Appropriate Use of Urinary Catheter in Acute Heart Failure Patients

Tatsuo Aoki, MD, PhD

Urinary catheterization is commonly used to monitor urine output in patients with acute heart failure (AHF). Indeed, urinary catheterization facilitates accurate and continuous urine output monitoring, and can be essential for patients who are not ambulatory because of HF symptoms. However, the procedure has some complications, including urinary tract infection (UTI) and urethral injury. Previous study revealed that approximately 30% of in-hospital patients who underwent urinary catheterization had UTI caused by the procedure. Thus, urinary catheterization has not only benefits but also potential risks. A guideline on HF published from the European Society of Cardiology recommends urine output monitoring during AHF treatment, but not its routine use. However, the indications and risks of urinary catheterization in AHF patients remain to be elucidated.

In this issue of the Journal, Jang et al. examine the complication risks associated with urinary catheter in AHF patients. They retrospectively analyzed the medical records of AHF patients with NYHA III or IV symptoms who were admitted by emergency service to a general cardiology department; patients with acute coronary syndrome, impaired mentation, and/or critical illness were excluded. After propensity score matching, prognosis and occurrence of urinary tract complications were compared between 2 groups: patients with and without indwelling urethral catheterization (IUC). Several important findings were obtained in this study. First, 11% of the patients (35/316 patients) had in-hospital composite urinary complications, including UTI, hematuria and post-IUC-removal lower urinary tract symptoms, and the patients with IUC had a higher rate of in-hospital composite urinary complications (16% vs. 2%) and longer hospital stay (9 vs. 7 days), compared with those without IUC. Second, the occurrence rate of UTI in the patients with IUC was higher than in those without it even after discharge from hospital. Third, IUC was significantly associated with a higher occurrence of UTI, but not with short or long-term outcomes (30-day re-hospitalization for any cause and 1-year cardiac events). Fourth, IUC for longer duration was significantly associated with an increase in the in-hospital composite urinary complications (Figure).

Thus, this study demonstrates that IUC placement in AHF patients is associated with higher rates of urinary complications during and after hospitalization, and may...
prolong the hospitalization period. Importantly, IUC placement for longer periods may induce urinary complications more frequently.

Shimoni et al reviewed 122 patients who were admitted to an internal medicine department and had a newly inserted urinary catheter, demonstrating that IUC was definitely inappropriate in 14.8% of them, and was possibly inappropriate in 66 patients (54%). They also reported that instruction on more restrictive indications for IUC to physicians in emergency and internal medicine departments, and discussion on the appropriateness of all new urinary catheter insertions during daily chart rounds significantly reduced the rate of IUC without adverse outcomes. Surprisingly, Saint et al reported that 28% of physicians were unaware that a patient in their care had a urinary catheter. They also indicated the usefulness of prevention practices aimed at timely removal of urinary catheters for UTI, including catheter reminders and nurse-initiated discontinuation. In an institution where the practice is used, the occurrence of urinary catheter-associated UTI is significantly reduced compared institutions without the practice, suggesting that timely removal of urinary catheters is important to prevent urinary catheter-associated UTI. Thus, IUC facilitates urine output monitoring, which has theoretical benefits in the management of HF patients with acute volume overload and pulmonary edema, but it also increases the rate of urinary complications.

In this study, the authors were unable to identify which AHF patients could have benefited most from IUC despite the risk of urinary complications. The study subjects were patients with severe HF symptoms (NYHA III or IV), and almost half of the patients with IUC were excluded from the final analyses by propensity score matching. As mentioned in the study limitations section, the patients with higher propensity scores who were more likely to benefit from IUC were excluded from the analyses. Therefore, we need to pay attention to applying the results of this study to clinical practice. However, the present study suggests that cardiologists should be fully aware of the appropriate use of urinary catheter to reduce the urinary complications associated with urinary catheterization when treating AHF patients.

References