Effects Of Renal Dysfunction On Mortality After Endovascular Aortic Repair

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Background

- Endovascular aortic aneurysm repair (EVAR) lower perioperative morbidity and mortality compared to open repair (OAR)
- Previous literature reports the incidence of acute kidney injury (AKI) after EVAR as 3%-19%
- Chronic kidney disease (CKD) is a well-known risk factor in EVAR due to contrast media use and arterial manipulation
- Rates of CKD progression up to three years after EVAR range from 25% to 36%

Objectives

Examine the impacts of perioperative CKD and AKI on mortality and renal disease progression in patients undergoing endovascular repair of the abdominal (EVAR) and thoracic aorta (TEVAR).

Methods and Materials

Data collection: retrospective chart review at the UCI Medical Center from 2012-2021

Inclusion: ≥ 18 -years-old EVAR or TEVAR patients
Exclusion: Inadequate information in medical record

Primary outcome: Mortality
Short term (30-day) and long term (>30 days)
Secondary outcome: Postoperative AKI, CKD progression

Methods and Materials (cont.)

Compared patients with and without preoperative CKD stages 3-5

Kaplan-Meier survival curves applied to assess patient survival over time stratified by CKD stages 3,4, and 5 and postoperative AKI

Univariable logistic regression for risk of 30-day and long-term mortality with the presence of preoperative CKD and postoperative AKI

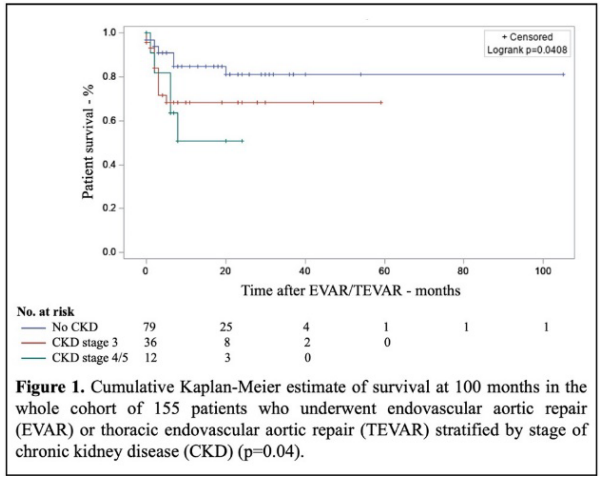

Figure 1. Cumulative Kaplan-Meier estimate of survival at 100 months in the whole cohort of 155 patients who underwent endovascular aortic repair (EVAR) or thoracic endovascular aortic repair (TEVAR) stratified by stage of chronic kidney disease (CKD) (p=0.04).

Table 1. Univariable analysis of mortality risk with postoperative AKI

Outcome	OR	CI
30-Day Mortality	7.33	2.16-24.9
Long-term Mortality	3.55	1.57-8.06

Results

- Of 155 total patients, 62 (40%) had preoperative CKD stages 3-5
- Postoperative AKI rate higher for patients with preoperative CKD (32.3% vs. 18.3%, p=0.045)
- Preop CKD was associated with no difference in 30-day mortality (p>0.05), but higher long-term mortality (30.6% vs. 16.1%, p=0.003) and doubled mortality risk (OR=2.30, CI 1.06 - 4.98) after EVAR/TEVAR
- Postoperative AKI associated with increased 30-day *and* long-term mortality risk
- More advanced preoperative CKD associated with worse long-term survival postop
  Mean follow-up time: 10.5 (0-105) months

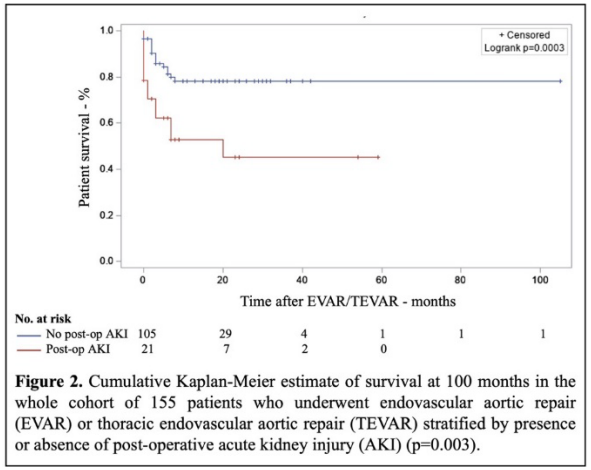

Figure 2. Cumulative Kaplan-Meier estimate of survival at 100 months in the whole cohort of 155 patients who underwent endovascular aortic repair (EVAR) or thoracic endovascular aortic repair (TEVAR) stratified by presence or absence of post-operative acute kidney injury (AKI) (p=0.003).

Discussion

- CKD is associated with worse long term survival after EVAR/TEVAR
- Post operative AKI is associated with higher mortality
- Progression of renal dysfunction occurred independent of volume of intraoperative contrast administered
- Limitations: selection bias, single-institution study, small sample size, possible confounding factors such as preoperative anemia, medications (ie diuretics)

Conclusions

This single institution study spanning ten years of data demonstrated that perioperative renal dysfunction is a strong predictor of short-term and long-term mortality after EVAR/TEVAR.

This data can be used for better informed patient counseling and risk stratification for EVAR/TEVAR.

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