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Review

Patient-related risk factors for urinary retention following ambulatory general surgery: a systematic review and meta-analysis

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Abstract

BACKGROUND: Postoperative urinary retention (POUR) is a source of avoidable patient harm. The aim of this review is to identify and quantify the role of patient-related risk factors in the development of POUR following ambulatory general surgery.

METHODS: Studies published until December 2014 were identified by searching MEDLINE, EMBASE, and PsycINFO databases. Risk factors assessed in 3 or more studies were meta-analyzed.

RESULTS: Twenty-one studies were suitable for inclusion consisting of 7,802 patients. The incidence of POUR was 14%. Increased age and the presence of lower urinary tract symptoms significantly increased risk with odds ratios [ORs] of 2.11 (95% confidence interval [CI] 1.15 to 3.86) and 2.83 (1.57 to 5.08), respectively. Male sex was not associated with developing POUR (OR .96, 95% CI .62 to 1.50). Preoperative α-blocker use significantly decreased the incidence of POUR with an OR of .37 (95% CI .15 to .91).

CONCLUSIONS: Increased age and the presence of lower urinary tract symptoms increase the risk of POUR, while α-blocker use confers protection. Male sex was not associated with POUR. These findings assist in preoperative identification of patients at high risk of POUR.

Postoperative urinary retention (POUR) refers to the inability to initiate adequate micturition despite bladder distension in the early postoperative period.[1] It has been described as a complication of day-case general surgery for over 50 years but remains a common problem in modern day surgical practice, with reported incidences up to 49%.[2]

POUR is an obstacle in the provision of high-quality surgical care. It results in an increased morbidity for patients including the risks associated with bladder catheterization (urinary tract infection) and the psychological consequences of an unexpected surgical complication. POUR is responsible for 20% to 25% of unexpected inpatient admissions following day-case general surgery,[3,4] which has a direct cost implication to the institution but may also threaten the ability to accept elective operative admissions. Even when POUR is managed on an outpatient basis, the institution will need to provide a pathway to

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manage this, typically requiring urologist and specialist nurse clinics. The transition away from inpatient surgery with routine bladder catheterization and toward day-case procedures means the impact of POUR on surgical care is only going to increase. Furthermore, ever-increasing financial pressures have stimulated a drive toward increased efficiency in the provision of healthcare services. This is threatened by conditions such as POUR, where unexpected and potentially unnecessary costs may divert limited resources from providing high quality care.

Optimization of the day-case surgical pathway can be achieved with preoperative identification of patients at high risk of POUR and initiation of prophylactic interventions. To achieve risk prediction on a patient level, it is necessary to understand the role and interplay of the factors which increase the risk of, or provide protection against, POUR. Within ambulatory general surgery, several risk factors have been established relating to operative factors (including equipment and technique[5–12]) and anesthetic factors (including intravenous fluid use and route of anesthesia[13–23]). However, there is a paucity of work on the influence of "patient-related" factors. Patient-related factors are those unrelated to the surgery or anesthesia and are preoperatively identifiable, which are likely to include demographic data, comorbid status, and pharmacological history.

The aim of this systematic review with meta-analysis is to appraise the literature to identify and quantify the influence of patient-related risk factors on the development of POUR after day-case general surgery.

Methods

A systematic review with meta-analysis was carried out in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement.[24]

Literature search strategy

General surgical procedures that could be performed in an ambulatory setting were identified after discussion and consensus between the authors. A search strategy was then designed to identify studies published in peer-reviewed journals which report the risk factors for developing POUR after such procedures, using terms including "(urine OR urinary) AND retention," "(void* OR micturi*) AND (dysfunction OR difficult*)," "post-operative," "general surg*," and "anorectal." Using OvidSP, the following electronic databases were searched until the fourth week of December 2014 for English language articles: MEDLINE (1950 to present), EMBASE (1947 to present), and PsycINFO (1806 to present). In addition, the bibliographies of review articles returned in the search were examined to identify any additional studies of interest.

Criteria for study inclusion

Two authors (S.M. and A.S.) independently applied the inclusion criteria to the search results. This was achieved by initial title and abstract screening followed by retrieval of manuscripts for all studies that could not be excluded at the screening stage or where an abstract was not available. For inclusion, studies must use an experimental or observational design to compare the incidence of POUR across at least 2 cohorts defined by the presence or absence of a specified patient-related risk factor. Patient-related risk factors are defined as preoperatively identifiable and unrelated to the surgery or anesthesia, such as demographic data, comorbid status, and pharmacological history. All patients must have been age 16 or over at the time of surgery. Studies were excluded if they did not present primary data (review articles, commentaries) or were abstracts published in conference proceedings.

Surgical intervention. For inclusion in this review, the surgical intervention must be usually performed by a general surgeon and be possible to be performed on a day-case basis. The following procedures were deemed suitable: abdominal wall hernia repair (open or laparoscopic); anorectal procedures for anal fissures, fistulas, hemorrhoids, and abscesses; laparoscopic cholecystectomy; pilonidal sinus excision; mucosal resection for rectal prolapse; Nissen's fundoplication; and Heller's myotomy. In the case of 2 or more simultaneous surgical procedures, it was necessary that all fulfill the criteria of a suitable surgical intervention as stated here. Surgical procedures for the purpose of weight reduction or for malignant conditions were excluded. As routine intraoperative bladder catheterization was used variably between institutions, and given its nature as a potential confounder and intervention to decrease the incidence of POUR, studies were excluded if there was a statistically significant difference in the rate of intraoperative catheterization between the cohorts of interest.

Definition of postoperative urinary retention. POUR was defined as postoperative patient catheterization for difficulty in voiding or if the authors used the term "urinary retention." In order for the urinary retention to be considered "postoperative," it needed to be in the early postoperative period, typically less than 24 hours.

Data extraction

One author (S.M.) extracted the following data from each included study into a Microsoft Excel 2010 (Microsoft Corporation, Redmond, WA) database: author, year, study design, number of patients, surgical procedure undertaken, risk factor examined, and the incidence of POUR in each cohort. Study design was described as prospective or retrospective, with the former defined as identification of the potential risk factor preoperatively with future detection