_2 INTRAOPERATIF PADA PASIEN ANESTESI UMUM DENGAN *ENDOTRACHEAL TUBE* (ETT)

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ABSTRAK

Latar Belakang: Pengaturan ventilasi mekanik selama anestesi umum berperan penting dalam mempertahankan ventilasi alveolar dan eliminasi karbon dioksida. Rasio inspirasi-ekspirasi merupakan salah satu parameter ventilasi yang dapat memengaruhi nilai *End-Tidal* CO_2 ($EtCO_2$). Namun, hasil penelitian sebelumnya mengenai hubungan rasio inspirasi-ekspirasi tersebut masih menunjukkan hasil yang beragam.
Tujuan: Mengetahui hubungan rasio inspirasi-ekspirasi dengan nilai End-Tidal CO_2 ($EtCO_2$) pada pasien anestesi umum dengan *Endotracheal Tube* (ETT) di RSUD Jenderal Ahmad Yani Kota Metro.
Metode: Penelitian kuantitatif observasional analitik dengan pendekatan *cross-sectional.* Variabel yang diamati meliputi rasio inspirasi-ekspirasi sebagai variabel bebas dan nilai $EtCO_2$ intraoperatif sebagai variabel terikat. Data diperoleh melalui observasi selama tindakan anestesi umum dan dianalisis menggunakan uji korelasi Pearson.
Hasil: Sebagian responden menggunakan rasio I:E 1:2 (50,0%) dan sebagian lainnya menggunakan rasio I:E 1:3 (50,0%). Rerata nilai $EtCO_2$ pada kelompok rasio I:E 1:2 sebesar 39,81 mmHg, lebih tinggi dibandingkan kelompok rasio I:E 1:3 sebesar 37,38 mmHg dengan selisih rerata 2,43 mmHg. Hasil uji korelasi Pearson menunjukkan nilai r = -0,650 dan *p-value* = 0,000 ($p<0,05$), yang menunjukkan hubungan negatif kuat dan signifikan antara rasio inspirasi-ekspirasi dan nilai $EtCO_2$.
Kesimpulan: Terdapat hubungan negatif yang kuat dan signifikan antara rasio inspirasi-ekspirasi dengan nilai $EtCO_2$ pada pasien anestesi umum dengan *Endotracheal Tube* (ETT). Semakin panjang fase ekspirasi, maka nilai $EtCO_2$ cenderung menurun.

Kata Kunci: ventilasi mekanik, kapnografi, ventilasi alveolar, *endotracheal tube*, anestesi umum.

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THE RELATIONSHIP BETWEEN THE INSPIRATORY - EXPIRATORY RATIO AND INTRAOPERATIVE *END - TIDAL* CO_2 LEVELS IN PATIENTS UNDERGOING GENERAL ANESTESIA WITH *ENDOTRACHEAL TUBE (*ETT)

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ABSTRACT

Background: Mechanical ventilation settings during general anesthesia play an important role in maintaining adequate alveolar ventilation and carbon dioxide elimination. The inspiratory-to-expiratory ratio is one of the ventilatory parameters that may influence *End-Tidal Carbon Dioxide* ($EtCO_2$) values. However, previous studies investigating the relationship between these variables have reported inconsistent findings.
Objective: To determine the relationship between the inspiratory-to-expiratory ratio and $EtCO_2$ values in patients undergoing general anesthesia with *Endotracheal Tube* (ETT) at Ahmad Yani Regional General Hospital, Metro City.
Methods: This quantitative analytical observational study employed a cross-sectional approach. The variables observed were the inspiratory-to-expiratory ratio as the independent variable and intraoperative $EtCO_2$ values as the dependent variable. Data were collected through intraoperative observation during general anesthesia and analyzed using the Pearson correlation test.
Results: Half of the respondents received an I:E ratio of 1:2 (50.0%), while the remaining half received an I:E ratio of 1:3 (50.0%). The mean $EtCO_2$ value in the I:E ratio 1:2 group was 39.81 mmHg, which was higher than that in the I:E ratio 1:3 group (37.38 mmHg), with a mean difference of 2.43 mmHg. Pearson correlation analysis revealed a correlation coefficient of $r = -0.650$ and a p-value of 0.000 ($p < 0.05$), indicating a strong and statistically significant negative correlation between the I:E ratio and $EtCO_2$ values.
Conclusion: There was a strong and statistically significant negative relationship between the inspiratory-to-expiratory ratio and $EtCO_2$ values in patients undergoing general anesthesia with ETT. A longer expiratory phase tended to be associated with lower $EtCO_2$ values.

Keywords: mechanical ventilation, capnography, alveolar ventilation, endotracheal tube, general anesthesia

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