

# Pengaruh anestesi epidural torasik lidokain pada perfusi splanknik pasca-resusitasi renjatan perdarahan penelitian eksperimental pada *Macaca nemestrina*

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## Abstrak

### <b>ABSTRAK</b>

#### Latar belakang

Hipoperfusi splanknik tetap terjadi pada pasca-resusitasi renjatan perdarahan. Hipoperfusi splanknik dapat menimbulkan kerusakan mukosa usus, translokasi bakteri usus ke sistemik, dan kemungkinan gagal organ multipel. Tujuan penelitian ini adalah mempelajari pengaruh anestesi epidural torasik (AET) lidokain terhadap perubahan perfusi splanknik pasca-resusitasi renjatan perdarahan.

**Metode dan Bahan Penelitian** Suatu penelitian acak tersamar ganda dilakukan pada 16 ekor *Macaca nemestrina*, terdiri atas kelompok kontrol (n = 8) dan AET (n = 8). Kedua kelompok mendapat ketamin pada tahap persiapan, dan dilakukan pemasangan kateter epidural pada 17-8, selanjutnya diberikan anestesia umum. Renjatan perdarahan dicapai dengan cara darah dialirkan secara pasif keluar tubuh secara bertahap sehingga tekanan arteri rerata (TAR) 40 mm Hg dan dipertahankan selama 60 menit. Resusitasi dilakukan dengan cara darah dikembalikan disertai pemberian kristaloid. Pasca-resusitasi, kelompok AET mendapatkan lidokain 2% dan kontrol saline melalui kateter epidural. Pemantauan tekanan parsial CO<sub>2</sub> gaster (P<sub>g-a</sub>CO<sub>2</sub>), selisih tekanan CO<sub>2</sub> gaster - arteri [P(g-a)CO<sub>2</sub>], pH mukosa gaster (pHi), parameter hemodinamik, asam basa dan laktat darah dilakukan secara berkala. Kadar norepinefrin dan kortisol diukur pada menit 90, kultur darah, dilakukan pada saat prarenjatan dan menit 180, biopsi usus, hati dan ginjal dilakukan saat prarenjatan, menit 60, 90, dan 270 selama penelitian.

#### Hasil

Nilai P<sub>g</sub>CO<sub>2</sub> lebih rendah secara bermakna pada kelompok TEA pada menit ke-90 (11,0 (SD 8,0) vs. 19,0 (8,0) kPa; p=0,038), 150 (9,9 (8,-4) vs. (19,5 (8,6) kPa; p=0,023), dan pada akhir penelitian (270 menit) (10,1 (8,3) vs. 20,7 (10,0) kPa; p=0,041); di mana P(g-a) CO<sub>2</sub> lebih rendah pada kelompok TEA pada menit ke-150 dan 270; and pHi lebih rendah pada kelompok TEA pada menit ke-90 and 150. Parameter lain tidak menunjukkan perbedaan yang bermakna. Translokasi bakteri ditemukan lebih sedikit pada kelompok AET dari pada kontrol. Histopatologi duodenum kelompok AET lebih sedikit mengalami perburukan dari pada kontrol (p = 0,0456).

#### Kesimpulan

Perfusi splanknik kelompok AET pada pasca-resusitasi renjatan perdarahan lebih baik dari pada kontrol.

### <hr><i><b>ABSTRACT</b>

#### Background

Splanchnic hypoperfusion still exists despite of successful resuscitation of hemorrhagic shock. Studies have

shown that splanchnic hypoperfusion may lead to increased permeability of gastrointestinal mucosa, bacterial translocation, and increased risk of developing multiple organ failure. The aim of this study was to assess the effect of lidocaine thoracic epidural anesthesia (TEA) on splanchnic perfusion in post-resuscitation of hemorrhagic shock.

## Methods

This is a double blind randomized controlled study. Sixteen *Macaca nemestrina*s were randomly selected into two groups, i.e TEA group (n=8) and control (n=8). Both groups were anesthetized with ketamine during preparation, an epidural catheter was inserted at L7-S1, then were given the same anesthesia procedure. Hemorrhagic shock was induced by drawing blood gradually to a mean arterial pressure (MAP) of 40 mm Hg, and maintained for 60 minutes. Animals were then resuscitated by their own blood and crystalloid solution. Post resuscitation, the control group were given saline epidurally and the TEA group lidocaine 2%. During this study  $P_g\text{CO}_2$ ,  $P(g-a)\text{CO}_2$ ,  $p\text{H}_i$ , hemodynamic parameters, acid-base balance and lactate acid were monitored. Blood norepinephrine and cortisol concentrations were measured at 90 minute, blood sample at preshock and 180 minute were cultured and intestinal, liver, and kidney biopsies were done at preshock, 60 minute, 90 minute, and 270 minute during time of study.

## Results

Means of  $P_g\text{CO}_2$  were consistently significantly lower in the TEA group compared to control at 90 minute (11.0 (SD 8.0) vs. 19.0 (8.0) kPa;  $p=0.038$ ), 150 minute (9.9 (8.4) vs. (19.5 (8.6) kPa;  $p=0.023$ ), and at the end of this study (270 minute) (10.1 (8.3) vs. 20] (10.0) kPa;  $p=.041$ ); whereas  $P(g-a)\text{CO}_2$  were lower in TEA group at 150 and 270 minute and  $p\text{H}_i$  were lower in TEA group at 90 and 150 minute. Other parameters did not show significant difference between groups. Bacterial translocations were less in TEA group than in control group. Duodenum histopathology deterioration was less in the TEA group than in control ( $p = 0,0456$ ).

## Conclusion

Splanchnic perfusion in hemorrhagic shock post resuscitation in TEA lidocaine group as better than in control group.