Catheterisation – an overview

Catheterisation with a urinary catheter is necessary when there is urine left in the bladder that cannot be emptied through normal voiding – this is known as urinary retention. If not treated, urinary retention may cause infection, incontinence, nocturia and discomfort but also more severe complications such as renal failure and septicaemia. For people who rely on catheterisation, it really is a life-saving therapy.

Urinary retention can be caused by neurogenic bladder dysfunction or as the result of a lesion to the central and/or peripheral nervous system. Common diagnoses related to neurogenic bladder dysfunction are spinal cord injury, myelomeningocele (spina bifida), multiple sclerosis, Parkinson's disease, diabetes and stroke, and various rare congenital conditions such as bladder exstrophy. Also, cancer patients who have been treated for prostate, bladder, and bowel cancers may be left with damaged urethral and bladder tissue resulting in incontinence or urinary retention. Mechanical factors such as from benign prostatic hyperplasia can also cause urinary retention that necessitates catheterisation.

The most common complication of all types of catheterisations is urinary tract infection (UTI). The bladder is generally considered a sterile environment and the introduction of a catheter increases the risk of bacterial contamination. That said, the dangers associated with urinary retention, as mentioned above, are far greater than those associated with catheterisation[1]. It is important, therefore, to focus on innovations which improve the safety of catheterisation.

Types of catheterisation

Catheterisation can either be performed using an indwelling catheter or by practicing intermittent catheterisation.

Intermittent catheterisation is the regular emptying of the bladder using a catheter that is removed after each use. Intermittent catheterisation allows normal bladder dynamics and is very similar to normal voiding. An indwelling catheter remains in the bladder with a balloon or other retention mechanism and is either placed through the abdominal wall (suprapubic indwelling) or through the urethra (urethral indwelling). Suprapubic indwelling catheters are only recommended for short-term use. Urethral indwelling catheters carry the most risk for the patient and should be avoided as much as possible[2]. An indwelling catheter involves invasive placement and has a constant in and out flow, leaving a static bladder, meaning there is no movement in the bladder. Complications are more frequently seen with the use of indwelling catheters, including infections, bladder stones and catheter blockage.

Successful intermittent catheterisation has many advantages for the user; as well as helping to maintain good urinary tract health, it can result in improved self-confidence and self-esteem, improved quality of life with less incontinence/urgency, better sleep, ability to be physically and sexually active, and less pain and discomfort.[3]

Intermittent catheterisation is therefore the first choice therapy for both short- and long-term treatment.[4]

Long-term safety of intermittent catheterisation

Catheterisation is often a lifelong therapy, it is therefore essential that catheters are suitable for long-term treatment. It is important to both protect the urinary tract and avoid infections; for someone who relies on catheterisation five times a day, this can mean the difference between serious illness and hospitalisation or staying healthy and independent.

An example of innovation in intermittent catheters are single-use hydrophilic catheters, which were developed in the early eighties to address long-term complications of intermittent catheterisation, as seen when reusing plastic catheters with add-on lubrication. As reported by Wyndaele and Maes[5] and Perrouin-Verbe et al.[6], the majority of complications related to

intermittent catheterisation occur after long-term use as a result of damage to the urethral wall from repeated catheterisations. In contrast, long-term use of certain hydrophilic catheters is reported to prevent urethral trauma and complications.[7]

A number of recent reports support the use of single-use hydrophilic catheters to reduce the risk of urological complications such as UTI and hematuria (bleeding).[8] For example, Li et al. conclude that use of single-use hydrophilic catheters could reduce the risk of UTI by 64% and the risk of hematuria by 43% as compared to non-hydrophilic catheters.[9]

This supports recommendations for lubrication of the catheter to avoid trauma.[10]

The background to this recommendation is the complications seen after long-term use related to damage to the urethra from repeated catheterisations[11] and the fact that urethral trauma is associated with an increase in UTI risk.[12] Damage to the urethra is more likely to occur with an un-lubricated catheter,[44] and findings reported in the literature support the use of hydrophilic catheters to reduce the risk of hematuria/urethral trauma.[13] The reported incidence of trauma varies depending on the evaluation method (e.g. self-reported bleeding, microscopic observations) and the study set-up, but the literature suggests figures between 20-30% for patients practicing intermittent catheterisation.[14]

Reduction of the incidence of UTIs and other complications related to catheterisation can result in substantial cost savings for the health care system by reducing hospital admissions and helping people to maintain their independence.

User preference and compliance

Patient compliance is a key factor for ensuring good clinical outcomes, in that compliant patients have better clinical outcomes, as described by Vermeire et al. in their review in 2001.[15] For this reason, non-compliance is also related to a significant financial burden to the health care system and society with an estimated cost of about $100 billion each year in the US, affecting 30-50% of all patients, irrespective of diagnosis or setting.[16] Several factors affect compliance, and shared decision-making between doctor and patient has been recommended as a way to improve initial compliance to a treatment or a therapy.[17] Morris and Schultz further describe that patient long-term compliance is very dependent on whether the therapy fits into everyday life for the patient, and they conclude that emphasis should be on finding treatment options for the patients that work well with their life style and are easy to use.[18]

For intermittent catheterisation therapy, the benefits of compliance are reflected by several publications and guidelines which conclude that patients should be given a free choice of catheter to best meet their individual needs.[19] The greatest barrier to practicing intermittent catheterisation is reported to be access to bathrooms[20] and under such circumstances the use of a convenient and mess-free single-use catheter may improve compliance.[21] Ease of use and comfort related to hydrophilic catheters, for example, have been documented by a number of authors[22] and Chartier-Kastler and Denys conclude that many patients prefer hydrophilic catheters[23] when a choice is available. Moore et al. 2014[24] found that 71% of patients do not want to reuse non-coated plastic catheters and other authors have found about 70-80% patient preference for hydrophilic catheters.[25]

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