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Original Research

Effect of Routine Catherisation on UTI Rates after Minor Gynaecologic Surgeries

Dr. Aishwarya Patidar[1], Dr. Deepika Verma[2], Dr. Bandana Patel[3]

[1,3]Junior Resident, Department of Obstetrics and Gynaecology, Index Medical College, Hospital and Research Centre, Indore, Madhya Pradesh, India
[2]Professor, Department of Obstetrics and Gynaecology, Index Medical College, Hospital and Research Centre, Indore, Madhya Pradesh, India

Corresponding author
Dr. AishwaryaPatidar
Email:aishwaryapatidar14@gmail.com

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ABSTRACT

Background: The incidence of urinary tract infections (UTIs) is notably higher in young sexually active females and those with a prior history of UTIs. The practice of routine urethral catheterization for bladder emptying before minor gynecological procedures raises questions about its potential association with an increased likelihood of bacteriuria or UTIs. This study aimed to evaluate the impact of routine urethral catheterization on urinary symptoms and infections in women undergoing minor gynecological surgeries

Materials and Methods: A total of 266 women scheduled for diagnostic hysteroscopy as part of their uterine evaluation prior to in vitro fertilization were included. Participants were randomly divided into two groups: Group I (those who underwent catheterization) and Group II (those who did not). Urine samples were collected and analyzed preoperatively and postoperatively, and participants were surveyed regarding urinary symptoms before and after the procedure.

Results: Postoperative urinary symptoms such as dysuria, frequency, and urgency were significantly more prevalent in the catheterized group compared to the non-catheterized group. Similarly, asymptomatic bacteriuria (ASB), UTIs, and the subsequent requirement for antimicrobial therapy were significantly more frequent in the catheterized group.

Conclusion: Routine urethral catheterization in women undergoing minor gynecological procedures was associated with a higher risk of dysuria, frequency, urgency, ASB, UTIs, and the need for antimicrobial treatment. This suggests that routine preoperative catheterization should be re-evaluated for such cases to minimize potential complications.

Key Words: Catheterization; Urinary Tract Infection; Female, Minor procedure

INTRODUCTION

Urinary tract infections (UTIs) are more prevalent among young, sexually active women and those with a history of UTIs. In hospital settings, UTIs are the leading reason for prescribing antimicrobial agents. Catheter-associated UTIs account for nearly 80% of all cases [1-3]. Urine cultures are generally performed when there is a high suspicion of UTI, which is based on clinical symptoms and the detection of leukocyte esterase and nitrites, indicating the presence of leukocytes and Gram-negative bacteria, respectively [4,5]. Performing urine cultures is recommended only in cases with UTI symptoms, altered urine appearance, odor, or turbidity, as well as during urological procedures or when a urinary catheter is inserted or replaced [5,6].

The presence of bacteria in urine can signify either a contaminated sample, a UTI, or asymptomatic bacteriuria (ASB). Specimen contamination, especially in females, should be suspected when significant numbers of squamous cells are observed in the urinalysis [7–9]. Diagnosing ASB and UTIs requires culturing urine samples obtained using methods designed to minimize contamination [10]. ASB is identified by the isolation of a single bacterial species in a quantitative count of 10^5 CFU/mL from the sample [11]. UTIs, on the other hand, are diagnosed when one bacterial species is found in

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quantities of $\geq 10^5$ CFU/mL in symptomatic women [12].

Preventive recommendations from the U.S. Centers for Disease Control and Prevention emphasize that, while avoiding catheterization may not always be feasible, it should be considered whenever possible. Routine catheterization is often performed before minor gynecological procedures to empty the bladder, as a full bladder can hinder the bimanual examination of the uterus or grasping of the uterine cervix. However, it remains uncertain whether such routine catheterization increases the risk of bacteriuria or UTIs [13].

As an alternative, women may be advised to void and empty their bladders before undergoing minor gynecological surgeries to avoid routine catheterization. This randomized study trial was designed to evaluate the impact of routine urethral catheterization on urinary symptoms and infections in women undergoing minor gynecological procedures.

MATERIAL AND METHODS

The study included 266 women scheduled for uterine cavity evaluation through diagnostic hysteroscopy prior to in vitro fertilization (IVF). Diagnostic hysteroscopies were scheduled postmenstrually during the early to mid-follicular phase of the menstrual cycle, typically 1–3 months before initiating IVF treatment. Women with known urinary tract anomalies, urinary stones, positive urinary symptoms (e.g., dysuria, frequency, urgency, or lower abdominal tenderness), or a history of UTIs within the six months preceding the study were excluded.

Eligible participants were randomized into two groups: Group I (catheterized group) consisted of women who underwent urinary catheterization to empty the bladder, while Group II (non-catheterized group) included those who voided urine spontaneously without undergoing catheterization prior to hysteroscopy.

The surgeon performed catheterization following sterilization and preparation. The vulva was separated, and the external urethral opening was cleansed using a cotton swab soaked in plain water. A Foley's catheter (size 12–14 Fg) was then inserted into the bladder under aseptic conditions for a single evacuation, after which it was removed.

Routine preoperative urine samples were collected and compared with postoperative urine cultures in participants who developed urinary symptoms. Participants were also queried about urinary symptoms (e.g., dysuria, urgency, frequency, or lower abdominal tenderness) before and after the procedure. Urine cultures were performed for all participants preoperatively and postoperatively. Antimicrobial therapy was prescribed for women with positive urinary symptoms and confirmed infections, while women diagnosed with asymptomatic bacteriuria (ASB) did not receive antibiotics.

Data were organized, tabulated, and analyzed using the SPSS software. Numerical data were expressed as means and standard deviations, while categorical data were presented as frequencies and percentages. Statistical tests included the Student's t-test for parametric numerical data and the Chi-square (χ^2) test for categorical data. A p-value of <0.05 was considered statistically significant.

RESULTS

The mean age of the catheterized group was 27.47 ± 5.4 years, while the non-catheterized group had a mean age of 28.17 ± 6.2 years, with no significant difference (P = 0.32). The mean BMI was 22.01 ± 4.4 kg/m² for the catheterized group and 21.98 ± 5.3 kg/m² for the non-catheterized group, showing no significant difference (P = 0.96). Similarly, the duration of the procedure did not differ significantly between the two groups (P = 0.28) (Table 1).

Table 1: Demographics of study groups

Variables	Catheterized (n=133)	Non-catheterized (n=133)	P value
Age (years)	27.47 ± 5.4	28.17 ± 6.2	0.32
BMI (kg/m²)	22.01 ± 4.4	21.98 ± 5.3	0.96
Duration of procedure (minutes)	7.5 ± 2.8	7.8 ± 1.6	0.28

Post-operative comparisons revealed significant differences in several outcomes between the two groups. The catheterized group had a notably higher frequency of micturition (29 patients) compared to the non-catheterized group (8 patients), with a statistically significant difference (P < 0.05) (Table 2). Similarly, dysuria was more prevalent in the catheterized group, affecting 24 patients, compared to 6 patients in the non-catheterized group (P < 0.05). The catheterized group also experienced a higher incidence of urgency, with 20 patients reporting this symptom compared to 4 in the non-catheterized group, and the difference was significant (P < 0.05). Additionally, urinary tract infections (UTI) were more common in the catheterized group, with 20 patients diagnosed compared to only 2 in the non-

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catheterized group, a significant finding ($P < 0.05$). Asymptomatic bacteriuria was observed more frequently in the catheterized group, with 17 patients compared to 3 in the non-catheterized group ($P < 0.05$). Furthermore, the need for antimicrobial treatment was significantly higher in the catheterized group, with 20 patients requiring treatment compared to 2 in the non-catheterized group ($P < 0.05$).

Table 2: Post-operative comparison of study groups

Variables	Catheterized (n=133)	Non-catheterized (n=133)	P value
Frequency of micturition	29	8	<0.05
Dysuria	24	6	<0.05
Lower abdominal pain	24	13	0.08
Urgency	20	4	<0.05
UTI	20	2	<0.05
Asymptomatic bacteriuria	17	3	<0.05
Antimicrobial treatment needed	20	2	<0.05

DISCUSSION

The practice of routine catheterization for bladder emptying before minor gynecological procedures remains controversial, as its association with a higher incidence of bacteriuria or UTIs is unclear. This randomized controlled trial was designed to evaluate the impact of routine urethral catheterization on urinary symptoms and infections in women undergoing minor gynecological surgeries. Findings revealed that post-operative symptoms such as dysuria, frequency, and urgency were significantly more prevalent in the catheterized group.

Emily et al. conducted a study involving 200 women undergoing minor gynecological procedures, randomized into catheterized and non-catheterized groups. Participants, blinded to their group allocation, provided preoperative and postoperative urine samples for culture [13]. Emily et al. reported a relative risk of postoperative bacteriuria of approximately 1.24 for catheterized patients. Although this study did not identify relative risks for dysuria, frequency, and urgency, the authors noted that postoperative urinary discomfort was infrequent and comparable between catheterized and non-catheterized groups. They did not investigate or compare the relative risk of urinary discomfort between the two groups [13].

Emily et al. concluded that single-use catheterization before minor gynecological procedures did not significantly elevate postoperative bacteriuria or urinary discomfort [13]. However, our findings indicate that even a single catheterization increases the risk of dysuria, urgency, frequency, ASB, UTIs, and the need for subsequent antimicrobial treatment.

Approximately 80% of UTIs are linked to catheter use. Additionally, Trautner et al. identified catheter-associated urinary tract infections (CAUTIs) as a leading type of hospital-acquired infection, noting that many cases treated as CAUTIs are actually instances of asymptomatic bacteriuria (ABU) [10].

Trivedi reported that dilation and curettage and uterine evacuation are among the most common minor gynecological procedures, for which routine urinary catheterization is generally unnecessary [14]. Surgeons are encouraged to reconsider routine preoperative catheterization for women undergoing minor gynecological surgeries, as most women can adequately void their bladders independently. This approach could reduce the incidence of UTIs and minimize the need for antimicrobial therapy [15].

CONCLUSION

Routine urethral catheterization in women undergoing minor gynecological procedures was associated with a higher risk of dysuria, frequency, urgency, ASB, UTIs, and the need for antimicrobial treatment. This suggests that routine preoperative catheterization should be re-evaluated for such cases to minimize potential complications. The primary limitation encountered was participants' reluctance to openly discuss their urinary symptoms, which may have affected symptom reporting. Further large-scale studies are necessary to validate the adverse effects of routine preoperative catheterization in women undergoing minor gynecological surgeries.

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