RENAL RECOVERY AFTER ACUTE KIDNEY INJURY DETECT-H PROJECT

González Sanchidrián S, Labrador Gómez PJ, Jiménez Herrero MC, Polanco Candelario S, Davin Carrero E, Piquero Calleja L, Marín Álvarez JP, Sánchez Montalbán JM, Deira Lorenzo J, Gómez-Martino Arroyo JR.

Nephrology Unit. Hospital San Pedro de Alcántara. Cáceres, Spain

INTRODUCTION AND OBJECTIVES

Acute kidney injury (AKI) is a common problem in-hospital patients. AKI is associated with higher mortality and length of stay (LOS), and chronic kidney disease (CKD) progression.

The aim of our study was to analyse the prevalence of acute kidney injury in our hospital, length of stay, in-hospital mortality and renal recovery.

METHODS

Our hospital provides services for 192.290 residents and specialist services to 404.517 from neighbouring areas, with 520 inpatients beds. We developed a fully automated, electronic alert system which identifies all cases of reduced estimated glomerular filtration rate (eGFR) according to CKD-EPI equation in patients over 14 years.

We established two levels of alert: eGFR<60 mL/min/1.73m2 or <30 mL/min/1.73m2 for patients older than 80 years. All episodes of patients with decreased eGFR since admission date and during the hospitalization period are studied and staged. All serum creatinine (sCr) measurements were recorded.
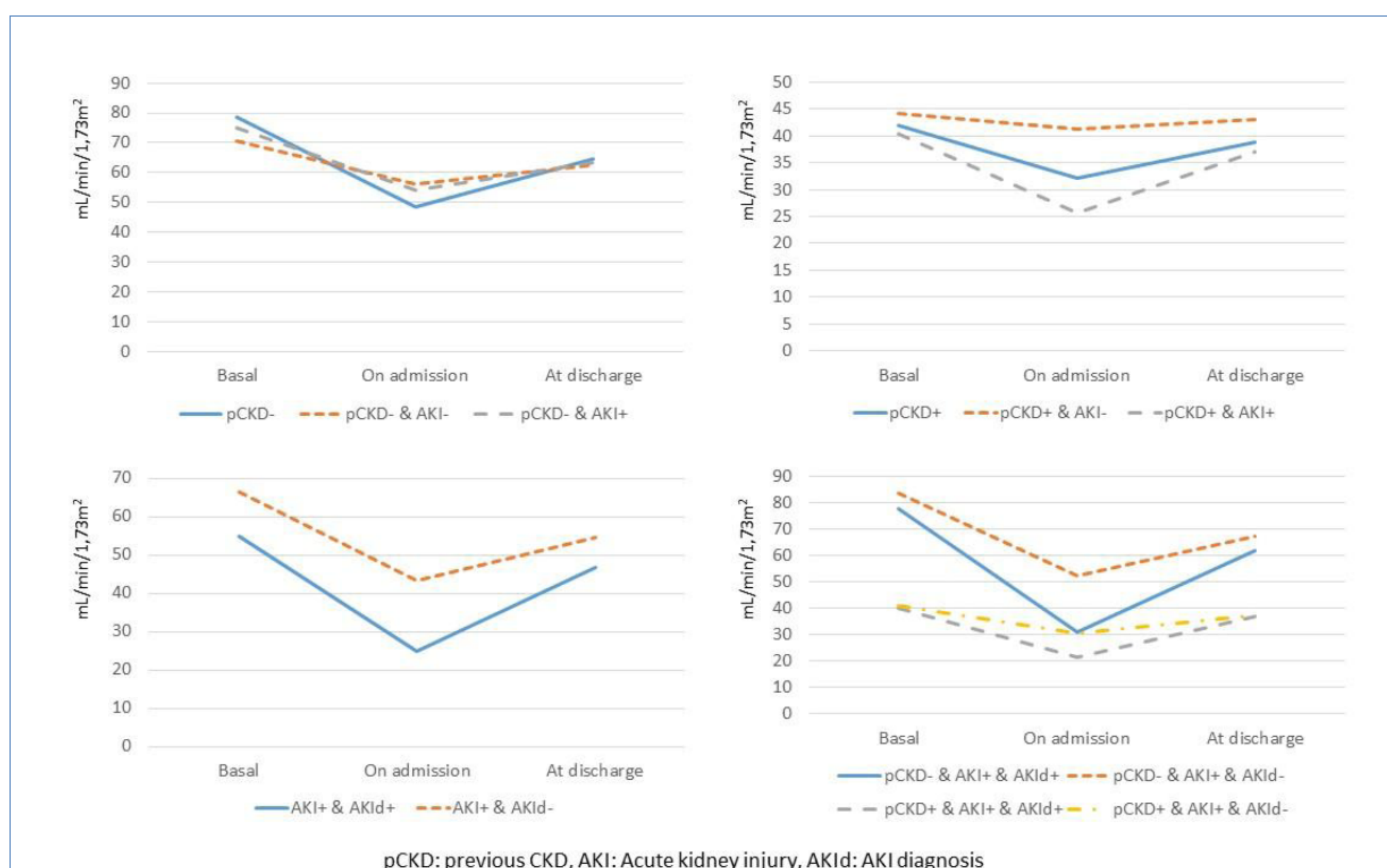
AKI or CKD was established according to Kidney Disease: Improving Global Outcomes (KDIGO) guidelines.

Patients admitted in nephrology unit or chronic dialysis patients were excluded.

Baseline sCr was considered the lowest level between 0.5-6 months before admission. In the absence of a baseline sCr, lowest in-hospital sCr was considered. The peak sCr was the highest sCr within the episode. Length of stay and in-hospital mortality was recorded.

RESULTS

Between January and June 2014, 11.022 completed adult patient admission episodes occurred. The number of alerts issued was 1.241 (11.3% of admissions), from 1.079 patients (13.1% multiple admissions). Median age was 77 years (interquartile range (IQR) first and third quartiles 70-81), and 53.9% were men.

pCKD: previous CKD, AKI: Acute kidney injury, AKId: AKI diagnosis

Figure 1. Renal recovery. Evolution of eGFR in AKI and CKD.

▪ Renal function before admission was present in 1.042 patients (84%). Stage 1 9.6%, stage 2 37.7%, stage 3a 25%, stage 3b 17.7%, stage 4 9.1%, and stage 5 0.9%.

▪ AKI was present in 846 admission episodes (68.2% of alerts and 7.7% of total admissions). The proportion of admission episodes generating an AKI alert with highest stages 1, 2 and 3, respectively was 421 (49.8%), 207 (24.5%) and 218 (25.8%).

▪ Mortality in detected patients by alert was 14.9% (185 patients), according AKI stages: 10.9%, 22.7% and 33.9% in AKI 1, 2 and 3 respectively; 57.1% in patients with AKI stage 3 requiring dialysis; 4.3% in renal dysfunction without AKI criteria; p<0.001.

▪ Diagnosis of AKI as main event was reflected at discharge in 33.2% of patients who met AKI criteria, and 45.3% AKI episodes were recognized during the hospitalization, in stage 1: 30.4%, stage 2: 47.8% and stage 3: 71.6%. AKI was recognized more often by the physician when eGFR was lower; p<0.001.

▪ When renal dysfunction is identified, renal recovery is higher in CKD and AKI patients. Figure 1.

CONCLUSIONS

Electronic alerts is an effective tool to detect in-hospital renal dysfunction patients. Renal dysfunction prevalence was over 10% in-hospital admissions and AKI prevalence out of nephrology unit was 7.7%.

AKI is under-recognized and is associated with a poor in-hospital prognostic; in-hospital AKI was recognized in less than a half of episodes. Renal recovery is higher when renal dysfunction is diagnosed.

• Heung M, Steffick DE, Zivin K, Gillespie BW, Benerjee T, Hsu C et al. Acute kidney injury recovery pattern and subsequent risk of CKD: An analysis of Veterans Health administration data. Am J Kidney Dis. 2016; 67(5): 742-752.
• Susantitaphong P, Cruz DN, Cerda J, Abulfaraj M, Algahtani F, Koulouridis I et al. Worl incidence of AKI: a meta-analysis. Clin J Am Soc Nephrol. 2013; 8: 1482-1493.
• Hoste EA, Schurges M. Epidemiology of acute kidney injury: how big is the problem? Crit Care Med. 2008; 36 (suppl 4): S146—S151.
• Porter CJ, Juurlink I, Bisset L, Bavakunji R, Mehta R, Devonald MAJ. A real-time electronic alert to improve detection of acute kidney injury in a large teaching hospital. Nephrol Dial Transplant. 2014; 29: 1888-1893.
• Sawhney S, Fluck N, Marks A, Prescott G, Simpson W, Tomlison L et al. How does automated detection perform? Nephrol Dial Transplant. 2015; 30 (11): 1853-1861.