PROGNOSTIC VALUE OF ACUTE-ON-CHRONIC KIDNEY INJURY IN PATIENTS WITH DECOMPENSATED HEART FAILURE

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Background and Objective

- Acute kidney injury (AKI) is an independent risk factor for adverse outcomes in acute decompensated heart failure (ADHF)[1,2]
- AKI occurs as a consequence of new onset kidney injury (AKI de novo) or acute deterioration of pre-existed chronic kidney disease (CKD) (AKI on CKD)[3]
- The aim of the study was to determine the prevalence of different variants of AKI in ADHF patients and to evaluate the impact on short-term (30-days mortality) and long-term (rate of ADHF rehospitalizations during 6 months) outcomes.

Inclusion criteria

- Patients hospitalized with ADHF
- Age 45-80 years

AKI criteria

- Increase in SCr ≥ 0.3 mg/dl (≥ 26.5 μmol/l) within 48 hours; or
- Increase in SCr ≥ 1.5 times baseline within the prior 7 days
- If SCr decreased during hospitalization, it was considered transient AKI

[1] Adams K., Fonarow G.C., Emerman C. et al. Am. Heart. J. – 2005; 149:209-216.
[2] Ronco C., Cicoira M., McCullough P.A. J Am Coll Cardiol 2012; 60: 1031–42
[3] Zhou Q., Zhao C., Xin D. et al. BMC Nephrol. 2012;13:51. doi: 10.1186/1471-2369-13-51.
[4] KDIGO Clinical practice guideline for acute kidney injury. Kidney Int. 2012; 2(1): 1–141

Methods

- Detection and classification of AKI:
  - ✓ KDIGO Guidelines 2012[4]
- Depending on the presence of known CKD AKI was divided:
  - ✓ AKI de novo
  - ✓ AKI on CKD

Study population (n=183)

Parameters	Value
Male, n (%)	125 (68.3)
Age, years (M SD)	68.9±9.4
Arterial hypertension, n (%)	159 (86.9)
Ischemic heart disease, n (%)	102 (55.7)
Myocardial infarction, n (%)	97 (53)
Atrial fibrillation, n (%)	94 (51.4)
Diabetes mellitus, n (%)	66 (36.1)
Known chronic kidney disease, n (%)	103 (56.3)
Ejection fraction, %	44±15

Results

- 41% of patients developed AKI (Fig. 1)
- In 63% AKI developed among patients with pre-existed CKD (Fig. 2)
- Patients with «AKI on CKD» versus patients «AKI de novo» had greater duration of CHF, higher prevalence of ischemic heart disease, arterial hypertension, myocardial infarction, diabetes mellitus, anemia, higher rate of prior HF hospitalizations (Tabl. 1)
- «AKI on CKD» versus «AKI de novo» tended to develop in the later periods of hospitalization (4.2 3.8 vs 3.0 2.3 days, p >0.05), less often was transient (45 vs 71%, p<0.01), had lower risk of 30-days mortality (11 vs 29%, p <0.05) and higher rate of ADHF rehospitalizations during 6 months (60 vs 29%, p<0.01) (Fig. 3)

Figure 1. Prevalence of AKI in patients with ADHF

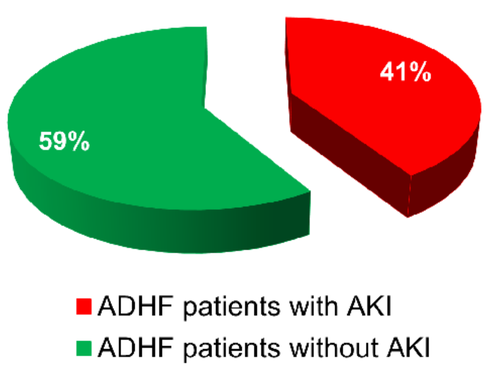


Figure 2. Clinical variants of AKI according to presence of known CKD

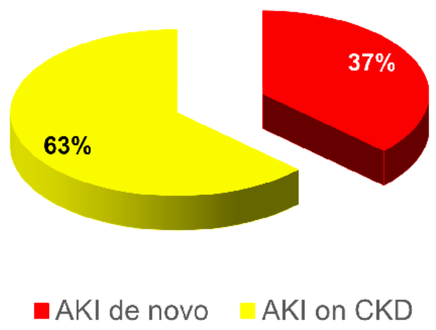
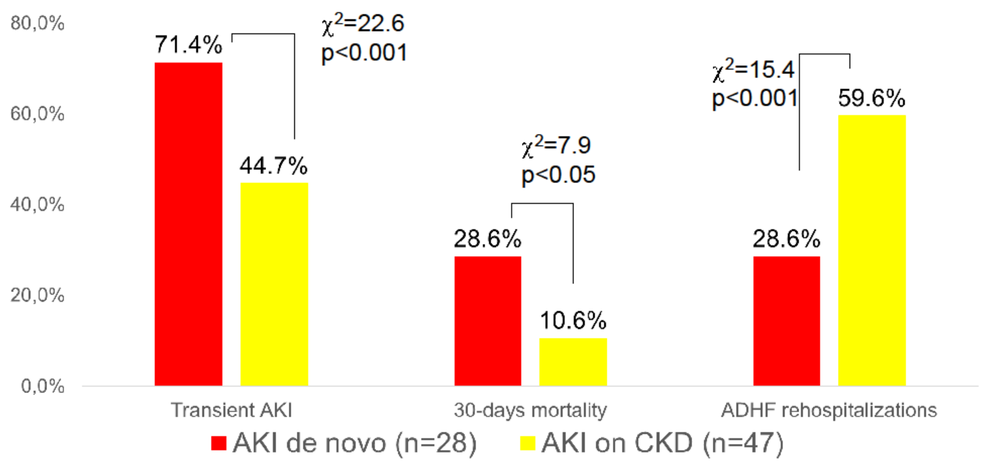


Table 1. Renal function, uNGAL and KIM-1 in patients according to presence of AKI

Parameters	AKI de novo (n=28)	AKI on CKD (n=47)
Duration of CHF, years (M±SD)	2.3±1.5	4,2±1.7**
Rate of prior HF hospitalizations, n (%)	16 (57.1)	47 (100)***
Arterial hypertension, n (%)	20 (71.4)	47 (100)**
Ischemic heart disease, n (%)	8 (28.6)	30 (63.8)**
Myocardial infarction, n (%)	8 (28.6)	25 (53.2)**
Diabetes mellitus, n (%)	4 (14.8)	26 (55.3)**
Anemia, n (%)	0 (0)	25 (53.2)***

**p <0.01, ***p<0.001, compared to patients with AKI de novo

Figure 2. Outcomes of AKI according to presence of known CKD



Conclusions

- ✓ «AKI on CKD» was more frequent in ADHF patients and developed in 63%
- ✓ Patients with «AKI on CKD» were at greatest risk of adverse long-term outcomes in ADHF
- ✓ Development of «AKI on CKD» was not associated with higher risk of 30-days mortality

Disclosure: none

DOI: 10.3252/pso.eu.51era.2014
Poster presented at: 51 ERA-EDTA CONGRESS AMSTERDAM 2014
PosterSessionOnline.com