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Postoperative Urinary Retention in Orthopedic Patients at the Department of on - Demand Services of Vietduc University Hospital

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Background

Objective: The postoperative urinary retention (POUR) is one of the most common complications after surgery of lowe limbs. Aim of this paper is to assess POUR rate and risk factors for orthopedic surgical patients.

Materials and methods: This cross-sectional study has been conducted at the department of on-demand services of Viet Duc hospital from January 2019 to April 2019.

Results: Among 197 patients underwent the orthopedic surgery, mean age was 48,34 years old (range: 18-94). Male accounted for 62,4%. POUR rate accounted for 19,3%; Risk factors related were aging patients, lumbar surgery, type of anaesthesia.

Conclusions and recommendations: POUR rate for orthopedic surgery in this series was accounted for 19,3%, we suggested that healthworkers need to explain about this issue to patients, especially the patient who will undergo the lower limb surgery with spinal and epidural anesthesia, epidural analgesia.

Keywords: Postoperative urinary retention; Orthopedic surgery; Anesthesia complications

1. Introduction

Post-operative Urinary Retention - POUR is dysfunction of urinary excrete after surgery, characterized by impaired bladder emptying, with an elevation in the volume of retained urine. POUR is a common complication of post – surgery and anesthesia [1,2,3]. POUR does not carry a high risk of mortality. However, it can result the problems to patients as abdominal uncomfortable, can not urine normally. Prolonged urine retention leads to nosocomial infection such as urinary tract infection, long hospitalization. Some international colleagues have reported in their studies as Elizabeth J Geller [4] (2014) showed that POUR is a common problem not only in obstetric surgery, also in abdominal and perineal surgeries, Alaa Abdel [5] (2015) found that POUR is a common complication after spinal than general anesthesia in orthopedic patients; according to Lars S Bjerregaard [6] (2014), POUR is a well-known complication in hip surgery and knee arthroplasty up to 75%.

In Viet Nam several authors have also reported this issue. In the report of Ta Đang Quang, and Nguyen Thi Thao [7], POUR is a common complication of hemorrhoidectomy, the application of pad - electro acupuncture combined with prostigmin could resolve this problem.

VietDuc University Hospital is a leading center of surgery in Vietnam, performs annually about 70,000 operations and POUR issue is concerned and mentioned. Some statistic of recently showed that POUR after orthopedic – trauma surgery was increased, can cause the high rate of urinary infection, high cost of treatment and prolonged hospitalization. Therefore we conducted the study aiming

1. To evaluate POUR for patients with trauma - orthopedic surgery in the Department of on-demand services of Viet Duc University Hospital in 2019.
2. To identify the related factors and make the recommendations.

Material And Methods

Subjectives:
Inclusion criteria:

All trauma - orthopedic patients were operated from 1/1/2019 to 30/4 /2019 enrolled in this study.
Age >= 18 years old, does not matter genders

Exclusion criteria:

Spinal disease, head injury,
Urinary tract disease,

Patients and family do not agree to involve to the study,

Methods:

Time: from 1 January 2019 to 30 April 2019
Site: Department of on – demand services – Viet Duc University Hospital
Design: Cross – sectional descriptive and comparative study.
Collecting information*:*
Once the paients were sent back to ward after surgery, they will be monitoring urine status until to be discharged.
The following information of urine status will be recorded:

- One time per hour during first 6 hour after surgery
- Every 3 hour in next 24 hours
- Two times per day after this date and recorded into the study form.
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Indicators:

- Subjectives characteristics: age, gender, diagnosis, surgical procedures, types of anesthesia,
- Urinary status as well as urinary retention, handle time of management, number of bladder catheter.
- Relative factors: age group, gender, surgical procedures, type of anesthesia, post-operative pain control …

Data collection:

It was recored to the designed forms

Data analysis:

The data was processed and analysed with the software SPSS 16.0.

Results

From the 197 patients underwent orthopedic surgery were evaluated.

Age group	**n**	**%**
< 40	69	35,0
40-59	72	36,5
> =60	56	28,4
Total	197	100

Mean = 48.34	Max = 94	Min = 18
Sex	**n**	**%**
Male	123	62,4
Female	74	37,6
Total	197	100

Remarks: Average age was 48,34 years old, with an oldest was 94 years and a youngest was 18 years old. Of them, 62.4% were male and 37.6 % were female.
Table 1: Characteristics of study subjects

Types of surgery	**n**	**%**
Joint surgery Hip replacement Knee replacement	 57 7	 28,9 3,6
Surgery on lower extremities	94	47,7
Surgery on upper extremities	39	19,8
Total	199	100

Remarks: Regarding the type of surgical procedures: lower extremities surgery accounted for 80.2% and upper extremmities surgery in 19.8%.
Table 2: Types of surgical procedures

Types of anesthesia	**n**	**%**
General anesthesia	16	8,1
Spinal anesthesia	150	76,1
Combination of general and spinal anesthesia	2	1,0
Brachial Plexus blockage	29	14,8
Total	197	100

Remarks: Type of anesthesia: most common were spinal aneathesia accounted for 76.1%, regional blockage in 14.8% and 8.1% of general anesthesia. 1.0 % of the patients received combined anesthesia (general + spinal anesthesia
Table 3: Types of anesthesia

Types of analgesia	**n**	**%**
IV analgesia	114	57,9
Epidural analgesia	53	26,9
Nerve analgesia	12	6,1
PCA (Pain-controlled analgesia)	16	8,1
Brachial plexus anesthesia	2	1,0
Total	197	100

Remarks: Postoperative analgesia used: 57.9% received IV analgesia; 26.9 % received continuous epidural analgesia; only 6.1% patients received nerve analgesia and 8.1% patients received PCA.
Table 4: Post – operative pain control

Postoperative urinary retention	n	%
POUR	38	19,3
Normal urine	159	80,7
Total	197	100

Remarks: The urinary retention rate was in 19.3%.
Table 5: Postoperative Urinary Retention - POUR

Number of urinary catheterization	n	%
1 time	34	89,5
2 times	3	7,9
3 times	1	2,6
Total	38	100

Remarks: of 38 patients have complicated POUR, 89.5% had catheterization for one time, 7.9% two times and 2.6% three times.
Table 6: Number of urinary catheterization

Relative factors Age groups	POUR (%)	n (%)	p
< 50	16 (14,3%)	96 (85,7%)	< 0,05
> = 50	22 (25,9%)	63 (74,1%)	
Total	38	159	

Remarks: Rate of POUR is related higher in elderly patients, with statistical significance, p < 0,05.
Table 7: Ages group related to POUR

Relative factors Sex	POUR (%)	n (%)	p
Male	24 (19,5%)	99 (80,5%)	> 0,05
Female	14 (18,9%)	60 (81,1%)	
Total	38	159	

Remarks: From those patients complicated POUR, we verified that 24 patients were men and 14 patients were women, with no statistical significance, p > 0.05 .
Table 8: Sex factors related to POUR

Relative factors Types of surgery	POUR (%)	n (%)	p
Hip replacement	23 (40,3%)	34 (59,7%)	< 0,001
Knee replacement	1 (14,3%)	6 (85,7%)	
Surgery on lower extremities	14 (14,9%)	80 (85,1%)	
Surgery on upper extremities	0	39	
Total	38	159	

Remaks: Almost POUR were related to the surgery on lower extremities (P < 0,001).
Table 9: Types of surgery related to POUR

Relative Factors Types of anesthesia	POUR (%)	no (%)	P
General anesthesia	1(6,2%)	15 (93,8%)	< 0,05
Spinal anesthesia	37 (24,6%)	113 (75,4%)	
Combine anesthesia and spinal anesthesia	0	2	
Brachial plexus anesthesia	0	29	
Total	38	159	

Remarks: Almost of patient complicated POUR underwent the spinal anesthesia (P < 0,05).
Table 10: Types of anesthesia associated with POUR

Relative factors Types of analgesia	Pour (%)	no (%)	P
IV medications	3 (2,6%)	111(93,4%)	< 0,001
Epidural	28 (52,8%)	25 (47,2%)	
PCA	5 (31,2%)	11(68,8%)	
Nerve	2 (16,6%)	10 (83,4%)	
Brachial Plexus	0	2	
Total	38	159	

Remarks: Almost patients complicated POUR received the epidural analgesia (P < 0,001).
Table 11: POUR and post-operative pain control

Discusions
Post operative urinary retention rate:

POUR is a common problems for patients after surgery, especially in elderly people and have a long pain control. Several colleagues have reported it [1,6,9]. In our series the average age of subjects accounted for 48.34, the oldest was 94 years old and the youngest was 18 years old, men accounted for 62.4%, women in 37.6% similar to other reports. There are 42.1% of patients were indicated for post-operative pain relief, of which 26.9% for epidural pain relief, 6.1% by nerver alangesia, 8.1% by PCA and 1.0% by brachial plexus anesthesia and the duration for post-operative pain relief was for three days. Postoperative pain control is only used to relieve common intravenous pain such as perfalgan, rifaxon, paracetamol ...
The urine position was concerned because in the postoperative

days the patients often urinate in bed due the anesthesia they cannot sit up or go to the toilet. Also the pressure on the neck of the bladder is decreased due to the amount of urine flowing towards the bottom of the bladder. The best posture is that the patient can access the toilet, men urinate standing up and women walk in a sitting position [5,10].

Out of 197 cases of orthopedic trauma surgery, 38 patients (19.3%) had complicated urinary retention after surgery and have received the urinary catheterization. This result is equivalent to the result of Maria do Carmo B. Carvalho Fernandes et al. (2007), the rate of POUR was 22% [9]. In 38 cases with POUR, 47.4% were applied warm compresses to the bladder area. Research by Zuleyha Yaban Simsek (2017) on the efficacy of nursing intervention should prevent management of urinary retention patients after orthopedic trauma. The results showed that the warm compressing group reduced the incidence of urinary catheterization after surgery by 3.9% and that in the group without warm compressions by 31.2% [11]. Study conducted by Ki Hyuk Sung and Kyoung Min Lee at al (2014) for POUR of orthopedic trauma patients and to identify the risk factors showed that: the rate of POUR was 2.3% [1], lower than our study results. 42, 1% of patients received the abdomen massage when they feel to be not able to urinate. There has been a number of studies suggesting that a warm compress helps the muscles of the bladder neck relax and that patients can urinate on their own after the application. The patient is massaged and gently tapped the bladder area, which relaxes the neck muscles of the bladder and acts on the nerves in the episiotomy and helps the patient to urinate [7,11,12]. In our series, 89.5% of patients have received the bladder catheter one time, then they can urinate their own after removing the catheter. 7.9% of patients have to insertion of the catheter for the second time. In one case, 3 times of catheterization must be placed after surgery.

Factors associated with urinary retention

The age group is related to POUR and statistically significant with $p < 0.05$ in our study. The older patient, should have more disturbed the bladder muscles in regulating urination. Elderly male patients often suffer from urination and prostate diseases, thus affecting the POUR. It's similar to other reports [1,2,3,8]

All patients with POUR are lower limb surgery, most patients with lower limb surgery are insensitive with live or epidural anesthesia. Patients with upper limb surgery are often insensitive with general anesthesia or numbness of the brachial plexus, so it has little effect on the nerve area that controls urination. Research by Alaa Abdel azizNiaziMohamed Abdel azizTaha (2015) on POUR after general anesthesia and local anesthesia in orthopedic trauma patients showed that the rate of POUR in patients with local anesthesia was higher than in general anesthesia [5]. Therefore, doctors and nurses should also explain the risks and POUR that may occur after surgery.

Postoperative pain relief has an effect on POUR and has statistical significance with $p < 0.05$ in our series. Our study found factors related to POUR such as age group, surgical method, anesthetic types, postoperative pain relief. Compared with several studies by other authors such as Maria Carmo Barretto de Carvalho Fernandes et al. (2007), there was also a statistically significant association between patients receiving persistent epidural pain relief and fentanyl and high POUR rate [9]. The 2007 study by Lingaraj et al in Singapore on identifying risk factors for POUR in 125 patients after total knee replacement surgery. The results showed that the risk factors were male sex and epidural anesthesia associated with POUR [8]. Research conducted by Ki Hyuk Sung et al. 2014 in Korea revealed that the risk factors were: old age, male sex, joint replacement surgery, history of high blood pressure, diabetes related to POUR [1].

Conclusions And Recommendations

The study showed that POUR for orthopedic surgery accounted for 19,3% in our series, resulting the prolonged hospitalization, unconfortable feeling and cost. Therefore we recommended that

- Health staff need to explain about POUR to patients to better understand and to prevent, especially, the patient are undergoing lower limb surgery, spinal anesthesia, epidural analgesia.
- Pay more attention to the patients at high risk of POUR for early detection and management.
- Improve the health education for this issue before and after surgery

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