Impact of Nurse-Led Multidisciplinary Rounds on the Reducing of the Unnecessary Use of Urinary Catheters for Hospitalized Patients

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Abstract

Background: Duration of urinary catheterization (UC) constituted the main risk factor for healthcare associated urinary tract infections.

Aim: To evaluate the need for UCs and the reduction of its unnecessary use.

Method: A quality improvement intervention was conducted in a 75-bed community hospital in Duban (Qatar). Patients admitted from January to December 2015 were studied in selected inpatient wards (female, male and maternity wards). In a control group no modification of the current monitoring system was introduced, while in the intervention group regular multidisciplinary rounds with the participation of a catheter safety group were conducted to assess patients with Urinary catheters in place, and remove the unnecessary ones. UC utilization ratio (UR) was calculated on a monthly basis.

Result: Fifty UC were evaluated of which 30 were in the intervention group. The main indication was the peroperative use (64%) followed by urinary retention (28%), and the need for immobilization (8%). UC was interrupted in the 33% of the patients. The UR in the control group showed higher figures compared with the intervention group, which showed the highest UR in Jan 2015 (0.09), with a sustained trend to reduction to figures below 0.05. No catheter associated urinary tract infections were reported in the intervention and control groups.

Conclusion: The use of a multidisciplinary approach to evaluate the need for the urinary catheters by hospitalized patients led by nursing staff was associated with a reduction of their unnecessary use.

Keywords: Urinary Catheter; Utilization Ratio; Unnecessary Use; Quality Improvement

Introduction

Approximately 1-100 million indwelling urethral catheters are sold in the entire world every year and 8-24 millions of all these are annually sold in America. Despite the importance of catheters in the care of some patients, numerous studies have been published questioning their overall safety [1–3]. Approximately the 25% of all hospitalized patients have to be placed an indwelling urinary catheter at some time during their stay, and the daily risk of acquisition of bacteriuria varies from 3 to 7% when an indwelling catheter is in situ [1]. Urinary tract infection represents up to 34–40% of all hospital acquired infections, the great majority of which are urinary catheter-related [1,2].

Catheter-associated urinary tract infections (CAUTI) may increase the cost of care and the duration of catheterization is the predominant risk factor [1]. Doctors often forget that their patients have a urinary catheter, and these “forgotten” catheters are also often unnecessary. Other elements to be considered as needs for timely removing a urinary catheter (UC) are; patient discomfort and activity restriction due to the catheter [1].

In 202 hospitalized patients with a urinary catheter, the first indication for its insertion was noted as inappropriate in the 21% of all cases, and continued catheterization was noted as inappropriate for nearly half of the days actually needed by the patients using them [4]. Reasons for this misuse of UC or for faults on discontinuing them at the right time include being unfamiliar with the indications and the absence of a well-defined nursing management plan (grounded by published recommendations) for monitoring of their placement and needs [5,6]. Holroyd-Leduc in a general medical ward identified 14% of patients with UC without a specific medical condition and a greater risk of death and longer hospital stay [7]. The inappropriateess of catheterization and its adverse outcomes was reported in different setting and patient population, with special reference to the incidence of CAUTI, antibiotic use and length of hospital stay [8–10].

We identified failure in the timely removal of the urinary catheter in the medical-surgical wards; reason why we conducted a quality improvement intervention to evaluate the need for UCs and the reduction of its unnecessary use.

Method

This quality improvement intervention was conducted at The Cuban Hospital, a 75-bed community hospital in Dukhan, Qatar. The study population comprised patients admitted from January to December 2015 to female and male (surgical or clinical cases) and maternity wards.

The program involved the evaluation of an intervention and a control group. The control group included the patients admitted to female ward and maternity ward (23 beds), to whom no modification of the current monitoring system was introduced. This included the collection of information to calculate the urinary catheter utilization ratio (UR) (patient days, urinary catheter days) and the monitoring of bundles [11]. The intervention group included the patients admitted to male medical/surgical wards (27 beds), to whom in addition to the collection of information as in the control group, the following activities were carried out: Regular multidisciplinary rounds (minimum five times a week) with the participation of the catheter safety group (including nursing supervisor, infection control practitioner and the hospital epidemiologist) to assess patients with UC in place, and identify the indication, time in place, and criteria to maintain it. The data collection was done through criteria for urinary catheterization appropriateness verifying if one of the indications was present. If there was no appropriate indication for a patient’s UC use, the patient’s nurse would be asked to contact the physician to request discontinuation and document if the physicians ordered the removal. The appropriateness of UC use was evaluated, taking into accounts the criteria on CDC’s Guideline for Prevention of Catheter-Associated Urinary Tract Infection [12]. Patiens assessed and proven as having an appropriate indication for urinary catheterization, at the time of placement, were
reassessed to verify the necessity for the UC remaining in place or being removed, as previous criterion. Educational activities were conducted on an annual basis, including informal education during rounds, classroom and video conferences regarding prevention of CAUTI.

The principal indicator to follow the intervention was the UC utilization ratio (number of urinary catheter days divided by the number of days admitted). The urinary catheter ratio during the study period for the intervention and control groups were compared using the Z statistic for comparison of proportions (EPIDAT 3.0, Xunta de Galicia) with a significance threshold of \( p = 0.05 \).

Result

As a whole, 50 urinary catheters were evaluated of which 30 were in the intervention group. The main indication of urinary catheterization was the perioperative use (64%) followed by urinary retention (28%), and the need for immobilization (8%) (Figure 1).

Urinary catheterization was removed after advice during the rounds in 33% of patients. The control group had variability in the UR, which showed the maximum figure (0.11) during March, 15, with higher figures compared with the intervention group, which showed the highest figure in Jan 2015 (0.09), with a sustained trend to reduction to figures below 0.05 after the 4th month of intervention (Figure 2). The UC UR during the study period in the intervention group was 0.05 (standard deviation 0.017) and for the control group was 0.08 (standard deviation 0.210) \( (p = 0.00) \).

Discussion

Our findings have shown that an intervention aiming at a reduction of unnecessary urinary catheter was successful in a short term in medical-surgical patients. During the study period no catheter associated urinary tract infection was reported, probably related with various factors including the reduction of UC use and the compliance with other prevention practices. Nevertheless, the reduction of the duration of catheterization has been demonstrated as a critical factor related with the incidence of CAUTI \[1,10\].

Half century ago, Dr. Paul Beeson recognized the role of the indwelling urinary catheter in predisposing to urinary tract infection \[13\]. He observed that inserting an indwelling urinary catheter is “commonly regarded as a comparatively harmless procedure” and recommended that “the decision to use this instrument should be made with the knowledge that it involves risk of producing a serious disease ‘Over the ensuing 50 years, physicians’ attitudes regarding urinary catheterization appear to have changed little. Up to 25% of hospitalized patients will have an indwelling urinary catheter inserted, and over 50% of these may be unnecessary. Of grave concern is that bacteremia occurs in 1 to 4% of those patients who develop bacteriuria. In addition to causing this morbidity and occasional mortality, catheter-associated urinary tract infection substantially increases hospital costs.

The rate of inappropriate urinary catheter use and the overall use of urinary catheters were reduced in the intervention group of the study. An additional notable finding is that the investigators could find “no clear reason” for the indication for urinary catheter insertion in the medical record for two-thirds of the unnecessary urinary catheters.

In addition to causing infectious complications, indwelling urinary catheters also cause discomfort and embarrassment and restrict mobility. While catheter-associated urinary tract infection is a major problem, fortunately, it is largely preventable. Two simple changes in physician practice could eliminate most unnecessary urinary catheters: restricting their use to appropriate needs, as well as the promptly removal of it when the patient does not longer need it. Several studies have shown, in addition to the high rate of unneeded urethral catheter use in US hospitals, that an explicit reason or physician order for insertion of an indwelling urinary catheter is rarely documented in the medical record, further underscoring the inappropriate perception that this invasive intervention is benign \[14–16\]. Using various designs, several studies, including that by Fakih et al. \[14\] have shown that reminders to physicians can result in a reduced rate of inappropriate catheterization and a decreased duration of catheterization. At least other studies have shown that nurse-generated reminders to physicians can reduce the duration of catheterization and catheter-associated urinary tract infection \[16\]. They also educated their nursing staff about lower-risk alternatives to an indwelling urinary catheter and provided them with bladder scanners to allow noninvasive assessment for urinary retention. These combined interventions led to impressive and sustained reductions in the use of catheter and its indwelling duration, as well as the rate in catheter-associated infections of the urinary tract. Ultimately, we provide our patients with the safest possible hospital environment, reducing the incidence of unnecessary indwelling urinary catheters and the catheter-associated urinary tract infection that we promote will be a major step toward achieving this goal. The data strongly support the concept that, when in doubt – pull it out.

The study has few limitations to consider. First, the probable effect of a control group and it comparability could affect the reduction of UC use. Nevertheless, both groups (intervention and control) included medical and surgical patients with few differences in UC indications. Second, because of the duration of the intervention additional evaluation is required to demonstrate the sustainability of the interventions in all the facility.
In conclusion, the implementation of a nursing led multidisciplinary round contributed to the reduction of unnecessary UC use in medical-surgical patients. Additional educational efforts are required to sustain the achievement and the awareness of the prevention practices for urinary catheter associated infections.

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References


