Incidence and outcome of acute kidney injury in hospitalized patients by an electronic alert

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Introduction

This study was to establish an electronic alert system and determine the incidence and mortality rate of acute kidney injury (AKI) among hospitalized adult patients in a tertiary metropolitan hospital of China.

Methods and Materials

A total of 99847 patients from Zhongshan Hospital, Fudan University, Shanghai, China between October 1st, 2018 and September 30th, 2019 were screened by the hospital medical database. The presence and severity of AKI were assessed by the KDIGO criteria. AKI patients (9.9%) were distinguished by electronic alerts.

Results

The average age of AKI patients was (61 ± 15.2) years, the median length of stay (LOS) 11 (6.5, 17) d, the hospital cost 3 8364（13769，85514）yuan.

The in-hospital mortality rate of AKI patients was 5.7% (563/9 898).

The community acquired AKI (CA-AKI) accounted for 37.9%, hospital acquired AKI (HA-AKI) 62.1%. Incidence of AKI stage 1, stage2 and stage 3 were 8% (7 955/9 9847), 0.7% (709/9 9847) and 1.2% (1 234/9 9847), in-hospital mortality were 4% (316/7 955), 11.4% (81/709) and 13.5% (166/1 234). The length of stay, hospital cost and mortality of AKI patients increased with AKI stages. Only 7.8% of AKI patients received nephrology consultation and 1.2% was recorded in discharge diagnosis. Multivariate logistic regression showed that age, AKI stage, HA-AKI, RRT, heart failure, malignancy, hypoalbuminemia and anemia were independent risk factors of in-hospital mortality of AKI patients.

Table 1. Comparison of clinical data of CA-AKI and HA-AKI patients

Patients	N	Male [n(%)]	Age (x̄±s, 岁)
CA-AKI	3 747	2 433(64.9)	60.0±15.1
HA-AKI	6 151	4 105(66.7)	61.6±15.2①

Patients	AKI stage [n(%)]		
	AKI stage 1	AKI stage 2	AKI stage 3
CA-AKI	3 200(85.4)	175(4.7)	372(9.9)
HA-AKI	4 755(77.3)①	534(8.7)①	862(14.0)①

Patients	Length of stay [M(P25, P75), d]	Medical cost [M(P25, P75), 元]
CA-AKI	6.5 (3.0, 11.5)	16 549(8 546, 41 932)
HA-AKI	13.5 (9.5, 21.0)①	55 399(24 241, 115 044)①

Patients	Renal consultation [n(%)]	RRT [n(%)]	Hospital mortality [n(%)]
CA-AKI	172(4.6)	129(3.4)	116(3.1)
HA-AKI	601(9.8)①	380(6.2)①	447(7.3)①

Conclusions

AKI is prevalent in the hospitalized patients with serious misdiagnosis and low nephrology consultation rate. Slight elevations of serum creatinine are associated with significantly increased mortality, LOS and hospital cost. The establishment of AKI electronic alerts and active intervention of nephrologists can significantly increase the recognition of AKI patients and may help prevent AKI and improve the prognosis of AKI patients.

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