



Urine Output Monitoring and Early AKI Detection



Urine output (UO) is a vital sign for critically ill patients but standards for monitoring and reporting vary widely between ICUs. New research indicates that intensive monitoring of UO was associated with increased detection of moderate to severe acute kidney injury (AKI), reduced incidence of fluid overload and is independently associated with reduced 30-day mortality in patients developing AKI.

"Our results should help inform clinical decisions and ICU policy around frequency of monitoring of UO especially for patients at high risk of AKI," write authors of the study, which will appear in the journal CHEST.

AKI affects approximately 60 percent of critically ill patients and results in substantial morbidity and mortality. Early detection of AKI is difficult resulting in delays in evaluation, discontinuation of nephrotoxins and treatment of other precipitating causes (e.g., sepsis). Experts have recommended the monitoring of urine output (UO) and serum creatinine (SC) for patients at risk for AKI.

Careful monitoring of UO could lead to earlier recognition of AKI and better fluid management. Researchers sought to determine if intensity of UO monitoring is associated with outcomes in patients with and without AKI. They performed a retrospective cohort study that included 15,724 adults who were admitted to ICUs from 2000-2008. Intensive UO monitoring was defined as hourly recordings and no gaps >3 hours for the first 48 hours after ICU admission.

Twenty-six percent (4,049) of the patients underwent intensive monitoring for UO and researchers found significantly higher rates of AKI in these patients. After adjustment for age and severity of illness, intensive UO monitoring was associated with improved survival, but only among patients developing AKI. With or without AKI, patients with intensive monitoring also had less cumulative fluid volume (2.98L vs. 3.78L, $p < 0.001$) and less fluid overload (2.49% vs. 5.68%, $p < 0.001$) over the first 72 hours of ICU stay.

"Two reasons may contribute to reduced measurement and recording of UO. First, measurement of UO is tedious and accurate hourly UO calculation is sometimes difficult to achieve; second, there has been a concerted effort in many (if not most) ICUs to discontinue Foley catheters as early as possible. We do not know what effect these efforts may be having on intensity of UO monitoring," the authors write.

The authors note that their study has important limitations, including the use of patients from only one medical centre, so that results may not be generalizable to all ICUs. Moreover, the results only apply to critically ill patients as defined by use of vasopressors or mechanical ventilation.

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