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Acute kidney injury in acute carbon monoxide poisoning

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Objectives: Carbon monoxide (CO) poisoning is more likely to damage organs that require more oxygen such as the brain, heart, muscle, and kidney. Acute kidney injury (AKI) is considered an unusual complication of CO poisoning. Pathophysiology of AKI are ischemia, hypoxia, and nephrotoxicity. We evaluate the prevalence and related factors of AKI in CO poisoning.

Methods: We retrospectively analyzed from our prospectively collected CO poisoning registry data between January 2006 and September 2019 in a single academic medical center. AKI was defined according to guidelines of as Kidney Disease: Improving Global Outcomes (KDIGO). Patients were classified into the no-AKI and AKI groups. We performed multiple logistic regression for detecting predictors of the AKI occurrence. In addition, the analysis was conducted by matching the factors (age, sex, intentionality, CO exposure time, level of consciousness at the emergency department, diabetes mellitus, and hypertension) that may affect the AKI occurrence between the no-AKI and AKI groups for evaluating factors related of development of AKI.

Results: Included patients were finally 1,332 patients and out of 1,332 patients, 119 patients (8.9%) were developed AKI. There were stage 1 (63 patients, 52.9%), stage 2 (36 patients, 30.3%), and stage 3 (20 patients, 16.8%), respectively. After matching, there were statistically different in terms of peak troponin I, ß-natriuretic peptide, lactate, development of rhabdomyolysis, and muscle ischemia or abscess between the no-AKI and AKI groups. In multiple logistic regression, male sex (odds ratio: 1.922), serum lactate (odds ratio: 1.133), ß-natriuretic peptide (odds ratio: 1.001), development of rhabdomyolysis (odds ratio: 5.247), and muscle ischemia or abscess (odds ratio: 2.065) were significant predictors of the occurrence of AKI.

Conclusions: In CO poisoning, 8.2% of patients had AKI and stage 1 was most common. Male sex, serum lactate, ß-natriuretic peptide, development of rhabdomyolysis, and muscle ischemia or abscess were predictors of the occurrence of AKI.