

Effect of ulinastatin on microcirculation during sepsis in a rat cecal ligation and puncture model

X. Zhai¹, L. Jiang¹, Z. Yang^{1,2}, T. Yu^{1,2}, C. Wen¹, H. Zheng¹, J. Ornato^{2,4} and W. Tang^{1,2,3,4}

¹Sun Yat-sen Memorial Hospital, Sun Yat-sen University, Guangzhou, China ²Weil Institute of Emergency and Critical Care Research at VCU, VA ³Department of Internal Medicine and Emergency Medicine, VCU, VA ⁴Department of Emergency Medicine, VCU, VA



Background

Impairments of microcirculation are already present in the early stage of sepsis and are closely related to poor prognosis. Ulinastatin (UTI), a serine protease inhibitor, has been shown in both experimental and clinical studies to improve outcomes of sepsis. However, its effect on microcirculation during sepsis is unknown. In this study, we investigated the effect of UTI on microcirculation in a rat model of sepsis induced by cecal ligation and puncture (CLP). We hypothesize that UTI ameliorates microcirculation impairments in early stages of sepsis.

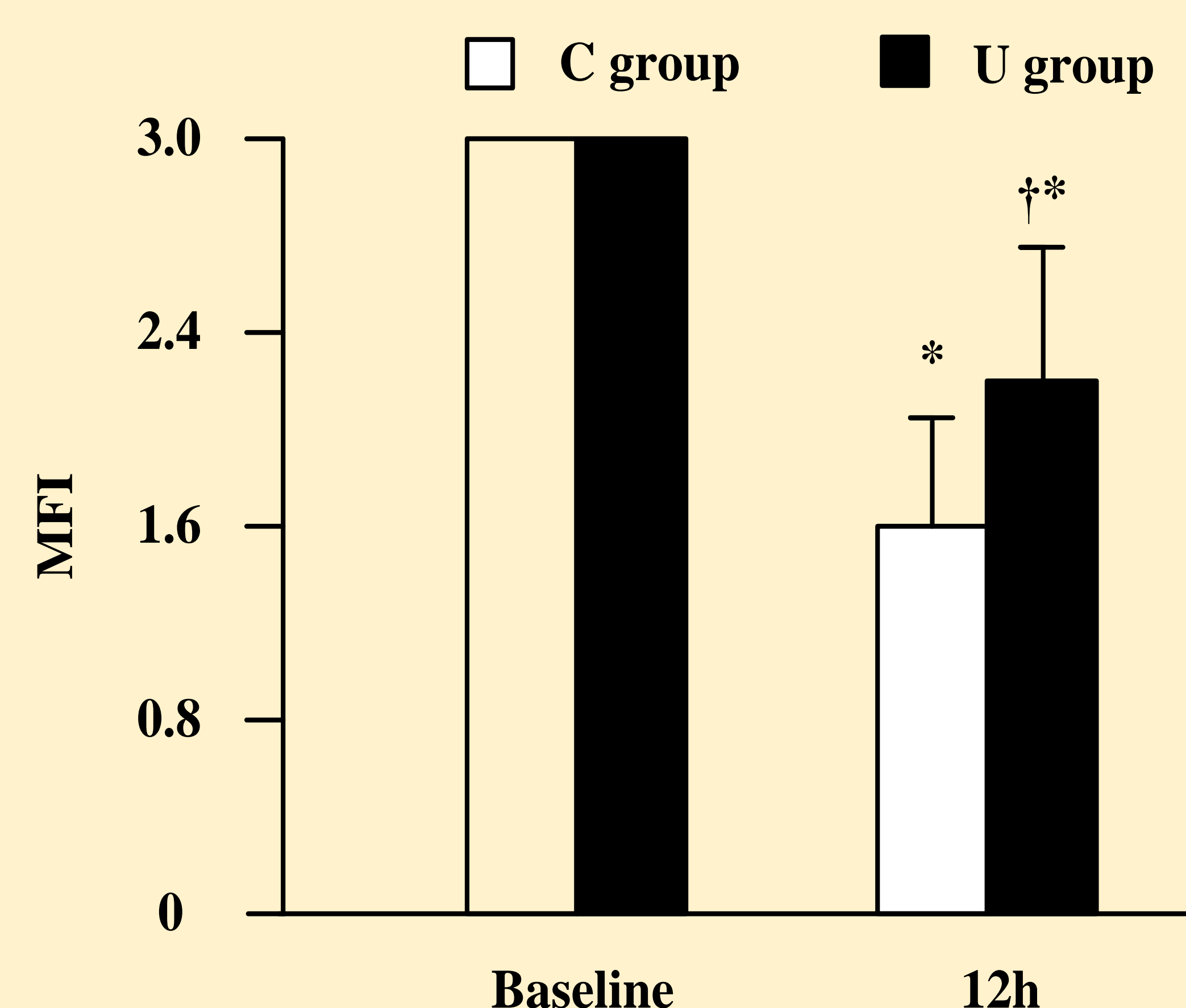
Methods

Twenty male Sprague-Dawley rats weighing between 500-550 g were randomized into 2 groups: CLP group (C group, n=10) and CLP+UTI group (U group, n=10). UTI (100,000 U/kg) or placebo was intraperitoneally injected at 2 and 6 hours after CLP, respectively. Sublingual microcirculation was measured by a sidestream dark-field imaging device at baseline and 12 hours after CLP. The survival time was analyzed for 96 hours.

Results

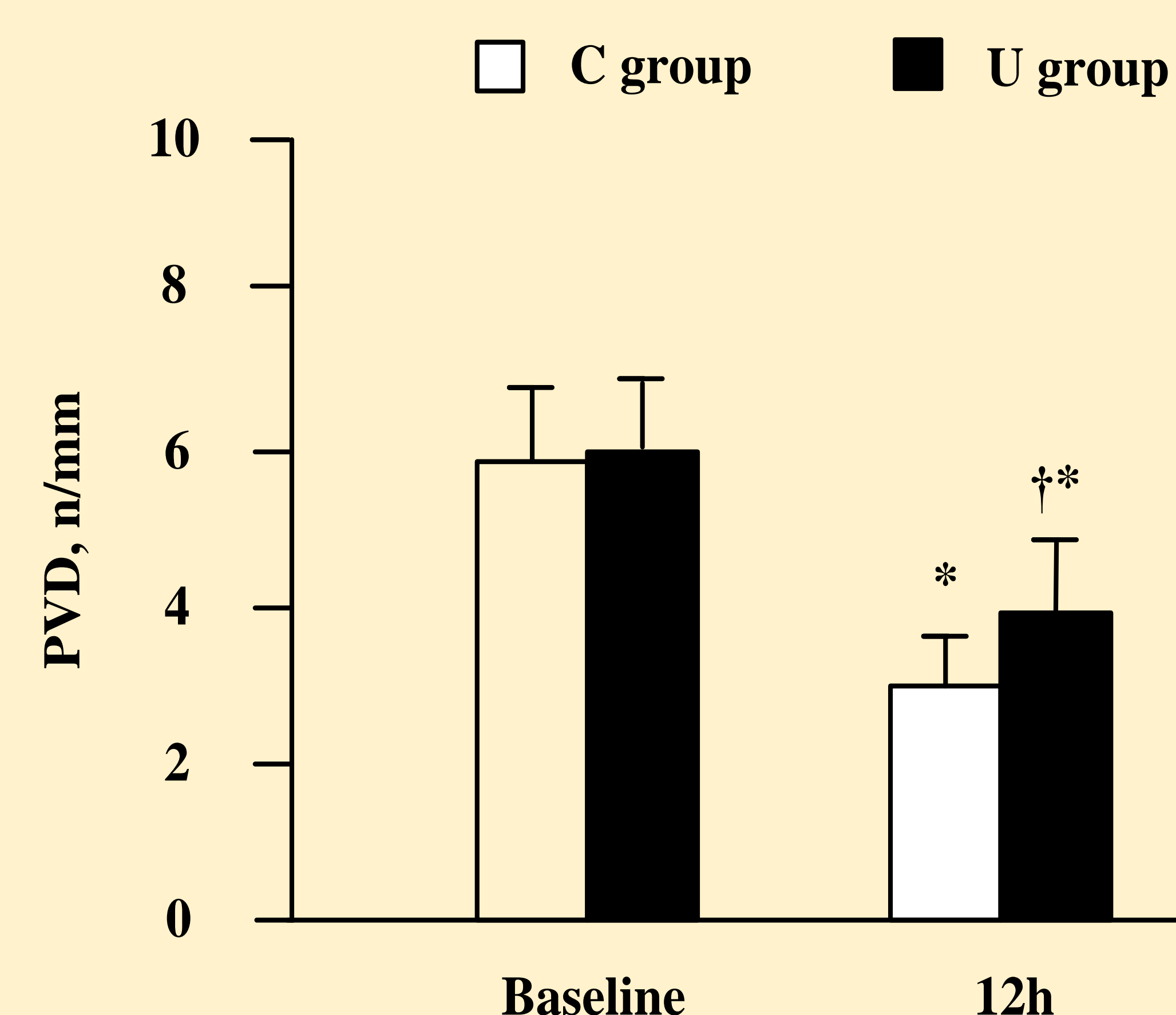
The sublingual microvascular flow index (MFI) and perfused vessel density (PVD) were greater after CLP in the U group than in the C group [(2.20±0.60) vs. (1.60±0.49); (3.82±0.46) vs. (2.92±0.69) n/mm, all $p < 0.05$]. The duration of survival of U group was greater than the Control group [(61.70±10.45) vs. (43.88±10.04) hours, $\chi^2=10.224$, $p < 0.05$].

Figure 1 Changes of sublingual micro-vascular flow index



MFI, micro-vascular flow index; C group, CLP group; U group, CLP+UTI group. * $p < 0.05$ vs. Baseline; † $p < 0.05$ vs. C group.

Figure 2 Changes of sublingual perfused vessel density



PVD, perfused vessel density; C group, CLP group; U group, CLP+UTI group. * $p < .05$ vs. Baseline. † $p < 0.05$ vs. C group.

Methods



Conclusions

UTI improves sublingual microcirculation during sepsis in a rat CLP model.

References

- Spanos A, Jhanji S, Vivian-Smith A, et al. Shock, 2010, 33(4):387-391.