

THE ASSOCIATION BETWEEN URINARY OXYGEN TENSION AND MEAN ARTERIAL PRESSURE IN NON-CARDIAC SURGERY

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Background

- There is experimental and clinical evidence that renal tissue hypoxia occurs during major surgery, which may contribute to the development of acute kidney injury.
- Renal medullary hypoxia can now be assessed by continuous measurement of urinary oxygen tension (UPO_2) and UPO_2 is considered to be affected by mean arterial pressure (MAP).
- However, most clinical studies using UPO_2 was conducted in cardiac surgery that MAP changes substantially during surgery.

Objective

To investigate the correlation between MAP and UPO_2 in non-cardiac surgery.

Methods

- Twelve adult patients, head and neck cancer surgery
- Osaka university hospital, between July 2021 and March 2022
- Approval number: 20536
- UPO_2 measured via an oxygen-sensing probe in the tip of the urinary catheter (Figure).
- MAP were recorded minutely from the induction of general anesthesia to the extraction of oxygen-sensing probe.



1. We categorized MAP for 4 groups, MAP <60, 60-79, 80-99, 100≤ and compared UPO_2 for each group.
2. We investigated the effect of intravenous bolus administration of vasopressor (phenylephrine 0.1mg) on UPO_2 in patients that MAP increased respond to phenylephrine.

Results

Figure. 1: UPO_2 was significantly increased in proportion to MAP ($P = 0.004$)

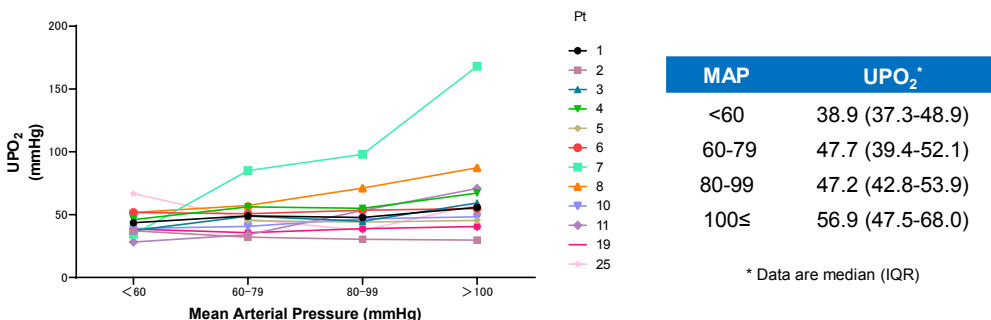
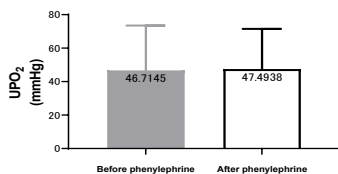


Figure. 2: Effect of phenylephrine on UPO_2



- There were 47 episodes of intravenous phenylephrine.
- Compared UPO_2 data 5 minutes prior to 15 minutes after phenylephrine injection.
- MAP was 60.8 (9.2) mmHg and significantly increased to 65.7 (14.1) after phenylephrine injection ($P = 0.04$).
- Data are mean (SD)

Conclusions

- In non-cardiac surgery, UPO_2 was significantly increased in proportion to MAP.
- UPO_2 was not significantly increased after bolus administration of phenylephrine despite rise of MAP.



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