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Time-trend of post-operative acute kidney injury from a multicenter cohort study.

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Objectives: After emphasis on prevention and early recognition of acute kidney injury (AKI) from the KDIGO 2012 AKI guideline, in-hospital AKI occurrence had reduced during the past two decades. However, understanding the time trend of post-operative AKI (PO-AKI) is lacking yet.

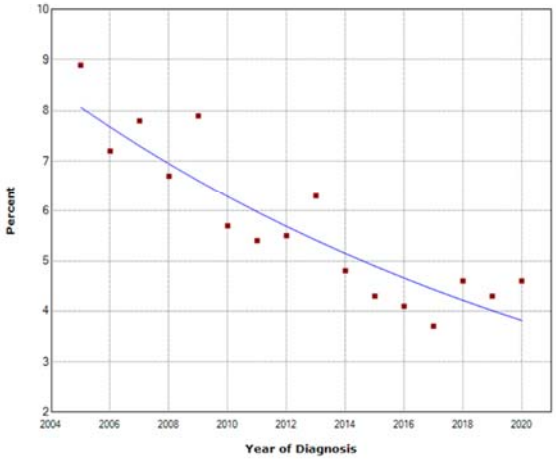
Methods: A retrospective cohort study was performed at three referral hospitals from 2005 to 2020. The patients who underwent non-cardiac major surgery having more than 1 hour of operation time at 5 departments including general surgery, gynecology, urology, neurosurgery, and orthopedic surgery were enrolled. PO-AKI was defined as KDIGO AKI criteria within 7 days after surgery. Severe PO-AKI (S-PO-AKI) was defined as stage 2 or 3 AKI. The time period was divided into 3-year intervals and evaluated by join-point regression analysis and multivariate logistic regression.

Results: A total of 171,273 patients were included. During the study period, 9,035 (5.3%) PO-AKI and 1243 (0.7%) S-PO-AKI occurred. The patients were older and more women. They had more comorbidities including diabetes mellitus (5.6% → 15.7%), hypertension (12.4% → 31.5%), coronary artery disease (1.9% → 4.4%) as times go by. Surgery duration tended to be reduced recently. Preoperative nonsteroidal anti-inflammatory drug usage was decreased whereas diuretics and renin-angiotensin-aldosterone system blockades uses were increased with time. The PO-AKI incidence had decreased from 8.9 % in 2014 to 4.6% in 2020. In join-point analysis, PO-AKI incidence decreased with annual percent change (APC) of -4.9 % per year (95% confidence interval [CI] -6.2% – -3.5%, *p*-value <0.001), Although, S-PO-AKI was not (APC -0.3%, 95% CI -2.1 – 1.5%, *p*-value = 0.732, Figure 1). These trends were remained similarly after adjustment with age, sex, co-morbidities, blood pressure, serum albumin, serum sodium, dipstick albuminuria, and perioperative nephrotoxic drugs.

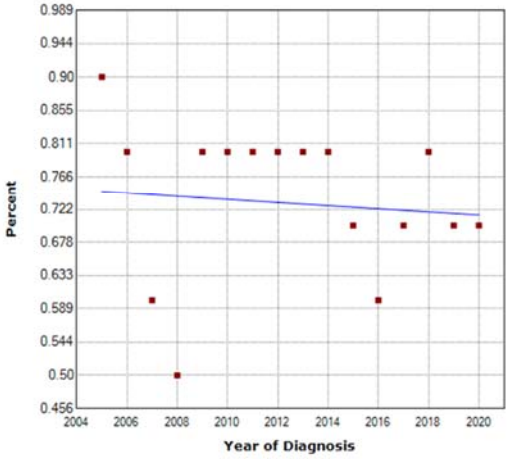
Conclusions: In this large-scale study, we found the PO-AKI had decreased recently, although the incidence of S-PO-AKI still had not changed.

Join-point regression analysis describing annual incidence trend of post-operative (A) acute kidney injury and (B) severe post-operative acute injury.

(A)


Percent
Year of Diagnosis
10
9
8
7
6
5
4
3
2
2004
2006
2008
2010
2012
2014
2016
2018
2020

(B)


Percent
Year of Diagnosis
0.989
0.944
0.90
0.855
0.811
0.766
0.722
0.678
0.633
0.589
0.544
0.50
0.456
2004
2006
2008
2010
2012
2014
2016
2018
2020