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## Avoidable iatrogenic complications of male urethral catheterisation and inadequate intern training: A 4-year follow-up post implementation of an intern training programme

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### ARTICLE INFO

#### Article history:

Received 16 October 2013

Received in revised form

13 January 2014

Accepted 4 February 2014

Available online xxx

#### Keywords:

Urethral catheterisation

Catheter morbidity

Iatrogenic

Training programme

Questionnaire

Intern

### ABSTRACT

**Objective:** To assess the impact of a structured training programme in urethral catheterisation (UC) targeted at newly qualified junior doctors on rates of iatrogenic catheter morbidity within a tertiary care referral centre.

**Subjects and methods:** Male UC-related morbidities were retrospectively identified from our computerised inpatient urology consultation system over a 1-year period from July 2010 to June 2011. Relevant medical records were also reviewed. Results were compared with an initial study performed between July 2006 and June 2007, prior the introduction of a structured training programme in our institution. An anonymous questionnaire was used for the subjective assessment of interns about confidence in catheterising post introduction of the programme.

**Results:** Of 725 urological consultations, 29 (4%) were related to complications arising from male UC during the 1 year period. This reflected a statistically significant decrease when compared to our 2007 figures, 51/864 (6%) ( $p < 0.05$ ). Again, the most common indication for UC was monitoring urinary output for acute medical illness (19/29, 66%). The most common complication was urethral trauma (16/29, 55%). Of the 29 cases of UC-related morbidity, 18 (62%) resulted from interns performing UC, a decrease of 12% from our original paper. A drop of 27% was seen in the rates of UC related morbidity attributable to interns during the first 6 months of internship (July–December). Overall, 70% (vs 40% original study) of interns felt that their practical training was adequate since introduction of the programme ( $p < 0.01$ ) with 53% considering theoretical training adequate (vs 16% original study ( $p < 0.01$ )). When asked were they confident in performing UC, 63% said they were compared to 35% before introduction of the programme ( $p < 0.05$ ).

**Conclusions:** UC-related iatrogenic morbidity is not uncommon even in a tertiary-care teaching hospital. Implementation of a structured training programme in UC prior to the commencement of intern year has been shown to result in a significant decrease in the amount of iatrogenic UC related morbidity.

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<http://dx.doi.org/10.1016/j.surge.2014.02.001>

## Introduction

Urinary catheterisation (UC) is common practical procedure that newly qualified doctors are required to perform on a regular basis. Although seldom serious, iatrogenic urethral injury associated with catheter insertion can result in long-term sequelae including strictures, incontinence, erectile dysfunction, and infertility.<sup>1</sup> We had previously reported that UC related iatrogenic morbidity was a common occurrence, consisting of 6% of referrals to our urology department.<sup>2</sup> We had also reported that three quarters of catheter related morbidities occurred when the procedure was performed by interns and that rates of iatrogenic injury attributable to them steadily decreased over their first working year.<sup>2</sup>

Various other authors have questioned whether junior doctors training in UC prior to their regular and close involvement in the care of patients is sufficient.<sup>1,3–5</sup> Bigot et al. recently reported that of 277 final year medical students surveyed only 26% considered that they were able to confidently perform UC in males and 38.3% in females at the end of their medical training.<sup>3</sup>

Our results previously suggested that many of these catheter related injuries were potentially avoidable and that implementation of an appropriate training programme for newly qualified doctors may decrease occurrence. The aim of this follow up study from the same tertiary referral centre was to assess the impact of such a structured training programme targeted at newly qualified junior doctors prior to the commencement of their intern year.

## Methods

Male UC-related morbidities were retrospectively identified from our computerised inpatient urology consultation system over a 1-year period from July 2010 to June 2011. Relevant medical records were also reviewed to obtain information on patient demographics, co-morbidities, indication for and complications of UC, seniority of doctors involved in UC and further management of the complications. Results were compared with an initial study performed in 2007, prior to the introduction of a structured UC training programme in our institution (Appendix 1).

The inclusion and exclusion criteria were identical to that of the original paper, namely all urological inpatient consultations on complications from UC from non-urological departments; male adult patients having a first UC by a non-urological team member; the cohort of interns who graduated (Class of 2010) from the Royal College of Surgeons in Ireland (RCSI) working in various non-urological departments in our institution. Exclusions were: female patients, children (age <18 years), UC within the urology department, UC by urological team members; UC in the accident and emergency department, outpatient department and operating theatre; patients with indwelling urethral catheters that required a change of catheter. We used an anonymous follow up questionnaire for the subjective assessment of interns on the training programme and their satisfaction with same (Appendix 2).

The primary outcome measures were the prevalence of urethral trauma secondary to UC by a non-urological team member in non-urological departments, risk factors and intern perceived adequacy of the new training programme. Secondary outcome measures included the prevalence of gross haematuria secondary to UC, magnitude of other urological complications such as urinary tract infections (UTI)/urosepsis and paraphimosis, the distribution of these morbidities and level of seniority of doctors performing UC.

We also examined the type of catheter used, number of attempts at UC, time of UC (during normal office hours (08.00–17.00 h) or outside these hours while on-call, any urological intervention required, and the final outcome of any complications. Urethral trauma was defined as discharge of frank blood via the urethra, and/or gross haematuria during UC. UTI/urosepsis was defined as pyrexia after UC and/or a positive blood culture. There is no standard universal definition of 'adequate training', however it might be defined as how well a trainee performs a procedure when not being supervised, as suggested previously.<sup>2</sup> We arbitrarily defined the adequacy of UC where interns were comfortable independently with UC procedures based on their theoretical knowledge and practical experience. The level of training was categorised arbitrarily as none, minimal or adequate depending on the response of the intern; it was a subjective assessment.

Results were analysed statistically using Chi squared analysis with  $P < 0.05$  considered significant (SPSS for Windows (SPSS 16), SPSS Inc., Chicago, IL).

## Results

Of 725 urological consultations, 29 (4%) were related to complications arising from male UC during the 1 year period. This reflected a statistically significant decrease when compared to the 2007 figures, 51/864 (6%) ( $p < 0.05$ ). Again the most common indication for UC was monitoring urinary output for acute medical illness (19/29, 66%). The distribution of complications of UC are shown in Table 1; the most common complication was urethral trauma (16/29, 55%), 45% of patients developed visible haematuria immediately after UC

**Table 1 – Demographics of patients and the distribution of complications comparing 2007 and 2011 studies.**

Variable	2010–2011 n (%)	2006–2007 n (%)
UC related morbidities	29/725 (4)	51/864 (6)
Patient age, years (range)	71.6 (26–89)	70.2 (21–91)
Patient on anticoagulation	8 (28)	3 (5)
Indication for UC		
Monitor urinary output	19 (66)	34 (67)
Acute retention post surgery	10 (34)	17 (33)
Complications		
Urethral trauma	16 (55)	35 (68)
Gross haematuria	13 (45)	20 (39)
False passage	5 (17)	16 (31)
UTI/urosepsis	9 (31)	8 (15)
Paraphimosis	5 (17)	9 (17)

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