

# INCIDENCE, RISK FACTORS AND OUTCOMES OF AKI IN PATIENTS UNDERGOING ELECTIVE OESOPHAGEAL ONCOLOGICAL SURGERY

Simoni Caterina <sup>a\*</sup> Antonelli Alessio <sup>a</sup> Feltracco Paolo <sup>a</sup> Valmasoni Michele <sup>b</sup> Merigliano Stefano <sup>b</sup> Navalesi Paolo <sup>a</sup> Godi Ilaria <sup>c</sup>

<sup>a</sup> Section of Anesthesiology and Intensive Care, Department of Medicine - DIMED, Università degli studi di Padova, Padova, Italy.

<sup>b</sup> Department of Surgical, Oncological and Gastroenterological Sciences, Università degli studi di Padova, Clinica Chirurgica 3, Padova, Italy.

<sup>c</sup> Department of Anesthesia and Intensive Care Unit, Azienda Ospedale Università di Padova, Padova, Italy

## BACKGROUND

Esophagectomy is a major surgery, which exposes the patients at higher risk of intra- and post-surgical complications. Particularly, acute kidney injury (AKI) has been increasingly recognized as a common postoperative complication, with significant impact on morbidity and mortality. Only few studies have deepened the incidence, predictive factors and impact on morbidity and mortality of AKI in patients underwent esophagectomy. This study aims to enrich this void, establishing the incidence of postoperative AKI and identify any possible predictive factors or associations with pulmonary, cardiovascular, septic and post-surgery comorbidities as well as mortality and the correlation between these and the length of stay in hospital.

## RESULTS

A total of 154 patients were recruited, of which 8 were excluded, for a final number of 146 patients included in this analysis.

The incidence of AKI was 30.8%. Among them, 88,9% of patients were classified as AKI I stage, 11,1% as II stage and no cases were registered as AKI III stage. After 7 days since AKI diagnosis 13,3% developed AKD. None of them received renal replacement therapy.

Patients who developed postoperative AKI were older and had higher BMI. Univariate analysis recognized age, BMI and the intra-operative use of non-steroidal anti-inflammatory drugs as predictive for AKI, but the multivariate analysis determined that the only factors independently associated with postoperative AKI was the intra-operative use of nonsteroidal anti-inflammatory drugs (OR 2.34; 95% CI 1.08-5.05). There were no differences between patients who developed AKI and patients who didn't, in terms of pulmonary, surgical and septic complications as well as length of intensive care unit or hospital stay, while postoperative AKI was found to be associated with a three-fold increase in the risk of major adverse postoperative cardiac events (OR 3,2 IC95% 1,1-9,3, p-value=0,03).

|                                | Univariate analysis |            |         | Multivariable analysis |           |         |
|--------------------------------|---------------------|------------|---------|------------------------|-----------|---------|
|                                | OR                  | 95% CI     | p-value | OR                     | 95% CI    | p-value |
| Arrhythmia (Yes/No)            | 3,53                | 0.57-21.94 | 0.17*   |                        |           |         |
| End surgery diuresis (ml/kg/h) | 0,71                | 0.46-1.12  | 0.14*   |                        |           |         |
| End surgery NSAIDs (Yes/No)    | 2,14                | 1.02-4.5   | 0.045*  | 2,34                   | 1.08-5.05 | 0.03*   |
| Ranitidine (mg)                | 0,53                | 0.26-1.08  | 0.08*   |                        |           |         |
| Age (year)                     | 1,03                | 0.99-1.06  | 0.09*   | 1,03                   | 0.99-1.06 | 0,088   |
| BMI (kg/m <sup>2</sup> )       | 1,07                | 0.99-1.17  | 0.09*   | 1,08                   | 0.99-1.18 | 0,099   |

Figure 2: Predictive risk factors for postoperative AKI

## METHODS

This is a preliminary analysis of a retrospective monocentric observational study on postoperative AKI in patients undergoing elective esophageal cancer surgery at Clinica Chirurgica 3 of the Azienda Ospedaliera Universitaria di Padova, Italy. Registration number NCT04773080.

AKI was defined according to Kidney Disease Improving Global Outcomes criteria within 48 hours after surgery. We also considered, as defined by the European Perioperative Clinical Outcome, lung, surgical, septic complications and major adverse cardiovascular events within a 30 days period following surgery, as well as length of stay and the mortality during the hospitalization.

Independent predictive factors have been identified through multivariate logistic regression analysis.

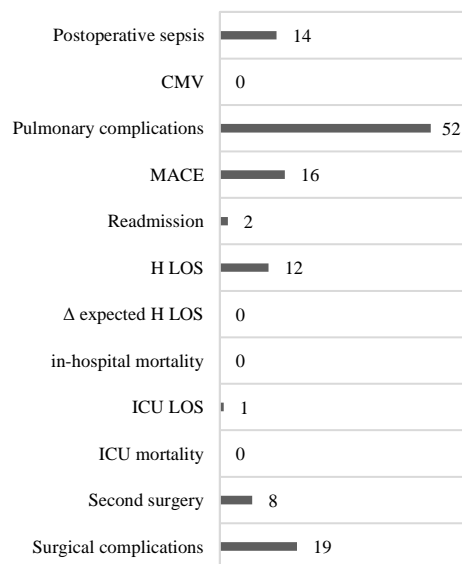


Figure 1: Postoperative outcomes

## CONCLUSIONS

Postoperative AKI was a frequent complication in patients undergoing elective oesophageal cancer surgery. With the limitation of a preliminary analysis, among preoperative and intraoperative factors, the use of nonsteroidal inflammatory drugs was the only independently associated with AKI. Although AKI did not lead to an increase of length of stay in hospital or an increased risk of pulmonary, septic or surgical complications, it was associated with an increased risk of major adverse postoperative cardiac events.