Efek perbedaan volume tidal ventilasi mekanik perioperatif terhadap rasio PaO2/FiO2 pascaoperasi kraniotomi elektif = Effect of tidal volume in perioperative mechanical ventilation to postoperative PaO2/FiO2 ratio in elective craniotomy patients

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Abstrak

[ABSTRAK
Latar Belakang: Kraniotomi elektif memiliki insidens komplikasi paru pascaoperasi (25%) dan mortalitas (10%) yang tinggi. Pemakaian volume tidal rendah sebagai bagian dari teknik proteksi paru diketahui menurunkan komplikasi paru pascaoperasi. Penelitian ini berusaha mengetahui efek volume tidal 6 mL/kg dan 10 mL/kg terhadap rasio PaO2/FiO2 pascaoperasi pada kraniotomi elektif.
Metoda: Uji klinis acak ini dilakukan di satu rumah sakit pendidikan di Indonesia. Lima puluh dua pasien kraniotomi elektif (usia 18-60 tahun, durasi bedah >4 jam, paru normal) dirandomisasi ke dalam 2 kelompok intervensi: ventilasi mekanik perioperatif dengan volume tidal 6 mL/kg (VT-6) atau 10 mL/kg (VT-10). Hipotesis penelitian ini adalah rasio PaO2/FiO2 kelompok VT-6 lebih tinggi dibandingkan VT-10. Analisis gas darah dilakukan pada 1 jam pascainduksi, akhir operasi, 24 jam pascainduksi dan 48 jam pascainduksi. Komplikasi paru (atelektasis, pneumonia, ARDS, gagal napas) dan komplikasi ekstraparu (SIRS, sepsis, sepsis berat) diobservasi sampai hari ke-7 dan mortalitas pada hari ke-28.
Hasil: Rasio PaO2/FiO2 kelompok VT-6 dan VT-10 secara berurutan adalah: pada 1 jam pascainduksi adalah 413,7 ± 113,4 mmHg dan 401,5 ± 106,3 mmHg (p = 0,69); pada akhir operasi, 466,6 ± 94,6 mmHg dan 471,1 ± 89,0 mmHg (p = 0,86); pada 24 jam pascainduksi, 418,8 ± 108,8 mmHg dan 448,5 ± 119,6 mmHg (p = 0,35); pada 48 jam pascainduksi, 414,9 ± 88,1 mmHg dan 402,5 ± 100,7 mmHg (p = 0,63). Pneumonia ditemukan pada 1 pasien (3,8%) di kelompok VT-6 dan pada 2 pasien (7,6%) di kelompok VT-10. SIRS ditemukan pada 1 pasien (3,8%) di kelompok VT-6 dan pada 2 pasien (7,6%) di kelompok VT-10. Tidak ditemukan komplikasi paru/ekstraparu lain dan mortalitas dalam penelitian ini.
Simpulan: Ventilasi mekanik perioperatif dengan volume tidal 6 mL/kg tidak menghasilkan rasio PaO2/FiO2 yang lebih tinggi pada 1 jam pascainduksi, akhir operasi, 24 jam pascainduksi, dan 48 jam pascainduksi dibandingkan volume tidal 10 mL/kg pada pasien kraniotomi elektif dengan paru sehat. Insidens komplikasi paru/ekstraparu pascaoperasi dan mortalitas serupa di antara kedua kelompok.
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ABSTRACT
BACKGROUND: Elective craniotomy is associated with high incidence of postoperative pulmonary complications/PPC (25%) and mortality (10%). Low tidal volume as part of lung protective strategy is known to decrease PPC. We determined to study the effect of low tidal volume solely to postoperative PaO2/FiO2 ratio (PF ratio) in elective craniotomy.

METHODS: This was a randomised control trial in one university hospital in Indonesia. Fifty two patients underwent elective craniotomy (age 18-60 years, duration of surgery >4 hours, normal lung) were ventilated with tidal volume 6 mL/kg (VT-6) or 10 mL/kg (VT-10) perioperatively. We hypothesized that

postoperative PaO2/FiO2 ratio in VT-6 is higher than VT-10. Blood gas analysis were measured at 1 hour postinduction, at end of surgery, at 24 hours postinduction and 48 hours postinduction. Postoperative pulmonary complications (atelectasis, pneumonia, ARDS, respiratory failure) were observed on day 7 and mortality on day 28.
RESULTS: PaO2/FiO2 ratio of VT-6 and VT-10 respectively: at 1 hour postinduction, 413.7 ± 113.4 mmHg and 401.5 ± 106.3 mmHg (p = 0.69); at end of surgery, 466.6 ± 94.6 mmHg and 471.1 ± 89.0 mmHg (p = 0.86); at 24 hours postinduction, 418.8 ± 108.8 and 448.5 ± 119.6 mmHg (p = 0.35); at 48 hours postinduction, 414.9 ± 88.1 mmHg and 402.5 ± 100.7 mmHg (p = 0.63). Pneumonia were found in 1 (3.8%) patient in group VT-6 and 2 (7.6%) patients in group VT-10. SIRS were found in 1 (3.8%) in group VT-6 and 2 (7.6%) in group VT-10. No other pulmonary/extrapulmonary complications and mortality were found in this study.
CONCLUSION: Perioperative mechanical ventilation with lower tidal volume (6 mL/kg) does not result in higher postoperative PaO2/FiO2 ratio compared to higher tidal volume (10 mL/kg) in healthy lung patients undergone elective craniotomy. Incidence of postoperative pulmonary/extrapulmonary complications and mortality were similar between both groups. , BACKGROUND: Elective craniotomy is associated with high incidence of postoperative pulmonary complications/PPC (25%) and mortality (10%). Low tidal volume as part of lung protective strategy is known to decrease PPC. We determined to study the effect of low tidal volume solely to postoperative PaO2/FiO2 ratio (PF ratio) in elective craniotomy.

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