

Incidence and risk factors for acute kidney injury in patients with cardiac implantable electronic devices undergoing transvenous lead removal

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Purpose

Acute kidney injury (AKI) is a common complication in the treatment of patients undergoing cardiac implantable electronic device (CIED) and may lead to poorer clinical outcome. Our aim was to investigate the incidence of AKI and to identify potential risk factors for AKI in patients with CIED admitted for transvenous lead removal.

Methods

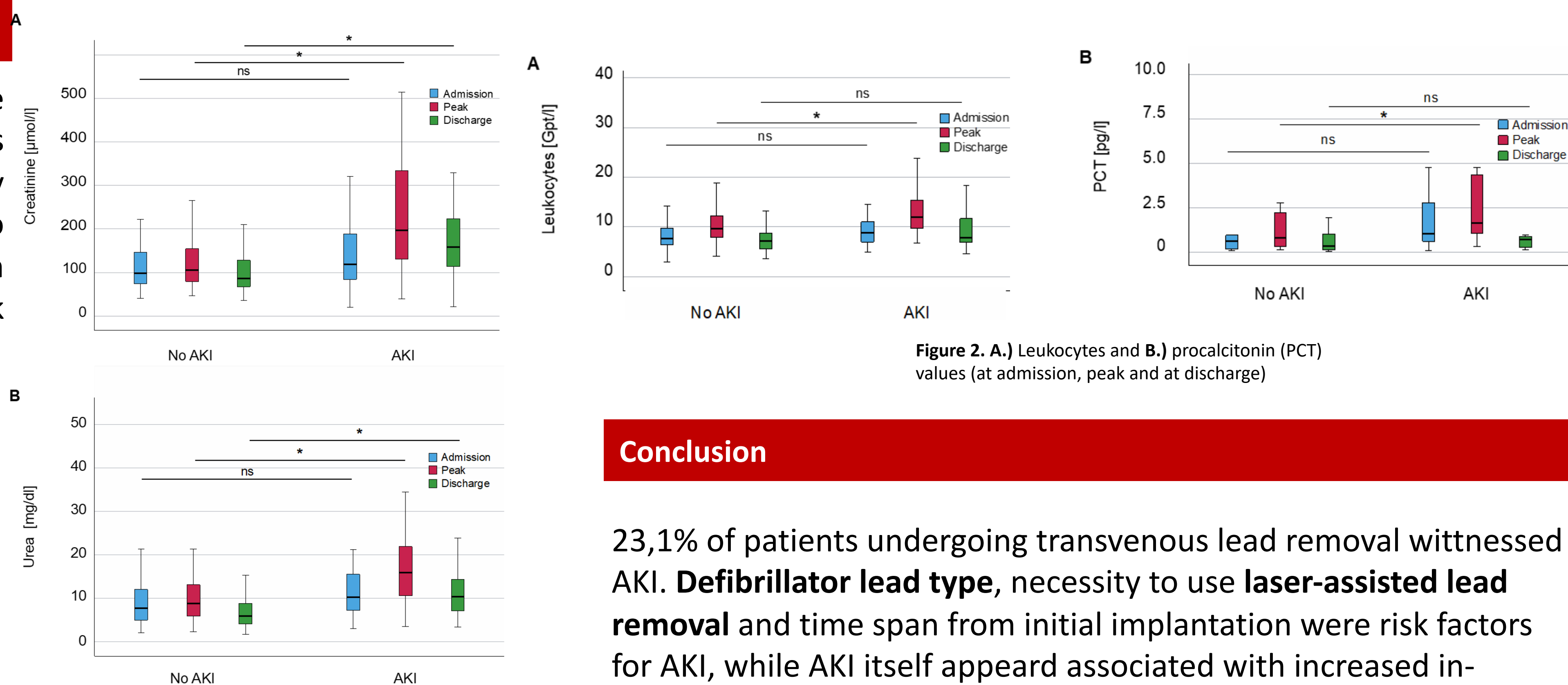
In our current observational cohort study, we analyzed data from 147 consecutive patients undergoing transvenous lead removal. Primary endpoint was the occurrence of AKI according to KDIGO criteria. Multivariable logistic regression analysis was performed to identify independent risk factors for AKI.

	No AKI (n = 113)	AKI (n = 34)	P- value
Age [years]	72.5 ± 11.8	72.4 ± 11.6	0.948
Male [n (%)]	82 (72.6)	22 (64.7)	0.395
BMI [kg/m ²]	29.2 ± 11.2	30.6 ± 6.5	0.483
CKD [n (%)]	52 (46.0)	19 (55.9)	0.409
eGFR [ml/min]	63.5 IQR 47.3	56.5 IQR 35.75	0.799
Hypertension [n (%)]	90 (79.5)	26 (76.5)	0.819
Type 2 diabetes [n (%)]	48 (42.5)	20 (58.8)	0.777
COPD [n (%)]	19 (16.8)	8 (23.5)	0.848
CAD [n (%)]	65 (57.5)	20 (57.6)	0.992
LV EF [%]	43.6 ± 13.2	37.3 ± 14.5	0.018*
Previous valve replacement or reconstruction [n (%)]	18 (15.9)	5 (14.3)	0.855
Previous endocarditis [n (%)]	2 (1.8)	0 (0.0)	0.542

Table 1. Patients' characteristics

Results

Indications for lead removal were as follows: **isolated pocket infection (34.7 %)**, **systemic infection (49.3%)**, **pocket or lead perforation without infection (13.9 %)** and **endocarditis (2.1 %)**. 34 out of 147 patients (23.1%) witnessed AKI (82.4 % stage 1, 8.8 % stage 2 and 8.8 % stage 3). In-hospital mortality occurred in 8.2 %. ICD-lead type (HR 24.55, CI 2.41 – 249.97, p = 0.007), necessity to use laser-assisted lead removal (HR 5.41, CI 1.12 – 26.13, p = 0.035) and time span since initial implantation (HR 1.01, CI 1.00 – 1.02, p = 0.013) appeared to be independent risk factors for AKI. Moreover, the occurrence AKI was independently associated with in-hospital mortality (HR 8.439, CI 2.08 – 34.33, p = 0.003).



Conclusion

23,1% of patients undergoing transvenous lead removal witnessed AKI. **Defibrillator lead type**, necessity to use **laser-assisted lead removal** and time span from initial implantation were risk factors for AKI, while AKI itself appeared associated with increased in-hospital mortality.