

A study of incidence of post-operative urinary retention following spinal anaesthesia

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Abstract

Background: Urinary retention is one of the most common problems contributing to surgical procedures. Proper management of patients pre operatively and intraoperatively can reduce the incidence of POUR. **Aim and objective:** To study the incidence of post operative urinary retention following spinal anaesthesia. **Methodology:** Present study was an observational study conducted on 100 patients of ASA1 and ASA2 aged 20-60 years of either sex posted for lower limb /lower abdominal surgery under spinal anaesthesia. All patients were closely followed for 24 hours post operatively for voiding and were graded into various voiding difficulty grades. Data was analysed with appropriate statistical tests. **Results and discussion:** Mean age of the patients was 49.3± 3.1 years. Male to female ratio was 4:1. Incidence of post operative urinary retention was 40%. Increasing age was significantly associated with higher incidence of POUR. (p<0.05). Males show higher incidence of difficulty in voiding urine than females but the difference was not statistically significant (p>0.05).

Key Word: urinary retention following, spinal anaesthesia.

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INTRODUCTION

Subarachnoid (spinal) block is a safe and effective alternative to general anaesthesia when the surgical site is located on the lower extremities, perineum (e.g., surgery on the genitalia or anus) and lower abdominal wall (e.g., inguinal herniorrhaphy). Because of the technical challenges of readily identifying the epidural space and the toxicity associated with the large doses of local anaesthetics needed for epidural anaesthesia, spinal

anaesthesia was the dominant form of neuraxial anaesthesia well into the 20th century.¹ There are certain post-operative problems related to spinal anaesthesia which can increase patient's morbidity and distress. One of the most common post-operative complaints is post-operative urinary retention (POUR) has been defined as the inability to void despite a full bladder. This is related to many factors and multiple variants can have variable influence on incidence and severity of urinary problems and even post-operative urinary retention (POUR). Spinal anaesthesia influences the urination by blocking all afferent nerve fibres, rendering the patient unable to feel bladder distension of urinary urgency. In spinal anaesthesia, detrusor muscle strength and the ability to void restarts with return of sacral sensation to pinprick. Even a single episode of bladder over distension can result in significant morbidity. Overfilling of bladder can stretch and damage the detrusor muscle, leading to atony of the bladder wall, so recovery of micturition may not occur when the bladder is emptied. On other hand, the excessive use of an indwelling catheter can lead to UTI, urethral

stricture and prolonged hospital stay. Short-term prophylactic catheterization is recommended in patients with obstructive symptoms. Type of surgery (higher incidence in lower abdominal surgeries), anaesthesia (general vs. regional), age of patient (higher incidence with increasing age) and sex (males>females) have influence on incidence and severity of POUR.^{2,3} In a Medline-based search study by Jenson *et al.* (2002)⁴ the incidence of POUR following inguinal herniorrhaphies performed under local anaesthesia, regional anaesthesia and general anaesthesia were 0.37%, 2.4% and 3.0%, respectively. The investigators concluded that the type of anaesthesia significantly influenced the risk of POUR and spinal anaesthesia significantly influenced the risk of POUR. Urinary retention is one of the most common problems contributing to surgical procedures. Recent studies have shown the benefits of α -adrenergic blockers in preventing post-operative urinary retention (POUR). Present study was conducted to find out the incidence of post operative urinary retention following spinal anaesthesia in lower limb or lower abdomen surgeries.

Aim and objective: To study the incidence of post operative urinary retention following spinal anaesthesia.

MATERIAL AND METHODS

Present study was an observational study conducted at Indira Gandhi Medical College and associated hospitals Shimla. Study population was 100 patients of ASA1 and ASA2 aged 20-60 years of either sex posted for lower limb /lower abdominal surgery under spinal anaesthesia.

Inclusion Criteria: 1. Patients posted for lower limb / lower abdominal surgery under spinal anaesthesia 2. Patients willing to participate in the study.

Exclusion criteria: 1. Patients with urinary tract disease 2. Catheterised patients. 3. Patients with warfarin 4. Patients with sitting systolic blood pressure in the upper extremity of less than 100 mmHg at the time of eligibility screening 5. Patients with Intra operative IV fluid more than 1500 ml 6. Patients with intraoperative blood loss more than 750 ml.

Study was approved by ethical committee of the institute. A valid written consent was taken after explaining study to them.

Patients under the study were thoroughly assessed preoperatively regarding detailed history, physical examination and all necessary investigations. Patient were catheterised. Vital parameters like pulse, blood pressure both systolic and diastolic, respiratory rate, oxygen saturation were measured. After keeping complete resuscitation and anaesthesia instruments ready, spinal anaesthesia was given. Painting and dressing was done with aseptic precautions. Depending on the requirement of spinal blockade level inj Bupivacaine (heavay) was administered

at level L3-L4 with spinal needle. Intraoperatively patients were monitored for vital parameters like pulse, BP, respiratory rate and oxygen saturation etc.

All patients were closely followed for 24 hours post operatively for voiding and were graded into various voiding difficulty grades as given:

Grade 0: Spontaneous voiding without difficulty.

Grade 1: Voiding with difficulty.

Grade 2: Intermittent single evacuation of bladder.

Grade 3: Intermittent repeated evacuation of bladder

Grade 4: Continuous catheterization.

Data was collected with pre tested questionnaire. Data included demographic data, clinical history and clinical examination. Intraoperative hemodynamic of the patient, level of blockade and details of post operative urinary retention were noted.

Data was entered in the excel sheet. Data was analysed with appropriate statistical tests.

RESULTS

In our study we studied 100 patients undergoing spinal anaesthesia. Mean age of the patients was 49.3 ± 3.1 years. Majority of the patients were from the age group of 50-60 years (32%) followed by 30-39 years (30%). Patients in the age group of 20-29 years and 40-49 years were 21% and 17% respectively. In our study, 80% of the patients were male and 20 % patients were female. Male to female ratio was 4:1. Out of total 100 patients 59 patients underwent lower limb surgeries and 41 patients underwent lower abdomen surgeries. Table 2 shows voiding difficulty in patients after spinal anaesthesia. Majority of the patients had spontaneous Voiding without difficulty G0 (60%). Voiding with difficulty (G1) was observed in 17% patients. Intermittent single evacuation of bladder (G2) was seen in 7% patients. Intermittent repeated evacuation of bladder (G3) was observed in 8% patients. Continuous catheterization was seen in 8% patients. Thus in our study incidence of post operative urinary retention was 40%. Table 3 shows Voiding difficulty in patients according to age group. In age group of 20-29 years, out of total 21 patients had no voiding difficulty. None of the patient had voiding difficulty. In age group of 30-39 years 25 (83.33%) patients had no urinary retention and 16.67% patients had Grade 1 difficulty in voiding urine. In age group of 40-49 years, out of total 17 patients majority 12(70.59%) had no urinary retention 4 patients (23.53%) had grade 1 difficulty in voiding urine and 1 patient (5.88%) had grade 2 difficulty in voiding urine. In the age group of 50-60 years, only 2 patients were not having difficulty in urine voiding remaining 30 patients had difficulty in passing urine. Grade 1 difficulty was seen in 8(25%) patients and grade 2 difficulty was seen in 6(18.75%). Grade 3 and grade 4 difficulty was observed in 25% patients each. Thus we can

conclude that as the age increases there is increase in voiding difficulty of the patients post operatively. Significant increase in the voiding difficulty in patients with increase in age was observed ($p < 0.05$). Table 4 shows Voiding difficulty in patients according to sex. Out of total 100 patients 80 were male and 20 were female. Among male majority 47(58.75%) were not having any difficulty in voiding urine. 14 patients had grade 1 voiding difficulty and 4 patients had grade 2 voiding difficulty. In females 65% females did not have any difficulty in voiding urine after spinal anaesthesia. Males show higher difficulty in voiding urine than females but the difference was not statistically significant ($p > 0.05$).

Table 1: Distribution of patients undergoing spinal anaesthesia according to age group

Sr no	Age group	No of patients	Percentage
1	20-29	21	21%
2	30-39	30	30%
3	40-49	17	17%
4	50-60	32	32%
5	Total	100	100%

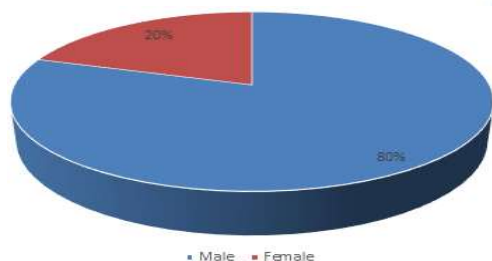


Figure 1: Distribution of patients undergoing spinal anaesthesia according to sex

Table 2: Voiding difficulty in patients after spinal anaesthesia

Sr no	Voiding grade	No of patients	Percentage
1	G0	60	60%
2	G1	17	17%
3	G2	07	7%
4	G3	08	8%
5	G4	08	8%
6	Total	100	100%

Table 3: Voiding difficulty in patients according to age group

Sr no	Age	G0	G1	G2	G3	G4	Total
1	20-29	21	00	00	00	00	21
2	30-39	25	05	00	00	00	30
3	40-49	12	04	01	00	00	17
4	50-60	02	08	06	08	08	32
5	Total	60	17	07	08	08	100

Table 4: Voiding difficulty in patients according to sex

Sr no	Sex	G0	G1	G2	G3	G4	Total
1	Male	47	14	04	08	07	80
2	Female	13	03	03	00	01	20
3	Total	60	17	07	08	08	100

DISCUSSION

In our study we studied 100 patients undergoing spinal anaesthesia. Mean age of the patients was 49.3 ± 3.1 years. Majority of the patients were from the age group of 50-60 years (32%) followed by 30-39 years (30%). In our study, 80% of the patients were male and 20% patients were female. Male to female ratio was 4:1. In our study, Majority of the patients had spontaneous Voiding without difficulty G0 (60%). Voiding with difficulty (G1) was observed in 17% patients. Intermittent single evacuation of bladder (G2) was seen in 7% patients. Intermittent repeated evacuation of bladder (G3) was observed in 8% patients. Continuous catheterization was seen in 8% patients. Thus in our study incidence of post operative urinary retention was 40%. In our study we found that as the age increases there is increase in voiding difficulty of urine in the patients post operatively. Significant increase in the voiding difficulty in patients with increase in age was observed in our study ($p < 0.05$). In a study conducted by Lee and colleagues (2007)^{6,7} it was demonstrated that post operative urinary retention increases with age and the risk increases by 2.4 to 2.6 time in patients over 50 years of age is due to progressive neuronal degeneration leading to bladder dysfunction.^{5,6} In a study undertaken by Hollma *et al.*, 376 men undergoing hip arthroplasty were assessed for post operative urinary retention (defined in their study as inability to void after surgery for which single or indwelling catheter is required) it was demonstrated that that increasing age was an independent risk factor for POUR.⁷ This is similar to finding in our study where we found that incidence of grade 3 and grade 4 voiding problems, that is need for frequent evacuations and / or persistent catheterization was most prevalent in patients having age more than 50 years, where as it was negligible in younger patients. In our study, when comparison of different age groups was done in relation to requirement of catheterization for voiding difficulty, it was found that, none of the subjects in 20-29 and 30-39 years required catheterization. While in age group of 40-49 years catheterization rate was 5.8% and in the age group of 50-60 years it was 68.7%. Among male majority 47(58.75%) were not having any difficulty in voiding urine. 14 patients had grade 1 voiding difficulty and 4 patients had grade 2 voiding difficulty. In females 65% females did not have any difficulty in voiding urine after spinal anaesthesia. Males show higher incidence of difficulty in voiding urine than females but the difference was not statistically significant ($p > 0.05$). In a study conducted by Tammela *et al.* (1986)⁸, it was found that higher incidence of post operative urinary retention has been reported in males as compared to women.^{5,8,9} The difference thus found has already been found probably due to gender specific pathologies such as benign prostatic hypertrophy

in males.^{10,11} Possible reasons for sex related differences in urinary tract anatomy and physiology between male and female. Male urethra is longer and more tortuous than female urethra. There is also a presence of prostate in male which may enlarge in benign prostatic hypertrophy, thus obstructing to flow of urine. All these factors contribute in increased resistance for urinary flow leading to higher incidence in males.

CONCLUSION

In our study we found that incidence of POUR was more in age >50 years and male sex with incidence of 40%.

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