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Comparison of Mean Arterial Pressure and Abdominal Perfusion Pressure for Organ Dysfunctions

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I read with interest the findings of the recent study by Ozkarakaş et al.,[1] published in this journal in August 2023. The study compares mean arterial pressure (MAP) with abdominal perfusion pressure (APP) in managing organ perfusion in sepsis. Organs necessitate adequate perfusion to maintain their functions. Various parameters are employed to estimate the adequacy of organ perfusion, especially in intensive care units. Sepsis and septic shock, accompanied by hypoperfusion, are conditions associated with high morbidity and mortality. They disrupt organ perfusion and lead to multiple organ failures if timely control is not provided. The Surviving Sepsis Campaign guideline recommends that the MAP for organ perfusion should be at least 65 mmHg. Perfusion pressure is also important for ensuring adequate perfusion of the target organ. Although the perfusion pressures of the end-organs differ substantially, maintaining them above 60 mmHg is generally crucial for the visceral organs. The comparison of these two values, both important for organ perfusion, renders this study valuable. This study underscores the importance of managing patients by maintaining APP at 60 mmHg with individual MAP settings. Such an approach proves to be superior to managing patients by maintaining MAP at 65 mmHg. This distinction is particularly relevant in sepsis due to increased intraabdominal pressure (IAP) for various reasons.

Elevated IAP results in congestion and deterioration of venous drainage within intraabdominal organs, exerting a detrimental impact on other body systems. In this study, the MAP 65 and APP 60 groups were compared by monitoring the renal perfusion. The kidneys face threat from both IAP elevation and sepsis. Sepsis-associated acute renal injury can stem from various causes. These include diminished global blood flow, tubular epithelial cell death, acute tubular necrosis, microcirculatory disorders, sepsis-associated microthrombi, damage induced by oxygen radicals, shunts, uncontrolled escalation of inflammatory markers, antibiotics, radiographic contrast agents used in imaging, and excessive fluid administration. These factors are often required in goal-oriented therapy and may contribute to an elevated IAP.

Could this be attributed to renal autoregulation, implying that adjusting individual MAP to target APP at 60 mmHg, rather than maintaining MAP at 65 mmHg for each individual, produces better results? Patients with chronic hypertension may require higher MAP levels for renal autoregulation. Hypertension shifts the renal blood flow-renal perfusion pressure curve to the right, and renal autoregulation requires higher threshold pressures in patients with hypertension.[2] As mentioned in the study, additional research is needed to understand how hypertension impacts renal injury.

In this study, maintaining a minimum MAP of 65 mmHg had prevented all patients from advancing to end-stage renal failure at the 90-day follow-up. While renal function was preserved in both groups, maintaining target perfusion pressure with individual MAP adjustment was significantly more valuable in preventing glomerular filtration rate decline. Maintaining an APP of 60 mmHg is sufficient for the kidney, or does the scenario differ at higher APP values? Gül et al.[3] conducted a study exploring the relationship between APP and the renal resistive index. Their findings revealed that an APP threshold of 72 mmHg was associated with a significant increase in the renal resistive index and impaired renal perfusion.

The need for high doses of vasopressors to maintain adequate perfusion pressure increased cardiac arrhythmias, although not statistically significant, as observed in this study. Nevertheless, there was no difference between the groups regarding 30- and 90-day mortality. Recent studies propose that APP is a superior indicator compared to MAP and lactate in discriminating survivors from non-survivors.[4]

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REFERENCES

1. Ozkarakaş H, Tekgül ZT, Arslan M, et al. Does Maintaining a Targeted Abdominal Perfusion Pressure Reduce Renal Damage in Patients with Septic Shock?: A Randomized, Controlled, and Open-label Study. *Balkan Med J*. 2023;40:415-421. [CrossRef]
2. Wronski T, Seeliger E, Persson PB, et al. The step response: a method to characterize mechanisms of renal blood flow autoregulation. *Am J Physiol Renal Physiol*. 2003;285:F758-764. [CrossRef]
3. Gül F, Sayan İ, Kasapoğlu US, et al. Abdominal perfusion pressure is superior from intra-abdominal pressure to detect deterioration of renal perfusion in critically Ill patients. *Ulus Travma Acil Cerrahi Derg*. 2019;25:561-566. [CrossRef]
4. Cheatham ML, White MW, Sagraves SG, Johnson JL, Block EF. Abdominal perfusion pressure: a superior parameter in the assessment of intra-abdominal hypertension. *J Trauma*. 2000;49(4):621-626; discussion 626-627. [CrossRef]