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PERSPECTIVE

The evidence supporting single-use intermittent catheters in people with spinal cord injury

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Abstract

Intermittent catheterization (IMC) is the accepted evidence-based best practice for bladder management in people with voiding dysfunction due to neurogenic bladder. The two methods for performing IMC over the decades since this practice was introduced are reuse and single-use catheters. There are perceived advantages and disadvantages of each method of performing IMC. There is considerable evidence that single-use IMC is associated with better health outcomes, including reduced risk of urinary tract infection, urethral trauma, and quality of life. People performing IMC also indicate a preference for single-use, although there are advantages of reuse that need to be acknowledged. Ideally, further research is needed in this area, particularly around the washing and storage of reuse catheters, as well as an adequately powered multicenter RCT comparing reuse with single-use IMC, but there are numerous challenges associated with progressing this research.

Introduction

Intermittent catheterization (IMC) is the accepted evidence-based best practice for bladder management in people with voiding dysfunction due to neurogenic bladder [1, 2], including those due to spinal cord injury (SCI) or non-traumatic spinal cord dysfunction (SCDys). IMC is minimally invasive [1], and relatively easy and painless [3]. When introduced by Guttmann in the 1960s IMC was taught as a sterile procedure [4]. In the 1970s it was modified into a clean technique [5], with catheter cleaning after catheterization and reuse of the catheter for multiple catheterizations.

When I first started working as a trainee in spinal cord rehabilitation medicine in Australia in the early 1990s it was routine practice for hospital inpatients to use sterile catheters, but when discharged, most patients performing IMC reused catheters. I recall being told of an Australian cowboy who had sustained an incomplete SCI and was able to ride his horse but needed to perform IMCs. He would keep his catheter wound around his hat. When he needed to perform an IMC, he would take his catheter off his hat, give it a wash with water from his drinking bottle, perform an IMC, give it another wash with water and a shake, wind it around his hat again, and ride off. Apparently, he only rarely got a UTI.

Later in my career, after I became a rehabilitation physician, during the 2000s I modified my clinical practice regarding patients with recurrent UTIs who had no cause identified. In these situations, I would discuss the option with patients regarding them switching from reuse to single-use catheters if they could afford to fund these personally or if they had compensation insurance from a work injury or motor vehicle accident that would fund the extra cost. At the 2013 ISCOS conference I had a discussion with a product representative from Wellspect about a number of issues related to this topic: the perceived advantages and disadvantages of IMC reuse vs. single-use, the lack of evidence on this topic and the challenge for my patients without insurance cover funding single-use catheters and that the public hospital system would not fund these for

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patients who could not afford to pay without evidence supporting the advantage to patients. The discussion of these issues subsequently continued and progressed to the stage where we formulated the basis of a before–after clinical trial of reuse compared to single-use IMC [6].

Our study assessed IMC with single or reuse catheters and focused on safety and the impact on quality of life [6]. The study involved 39 participants who practiced catheter reuse for a mean of 10 years, 6 times daily, and who agreed to prospectively evaluate single-use hydrophilic-coated catheters for 4 weeks. A reused catheter was collected from each participant and studied regarding microbial and debris contamination. There was a significant increase in the reported quality of life after switching from reuse to single-use hydrophilic catheters. At the conclusion of the study, 83% of participants preferred to continue using the single-use catheters. All collected reused catheters (100%) were contaminated by debris and 74% had contamination by microorganisms.

Our study on IMC reuse was initially conceptualized as only involving people with SCI or SCDys [6]. During the course of the project it was identified that the recruitment of participants was going to be far more challenging than anticipated and the inclusion criteria was expanded to IMC for any reason. Even with this change, recruitment was much slower than anticipated. I carried out an informal, non-systematic evaluation of potential reasons for this in the State of Victoria, Australia, where I was recruiting. I believe that the most influential reason for the recruitment problem was that for a number of years, community nurses had been recommending people performing IMC switch from reuse to single use. For some years clinical guidelines had not supported catheter reuse due to the lack of evidence on appropriate storage and cleaning procedures, for example the Centers for Disease Control and Prevention Guideline for Prevention of Catheter-associated Urinary Tract Infections, from 2010 [7]. Subsequent enquires led me to believe that this change in recommendation from community nursing had taken place around Australia. In recent years Australia has introduced a National Disability Insurance Scheme for people under 65 years that covers the cost of single-use catheters. Given the above changes, I believe that it would not be practical to attempt recruiting participants into a reuse IMC trial in Australia. The social and health systems in other developed countries also provide full or partial financial support for people who perform IMC using single-use catheters. Therefore, I believe that an adequately powered RCT of single-use versus recuse IMC would not be viable in many Developed countries.

Current international guidelines continue to highlight the lack of evidence on appropriate storage and cleaning procedures for reuse IMC [8]. Single-use hydrophilic catheters are recommended as the preferred method of bladder management [7, 9], with evidence supporting their reduced risk of urethral trauma [9–12], and urinary tract infection [12–15].

A recent qualitative study from the UK involving interviews with 39 IMC users explored the perceived advantages and disadvantages of single-use and reuse IMC [16]. This study highlighted that as well as the well described disadvantages of IMC reuse outlined above, additional disadvantages include the time spent cleaning and preparing the reuse catheters, having to carry used catheters, and transporting cleaning equipment when going on holidays. The study, however, also identified numerous advantages of reuse IMC. This includes not having problems with running out of catheters (such as during a pandemic), being cheaper, less bulk if traveling for extended periods, and lower impact on the environment. Not surprisingly, the authors suggested that further studies be carried out to reduce the safety concerns associated with reuse IMC. The environmental impact associated with single-use catheters has been highlighted by other authors [17].

My current perspective on the issue of IMC catheter reuse verses single use in people with voiding dysfunction due to neurogenic bladder, including those due to SCI or SCDys, is that in low resource countries, or where funding is not readily available in high resource countries, the practical reality, however suboptimal, is that reuse catheters are the only option available. However, in countries where the health or disability systems cover the cost of single-use catheters or people can afford the cost, given the evidence summarized here, single-use catheters should be the preferred routine method of choice.

Compliance with ethical standards

Conflict of interest The author was an investigator in the clinical trial sponsored by Wellspect HealthCare, Sweden, that was cited above (ref. 6).

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