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Comparison of Complications between Gender during Spinal Anesthesia

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Abstract

Background: The side effects of spinal anesthesia has been the focus of many researchers. These complications can affect patients' satisfaction following surgery and duration of hospitalization. Therefore, factors that lead to increased risk of side effects must be identified, one of these factors is gender. This study evaluated the relationship between gender and adverse effects after spinal anesthesia.

Materials and Methods: In this cohort study, 1200 patients including 600 men and 600 women underwent spinal anesthesia with 5% lidocaine injected into L3-4 or L4-5interspace with the patient in either sitting or lateral position. The subjects include patients scheduled for lower abdominal site and orthopedic surgeries (leg to the bottom), analysis was done at 6, 12, 18, and 24 hours after recovery, and some variables in the second and third days were also analyed. To statistically analyze the side effects of spinal anesthesia, chi-square test was used.

Result: Result showed that nausea, vomiting, headache, urinary retention (in recovery unit) and back pain (18hours) were statistically significantly different ($P<0.05$). There was no significant difference between the incidence of other complications and gender.

Conclusion: According to this study, gender can lead to differences in the incidence of some complications after spinal anesthesia.

Keywords: Spinal anesthesia; Gender; Adverse effects; Bradypnae; Tachycardia; Hypertension; Hypotension

Introduction

Spinal anesthesia involves the induction of reversible motor function and sensation loss into the subarachnoid space using small amounts of local anesthetic [1]. This anesthesia provider places the needle in the adult patient in a position below L2 to avoid spinal cord trauma [2]. It gave a perfect condition of operation for: surgical protocol below the umbilicus, gynecologic/obstetric procedures of uterus and perineum, hernia repairs, genitourinary procedures, orthopedic procedures from the hip downward [3]. Patients with severe dehydration or hypovolemic should not be subjected to spinal anesthesia[4]. Patients under spinal anesthetic should be preloaded with 1-1.5 liters of a crystalloid solution, such as ringers lactate, immediately prior to the block [5]. Advantages of this type of anesthesia include; easy to perform, reliable, gave good operating conditions for the surgeon, it is inexpensive than general anesthesia, normal gastrointestinal function returns faster with spinal anesthesia [6-8]. Patients maintain a patent airway, a decrease in pulmonary complications compared to general anesthesia, and a decreased incidence of deep vein thrombosis and pulmonary embolism formation compared to general anesthesia [9].The side effects of spinal anesthesia have recently been the area of interest [10]. These complications can affect patients' satisfaction following surgery and duration of hospitalization [11]. Therefore, factors that lead to increased risk side effects must be identified for better patients management after surgery, one of these factors is gender [12]. This study evaluated the relationship between gender and adverse effects including nausea, vomiting, shivering, agitation, tachycardia, bradycardia, hypotension, hypertension, complete spinal block, surgical site pain, bradypnae, headache, back pain, pain during injection of anesthetic, urinary retention, hypothermia, drowsiness and subdural hematoma after spinal anesthesia.

Materials and Methods

This study was carried out at Lorestan University of Medical Sciences (LUMS) teaching hospital, Khoramabad, Iran. In this cohort study, 1200 patients including 600 men and 600 women who went through spinal anesthesia were examined (Table 1). The subject are grouped into two, 600 were administered with 5% lidocaine which was injected into L3-4 or L4-5 interspace with the patient in either sitting or lateral position. The subjects include patients scheduled for lower abdominal site and orthopedic surgeries (leg to the bottom), analysis was done at 6, 12, 18, and 24 hours after recovery, and some variables in the second and third days were

examined. Amongst the women, 286 (47.7%) patients underwent lower abdominal surgery and 314 (53.2%) patients underwent orthopedic surgery. Amongst the men, 224 (37.3%) patients underwent lower abdominal surgery and 367 (62.7%) patients underwent orthopedic surgery. Eligible patients were enrolled, and a written informed consent was obtained prior to the study. Inclusion criteria in the study was the possibility of surgery with spinal anesthesia, ASA CLASS I, the absence of any systemic disease and aged between 18 to 65 years as to the type of surgery. Patients who went through orthopedic surgery of the lower abdomen, and legs down to the bottom were selected. The combination of patients by age and type of surgery was also performed. In this study, before the onset of spinal anesthesia, systolic blood pressure (SBP), heart rate (HR), respiratory rate (RR) and body temperature were measured. The first spinal anesthesia was administered with catheter to the vessel where 18 and 20cc/Kg of ringer lactated solution was received. Spinal anesthesia was performed with 5% lidocaine injected into L3-4 or L4-5 interspace with the patient in either sitting or lateral position, this standard procedure was performed by an anesthesiologist. Patients with more than one attempt of spinal anesthesia were excluded.

Group	The frequency of lower abdominal surgery	The frequency of orthopedic surgery	Total Number (percent)
Men	224 (37.3)%	376 (62.7)%	600 (100%)
Women	314 (52.3)%	286 (47.7)%	600 (100%)

Table 1: Distribution of surgical procedures by gender

Eligible patients at the time of recovery after surgery, at 6, 12, 18 and 24hours and also on the second and third postoperative complications were followed by dialogue through questionnaires (Table 2). Patients with hypertension complication had 20% increase in SBP. Lower body temperature of 36.5 ºC was considered as hypothermia. HR of 100 beats per minute, ≤ 55, ≥ 55

Complications	Group	Present (percent)	Absent (percent)	Total Number (percent)	P-value
Hypertension	Male Female Total	19 (3.2%) 30(5%) 49 (4.1%)	581(96.8%) 570(95%) 1101(95.9%)	600(100%) 600(100%) 1200(100%)	0.109
Hypotension	Male Female Total	13(2.2%) 12(2%) 25(2.1%)	587(97.8%) 588(98%) 1175(97.9%)	600(100%) 600(100%) 1200(100%)	0.840
Tachycardia	Male Female Total	22(3.7%) 26(4.3%) 48(4%)	578(96.3%) 574(95.7%) 1102(96%)	600(100%) 600(100%) 1200(100%)	0.555
Bradycardia	Male Female Total	20(3.3%) 16(2.7%) 36(3%)	580(96.7%) 584(97.3%) 1164(97%)	600(100%) 600(100%) 1200(100%)	0.498
Nausea	Male Female Total	57(9.5%) 91(15.2%) 148(12.3%)	543(90.5%) 509(84.8%) 1052(87.7%)	600(100%) 600(100%) 1200(100%)	0.003
TNS	Male Female Total	4(0.7%) 4(0.7%) 8(0.7%)	596(99.3%) 596(99.3%) 1192(99.3%)	600(100%) 600(100%) 1200(100%)	1.000
Shriving	Male Female Total	24(4%) 36(6%) 60(5%)	576(96%) 564(94%) 1160(95%)	600(100%) 600(100%) 1200(100%)	0.112
back ache	Male Female Total	7(1.2%) 14(2.3%) 21(1.8%)	593(98.8%) 586(97.7%) 1179(98.2%)	600(100%) 600(100%) 1200(100%)	0.313
Drowsiness	Male Female Total	21(3.5%) 15(2.5%) 36(3%)	579(96.5%) 585(97.5%) 1164(97%)	600(100%) 600(100%) 1200(100%)	0.310
Fidget	Male Female Total	8(1.3%) 10(1.7%) 18(1.5%)	592(98.7%) 590(98.3%) 1182(98.5%)	600(100%) 600(100%) 1200(100%)	0.635
Urinary retention	Male Female Total	73(12.2%) 60(10%) 133(11.1%)	528(87.8%) 540(90%) 1067(88.9%)	600(100%) 600(100%) 1200(100%)	0.232
Hypothermia	Male Female Total	19(3.2%) 20(3.3%) 39(3.2%)	581(96.8%) 580(96.7%) 1161(96.8%)	600(100%) 600(100%) 1200(100%)	0.871
Bradypoenea	Male Female Total	3(0.5%) 6(1%) 9(0.8%)	597(99.5%) 594(99%) 1191(99.2%)	600(100%) 600(100%) 1200(100%)	0.315

Table 2: Distribution of subjects based on the incidence of different parameters at different times based on gender

beats/mins, were for tachycardia and bradycardia respectively. A smaller RR of 12/mins for bradypnae. In the study, inability to retain urine or bladder without volume of 600 mL was indicative of the occurrence of this complication. Nausea, and epigastric discomfort in the stomach,the ratings of the severity of this complication include: no nausea, (0), mild nausea and tolerable (1), annoying nausea (2). Vomiting of stomach contents as well as withdrawal was also evaluated, scoring include: no vomiting (0), 1 or 2 times vomiting (1) and more than 2 turns of vomiting (2). The feelings of pain at surgical site ratings were done using the Visual Analogue Scale (VAS) scores based on the Verbal Descriptor Scale (VDS), these include; painless (0), brief pain (1-3), moderate pain (4-7), pain (8, 9) and very severe and unbearable pain (10). Headache, especially in the frontal and occipital region were rated as; no headaches (0), headache (1-3), moderate headache (4-7), headache (8, 9) and severe and unbearable headache (10). The headache gets worse with walking and sitting, lying down is better. It can also bring about nausea and vomiting. These complications may occur 24 hours after surgery, so patients were followed in second and third days. Transient neurological disorder as well as any dizzy feeling, numbness in the buttock and lower extremities were studied. Since these side effects may occur after 24 hours, patients were followed in second and third day. Restlessness was also felt and the need was irresistible, mental instability and movement. The patient felt pain during anesthesia because of the liquid administered on the lower limbs. A T4 segment sensory level, above which is complication during spinal anesthesia, hypotension and bradycardia were also examined. Shivering and vibratory motions of head, and limbs were evaluated. Back pain in the lumbar spine after anesthesia was examined, this pain was rated on VAS at VDS scores graded as; painless (0), brief pain (1-3), moderate pain (3-7), pain (7-9) and very severe and unbearable pain (10). The need for patients' intervention were evaluated as well, if the surgical site pain score is greater than 4, treatment with pethidine injection 1mg/kg was allowed. In the case of post spinal headache, 50 mg diclofenac for patients below 50 kg, and 100 mg for patients greater than 50 kg was used. If nausea and vomiting occurred, metoclopramide was administered, a score of more than 2 is assigned. In case of chills and muscle injection, 25 mg pethidine was administered. In case of hypothermia, patients were capped with more blankets.

After sufficient control of pain, patients are regarded as ready in accordance with the Departmental protocol. Patients cardiopulmonary was stable and their spinal anesthesia level sensory residual was < S1.

Statistical Analysis

After collecting the questionnaires, data analysis of incidence between the two sexes were compared after spinal anesthesia. Statistical analysis was carried out using a multivariate regression analysis. Chi-square test was used to analyze the incidence of complications.

Results

In this cohort study where 600 patients were female and 600 were male. Analysis was done at 6, 12, 18, and 24hours after recovery, for some variables, such as headache and pain in the second and third days were studied. Table 3 shows the incidence of hypertension in men and women, which was 19 patients (2.3%), and 30 (5%) respectively, there was no significant difference was observed between incidence of hypertension and gender (P=0.109). The incidence of hypotension in men and women was 13 patients (3.2%) and 12 patients (2.2%) respectively, there was no significant difference between hypotension and gender (P=0.840) (Table 3). The incidence of tachycardia in men and women was 22 patients (3.7%) and 26 patients (4.3%) respectively, there was no significant difference between tachycardia and gender (P=0.555) (Table 3). The incidence of bradycardia in men and women was 20 patients (3.3%) and 16 patients (2.7%) respectively, there was no statistically significantly difference between gender and bradycardia incidence (P=0.498) (Table 3). The incidence of nausea in men and women was 57 patients (9.5%) and 91 (15.2%) respectively (P=0.004) (Table 3). The incidence of vomiting in men and women was 34 (6.3%), and 60 (10%), also average vomiting in men and women was 5 patients (0.8%) and 9 patients (1.5%) (with severe vomiting) respectively, there was a statistically significantly difference observed between incidence of vomiting and gender (P=0.006) (Table 3). The incidence of TNS in men and women was 4 patients (0.7%) and 4 patients (0.7%) respectively, there was no statistically significantly difference observed between TNS and gender (P=0.001) (Table 3). The incidence of shivering in men and women was 24 (4%) and 36 (6%) respectively, there was no statistically significantly difference observed between shivering and gender (P=0.112) (Table 3). The incidence of back pain in men and women was 7 patients (1.2%) and 14 (2.3%) respectively, there was a statistically significantly difference observed between back pain and gender (P=0.313), but, significant difference was observed 18 hours after surgery (P=0.014) (Table 3). The incidence of restlessness in men and women was 8 (1.3%) and 10 (1.7%) respectively, there was no statistically significantly difference observed between restlessness and gender (P=0.635) (Table 3). The incidence of urinary retention in men and women was 73 (12.2%), and 60 (10%) respectively, there was a statistically significantly difference observed between urinary retention and gender (P<0.05) (Table 3). The incidence of hypothermia in men and women was 19 (3.2%) and 20 (3/3%) respectively, there was no statistically significantly difference observed between hypothermia and gender (P=0.871) (Table 3). The incidence of bradypnae in men and women was 3 (0.5%) and 6 (1%), respectively, there was no statistically significantly difference observed between bradypnae and gender (P= 0.315). The incidence of mild headache in men and women was 28 (1.4%) and 60 (2.10%), they score 1 and 3 respectively (Table 3). The incidence of average headache in men and women was 9 (1.5%) and 6 (1%), they score between 4 and 7 respectively. The incidence of headache in men and women was 3 (0.5%) and 11 (1.8%), they score of 8 and 9 respectively, a significant different was observed between sex and headaches (P=0.245) (Table 4). The incidence of mild pain in men and women was 26 (4.3%) and 22 (3.7%) respectively at the surgical site. The incidence of moderate pain in men and women was 4 (0.7%) and 7 (1.2%) respectively at surgical site.

Distribution of subjects based on the incidence of hypertension at different times based on gender					
Time	**Group**	**Present (percent)**	**Absent (percent)**	Total Number (percent)	P-value
Recovery	Male Female Total	6 (1%) 7 (1.2%) 13 (1.2%)	594 99 593 98.8 1187 98.8	600(100%) 600(100%) 1200(100%)	0.780
6 hours	Male Female Total	5 (0.8%) 8 (1.3%) 13 (1.2%)	595 99.2 592 98.7 1187 98.8	600(100%) 600(100%) 1200(100%)	0.403
12 hours	Male Female Total	2 (0.3%) 5 (0.8%) 7 (0.6%)	598 98.7 595 98.2 1193 99.4	600(100%) 600(100%) 1200(100%)	0.255
18 hours	Male Female Total	4 (0.7%) 7 (1.2%) 11 (0.9%)	596 99.3 593 98.8 1189 99.1	600(100%) 600(100%) 1200(100%)	0.364
24 hours	Male Female Total	2 (0.3%) 3 (0.5%) 5 (0.4%)	598 99.7 597 99.5 1195 99.6	600(100%) 600(100%) 1200(100%)	0.654
Distribution of subjects on the basis of Hypotension at different times based on gender					
Recovery	Male Female Total	9(1.5%) 8(1.3%) 17(1.4%)	591(98.5%) 592(98.7%) 1183(98.6%)	600(100%) 600(100%) 1200(100%)	0.807
6 hours	Male Female Total	3(0.5%) 2(0.3%) 5(0.4%)	597(99%) 598(99.7) 1195(99.6)	600(100%) 600(100%) 1200(100%)	0.654
12 hours	Male Female Total	0(0%) 0(0%) 0(0%)	0(0%) 0(0%) 0(0%)	600(100%) 600(100%) 1200(100%)	-
18 hours	Male Female Total	1(0.2%) 2(0.3%) 3(0.2%)	599(99.8%) 598(99.7%) 1197(99.8)	600(100%) 600(100%) 1200(100%)	0.563
24 hours	Male Female Total	0(0%) 0(0%) 0(0%)	0(0%) 0(0%) 0(0%)	600(100%) 600(100%) 1200(100%)	-
Distribution of subjects based on the incidence of tachycardia at different times based on gender					
Recovery	Male Female Total	10(1.7%) 8(1.3%) 18(1.5%)	590(98.3%) 592(98.7%) 1182(98.5%)	600(100%) 600(100%) 1200(100%)	0.827
6 hours	Male Female Total	7(1.2%) 8(1.3%) 15(1.2%)	593(98.8%) 592(98.7%) 1185(98.8%)	600(100%) 600(100%) 1200(100%)	0.693
12 hours	Male Female Total	6(1%) 9(1.5%) 15(1.2%)	594(99%) 591(98.5%) 15(1.2%)	600(100%) 600(100%) 1200(100%)	0.738
18 hours	Male Female Total	6(1%) 1(0.2%) 7(0.6%)	594(99%) 599(99.8%) 1193(99.4)	600(100%) 600(100%) 1200(100%)	0.166
24 hours	Male Female Total	3(0.5%) 0(0%) 3(0.2%)	597(99.5%) 600(100%) 1197(99.8%)	600(100%) 600(100%) 1200(100%)	0.081
Distribution of subjects based on the incidence of bradycardia at different times based on gender					
Recovery	Male Female Total	15(2.5%) 13(2.2%) 28(2.3%)	585(97.5%) 587(97.8%) 1172(97.7%)	600(100%) 600(100%) 1200(100%)	0.827
6 hours	Male Female Total	4(0.7%) 2(0.3%) 6(0.5%)	596(99.3%) 598(99.7%) 1194(99.5%)	600(100%) 600(100%) 1200(100%)	0.693
12 hours	Male Female Total	2(0.3%) 2(0.3%) 4(0.3%)	598(99.7%) 598(99.7%) 1196(99.7%)	600(100%) 600(100%) 1200(100%)	0.738
18 hours	Male Female Total	1(0.2%) 1(0.2%) 2(0.2%)	599(99.8%) 599(99.8%) 1198(99.8%)	600(100%) 600(100%) 1200(100%)	0.166

24 hours	Male Female Total	2(0.3%) 0(0%) 2(0.2%)	598(99.7%) 600(100%) 1198(99.8%)	600(100%) 600(100%) 1200(100%)	0.081
Distribution of subjects based on the incidence of nausea at different times based on gender					
Recovery	Male Female Total	20(3.3%) 5(0.8%) 25(2%)	580(99.7%) 595(99.2%) 1175(98%)	600(100%) 600(100%) 1200(100%)	0.002
6 hours	Male Female Total	22(3.7%) 24(4%) 46(3.8%)	578(96.3%) 576(96%) 1154(96.2%)	600(100%) 600(100%) 1200(100%)	0.724
12 hours	Male Female Total	9(1.5%) 39(6.5%) 48(4%)	591(98.5%) 561(93.5%) 1161(96%)	600(100%) 600(100%) 1200(100%)	0.000
18 hours	Male Female Total	5(0.8%) 17(2.8%) 29(2.4%)	595(99.2%) 583(97.2%) 1171(97.6%)	600(100%) 600(100%) 1200(100%)	0.010
24 hours	Male Female Total	1(0.2%) 6(1%) 7(0.6%)	599(99.8%) 594(99%) 1193(99.4%)	600(100%) 600(100%) 1200(100%)	0.058
Distribution of subjects based on the incidence of nausea and vomiting at different times based on gender					
Recovery	Male Female Total	595(99.2%) 600(100%) 1195(99.6%)	0(0%) 0(0%) 0(0%)	600(100%) 600(100%) 1200(100%)	0.025
6 hours	Male Female Total	588(98%) 568(94.6%) 1156(96.3%)	1(0.2%) 1(0.2%) 2(0.2%)	600(100%) 600(100%) 1200(100%)	0.007
12 hours	Male Female Total	587(97.8%) 578(96.4%) 1156(97%)	1(0.2%) 2(0.3%) 3(0.3%)	600(100%) 600(100%) 1200(100%)	0.301
18 hours	Male Female Total	593(98.8%) 584(97%) 1177(98%)	1(0.2%) 4(0.7%) 5(0.4%)	600(100%) 600(100%) 1200(100%)	0.078
24 hours	Male Female Total	594(99%) 594(99%) 1188(99%)	2(0.3%) 1(0.2%) 2(0.3%)	600(100%) 600(100%) 1200(100%)	0.801
Overall	Male Female Total	557(92.9%) 531(88.5%) 1088(90.6%)	5(0.8%) 9(1.5%) 14(1.2%)	600(100%) 600(100%) 1200(100%)	0.006
Distribution of subjects based on transient neurological symptoms at different times based on gender					
Recovery	Male Female Total	0(0%) 0(0%) 0(0%)	600(100%) 600(100%) 1200(100%)	600(100%) 600(100%) 1200(100%)	-
6 hours	Male Female Total	2(0.3%) 1(0.2%) 3(0.7%)	598(99.8%) 599(99.8%) 1197(99.3%)	600(100%) 600(100%) 1200(100%)	0.563
12 hours	Male Female Total	4(0.7%) 3(0.5%) 7(0.6%)	596(99.3%) 597(99.5%) 1193(99.4%)	600(100%) 600(100%) 1200(100%)	0.705
18 hours	Male Female Total	4(0.7%) 3(0.5%) 7(0.6%)	596(99.3%) 597(99.5%) 1193(99.4%)	600(100%) 600(100%) 1200(100%)	-
24 hours	Male Female Total	1(0.2%) 2(0.3%) 3(0.7%)	599(99.8%) 598(99.7%) 1197(99.3%)	600(100%) 600(100%) 1200(100%)	0.563
Distribution of subjects based on shivering at different times based on gender					
Recovery	Male Female Total	16(2.7%) 19(3.2%) 35(2.9%)	584(97.3%) 581(96.8%) 1165(97%)	600(100%) 600(100%) 1200(100%)	0.607
6 hours	Male Female Total	5(0.8%) 9(1.5%) 14(1.2%)	595(99.2%) 591(98.5%) 1186(98.8%)	600(100%) 600(100%) 1200(100%)	0.282

12 hours	Male Female Total	0(0%) 1(0.2%) 1(0.008%)	600(100%) 599(99.8%) 1199(99.2%)	600(100%) 600(100%) 1200(100%)	0.317
18 hours	Male Female Total	1(0.2%) 3(0.5%) 4(0.3%)	599(99.8%) 597(99.5%) 1196(99.7%)	600(100%) 600(100%) 1200(100%)	0.317
24 hours	Male Female Total	1(0.2%) 4(0.7%) 5(0.4%)	599(99.8%) 596(99.3%) 1195(99.6%)	600(100%) 600(100%) 1200(100%)	0.179
Distribution of subjects based on the incidence of low back pain at different times based on gender					
Recovery	Male Female Total	0(0%) 1(0.2%) 1(0.08%)	600(100%) 599(99.8%) 1199(99.92%)	600(100%) 600(100%) 1200(100%)	0.123
6 hours	Male Female Total	4(0.7%) 9(1.5%) 13(1.1%)	596(99.3%) 591(98.5%) 1187(98.9%)	600(100%) 600(100%) 1200(100%)	0.094
12 hours	Male Female Total	2(0.3%) 7(1.2%) 9(0.5%)	598(99.7%) 593(98.8%) 1191(99.5%)	600(100%) 600(100%) 1200(100%)	0.163
18 hours	Male Female Total	0(0%) 6(1%) 6(0.5%)	600(100%) 594(99%) 1194(99.5%)	600(100%) 600(100%) 1200(100%)	0.014
24 hours	Male Female Total	1(0.2%) 6(1%) 7(0.6%)	599(99.8%) 594(99%) 1193(99.4%)	600(100%) 600(100%) 1200(100%)	0.058
Distribution of the subjects on the basis of restlessness at different times based on gender					
Recovery	Male Female Total	1(0.2%) 2(0.3%) 3(0.2%)	599(99.8%) 598(99.7%) 1197(99.8%)	600(100%) 600(100%) 1200(100%)	0.563
6 hours	Male Female Total	2(0.3%) 3(0.5%) 5(0.4%)	598(99.5%) 597(99.5%) 1195(99.6%)	600(100%) 600(100%) 1200(100%)	0.654
12 hours	Male Female Total	0(0%) 0(0%) 0(0%)	600(100%) 600(100%) 1200(100%)	600(100%) 600(100%) 1200(100%)	-
18 hours	Male Female Total	4(0.7%) 5(0.8%) 9(0.7%)	596(99.3%) 595(99.2%) 1191(99.3%)	600(100%) 600(100%) 1200(100%)	0.738
24 hours	Male Female Total	1(0.2%) 0(0%) 1(0.08%)	599(99.8%) 600(100%) 1199(99.92%)	600(100%) 600(100%) 1200(100%)	0.317
Distribution of subjects based on the incidence of urinary retention at different times based on gender					
Recovery	Male Female Total	32(5.3%) 13(2.2%) 45(3.8%)	568(94.7%) 587(97.8%) 1100(96.3%)	600(100%) 600(100%) 1200(100%)	0.004
6 hours	Male Female Total	26(4.3%) 36(6%) 62(5.2%)	574(95.7%) 464(94%) 1138(94.8%)	600(100%) 600(100%) 1200(100%)	0.192
12 hours	Male Female Total	3(0.5%) 7(1.2%) 10(0.8%)	597(98.5%) 593(98.8%) 1190(99.2%)	600(100%) 600(100%) 1200(100%)	0.204
18 hours	Male Female Total	7(1.2%) 4(0.7%) 11(0.9%)	593(99.8%) 596(99.3%) 1189(99.1%)	600(100%) 600(100%) 1200(100%)	0.364
24 hours	Male Female Total	5(0.8%) 0(0%) 5(0.4%)	595(99.2%) 600(100%) 1190(99.6%)	600(100%) 600(100%) 1200(100%)	0.075
Distribution of subjects based on the incidence of hypothermia at different times based on gender					
Recovery	Male Female Total	17(2.8%) 10(1.7%) 27(2.2%)	583(97.2%) 590(98.3%) 1173(98.8%)	600(100%) 600(100%) 1200(100%)	0.173

6 hours	Male Female Total	3(0.5%) 1(0.2%) 4(0.3%)	597(99.5%) 599(99.8%) 1196(99.7%)	600(100%) 600(100%) 1200(100%)	0.968
12 hours	Male Female Total	0(0%) 3(0.5%) 3(0.2%)	600(100%) 597(99.5%) 1197(99.8%)	600(100%) 600(100%) 1200(100%)	0.083
18 hours	Male Female Total	0(0%) 5(0.8%) 5(0.4%)	600(100%) 595(99.2%) 1195(99.6%)	600(100%) 600(100%) 1200(100%)	0.055
24 hours	Male Female Total	0(0%) 2(0.3%) 2(0.2%)	600(100%) 598(99.7%) 1198(99.8%)	600(100%) 600(100%) 1200(100%)	0.157
Distribution of subjects based on bradypenea at different times based on gender					
Recovery	Male Female Total	3(0.5%) 4(0.7%) 7(0.6%)	597(99.5%) 596(99.3%) 1193(96.4%)	600(100%) 600(100%) 1200(100%)	0.899
6 hours	Male Female Total	0(0%) 0(0%) 0(0%)	600(100%) 600(100%) 1200(100%)	600(100%) 600(100%) 1200(100%)	-
12 hours	Male Female Total	0(0%) 0(0%) 0(0%)	600(100%) 600(100%) 1200(100%)	600(100%) 600(100%) 1200(100%)	-
18 hours	Male Female Total	0(0%) 2(0.3%) 2(0.2%)	600(100%) 600(99.7%) 1198(99.8%)	600(100%) 600(100%) 1200(100%)	0.217
24 hours	Male Female Total	4(0.3%) 0(0%) 0(0%)	0(0%) 0(0%) 1200(100%)	600(100%) 600(100%) 1200(100%)	-

Table 3: Distribution of subjects based on the incidence of different parameters at different times based on gender

Time	Group	No headache (percent)	Mild headache (percent)	Average headache (percent)	Severe headache (percent)	Total Number (percent)	P-value
Recovery	Male Female Total	598(99.7%) 599(99.8%) 1197(99.7%)	1(0.2%) 1(0.2%) 2(0.2%)	1(0.2%) 0(0%) 1(1%)	0(0%) 0(0%) 0(0%)	600(100%) 600(100%) 1200(100%)	0.606
6 hours	Male Female Total	598(99.7%) 596(99.3%) 1194(99.5%)	2(0.3%) 4(0.7%) 6(0.5%)	0(0%) 0(0%) 0(0%)	0(0%) 0(0%) 0(0%)	600(100%) 600(100%) 1200(100%)	0.413
12 hours	Male Female Total	591(99.5%) 592(98.7%) 1183(98.6%)	8(1.3%) 7(1.2%) 15(1.2%)	1(0.2%) 0(0%) 1(0.1%)	0(0%) 1(0.2%) 1(0.1%)	600(100%) 600(100%) 1200(100%)	0.599
18 hours	Male Female Total	592(98.7%) 573(95.5%) 1165(97.1%)	4(0.7%) 22(3.7%) 26(2.2%)	4(0.7%) 1(0.2%) 5(0.4%)	0(0%) 4(0.7%) 4(0.3%)	600(100%) 600(100%) 1200(100%)	0.559
24 hours	Male Female Total	589(98.2%) 574(95.7%) 1163(97%)	6(1%) 19(3.2%) 25(2.1%)	2(0.3%) 1(0.2%) 3(0.2%)	3(0.5%) 6(1%) 9(0.7%)	600(100%) 600(100%) 1200(100%)	0.040
Second day	Male Female Total	590(98.3%) 586(97.7%) 1176(98%)	7(1.2%) 9(1.5%) 16(1.3%)	3(0.5%) 5(0.8%) 8(0.7%)	0(0%) 0(0%) 0(0%)	600(100%) 600(100%) 1200(100%)	0.683
Third day	Male Female Total	590(98.3%) 589(98.2%) 1179(98.2%)	8(1.3%) 9(1.5%) 17(1.4%)	2(0.3%) 2(0.3%) 4(0.3%)	0(0%) 0(0%) 0(0%)	600(100%) 600(100%) 1200(100%)	0.971
Overall	Male Female Total	560(93.3%) 522(87%) 1082(90.1%)	28(4.7%) 61(10.2%) 89(7.4%)	9(1.5%) 6(1%) 10(1.3%)	3(0.5%) 11(1.8%) 14(1.2%)	600(100%) 600(100%) 1200(100%)	0.000

Table 4: Distribution of subjects based on the occurrence of headache and headache intensity at different times based on gender

The incidence of severe pain in men and women was 5 (0.8%) respectively in the surgical area, but, men did not complain of severe pain at the surgical site, there was no significant difference observed between incidence of surgical pain and gender (P=0.245) (Table 5). Pain observed during the injection of anesthetic was 5 (0.8%) in men and 6 (1%) in women, there was no significant difference observed between gender and pains while injecting a local anesthesia (P=0.762) (Table 6).

Time	Group	No pain	Mild pain	Average pain (percent)	Severe pain (percent)	Total Number (percent)	P-value
Recovery	Male Female Total	599(99.8%) 597(99.3%) 1196(99.7%)	1(0.2%) 3(0.5%) 4(0.3%)	0(0%) 0(0%) 0(0%)	0(0%) 0(0%) 0(0%)	600(100%) 600(100%) 1200(100%)	0.366
6 hours	Male Female Total	589(98.2%) 586(97.5%) 1175(98%)	11(1.8%) 13(2.2%) 24(2%)	0(0%) 1(0.2%) 1(0.1%)	0(0%) 0(0%) 0(0%)	600(100%) 600(100%) 1200(100%)	0.536
12 hours	Male Female Total	591(98.5%) 588(98%) 1179(98.3%)	8(1.3%) 6(1%) 14(1.2%)	1(0.2%) 3(0.5%) 4(0.3%)	0(0%) 3(0.5%) 3(0.2%)	600(100%) 600(100%) 1200(100%)	0.231
18 hours	Male Female Total	595(99.2%) 596(99.2%) 1191(99.3%)	3(0.5%) 0(0%) 3(0.2%)	2(0.3%) 3(0.5%) 5(0.4%)	0(0%) 1(0.2%) 1(0.1%)	600(100%) 600(100%) 1200(100%)	0.241
24 hours	Male Female Total	597(99.5%) 599(99.8%) 1196(99.7%)	3(0.5%) 0(0%) 3(0.2%)	0(0%) 0(0%) 0(0%)	0(0%) 1(0.2%) 1(0.1%)	600(100%) 600(100%) 1200(100%)	0.135
Overall	Male Female Total	570(95%) 568(94.7%) 1138(94.8%)	26(4.3%) 22(3.7%) 48(4%)	4(0.7%) 7(1.2%) 11(0.8%)	0(0%) 5(0.8%) 5(0.4%)	600(100%) 600(100%) 1200(100%)	0.240

Table 5. Distribution of subjects based on pain and surgical pain postoperatively at different times based on gender

Variable	Group	Number present	Mild pain	Total Number (percent)	P-value
Pain during anesthesia	Men	595(99.2)%	5(0.8)%	600 (100%)	0.762
	Women	594 (99)%	6(1)%	600 (100%)	
	Total	1189(99.1%)	11(0.9%)	1200(100%)	

Table 6. Distribution of subjects based on the occurrence of pain during injection numbness and pain intensity at different times based on gender

Discussion and Conclusion

The present study examined the relationship between gender and adverse effects after spinal anesthesia with lidocaine. In this study, statistical analysis of the 19 variables studied showed a significant difference between the incidence of 5 variables and gender of patients. These variables include vomiting, nausea, headache, urinary retention and back pain after spinal anesthesia [13]. The incidence of nausea in men and women was 57 patients (9.5%) and 91 (15.2%) respectively (P=0.004). The incidence of vomiting in men and women was 34 (6.3%), and 60 (10%), also average vomiting in men and women was 5 patients (0.8%) and 9 patients (1.5%) (with severe vomiting) respectively, there was a statistically significantly difference observed between incidence of vomiting and gender (P=0.006). In a meta-analysis study conducted by Apfel *et al.* [14], they found that female gender can be a risk factor for nausea and vomiting following spinal anesthesia. In another study conducted by Koivuranata *et al.* nausea and vomiting are the most important, and most common complications introduced [15]. Risk factors such as gender, gynecologic surgery or duration of surgery more than 60 minutes can cause this complications. In a study by Quinn *et al.* incidence of PONV in women and men were 46% and 26% respectively [16]. Sinclair *et al.* in a study of the incidence of nausea found that, it was 28% and 14% in women and men respectively, 17% and 7% incidence of vomiting was reported in women and men respectively [17]. Among the factors that could lead to an increasing incidence of this complication in the female gender is the menstrual cycle [18]. In a study conducted by Vanden *et al.* they found that there is mutual relationship between anxiety and the incidence of PONV after surgery [19]. Since restlessness is more common in women, incidence of PONV can be higher [20]. In the present study, the incidence of mild pain in women and men was 10.2% and 4.7% respectively, the occurrence of average headache average was 1% and 1.5% in women and men respectively, the incidence of severe headache in women and men were 1.8% and 0.5%, respectively. As a result, there was a significant relationship between gender and headache (P<0.05).

In a study conducted by Dripps *et al.* the incidence of headache in women was twice that of men which are 14% and 7% respectively [21]. In another study by Spencer *et al.*, the incidence of headache in women and men was 12% and 7% respectively. Kang *et al.* found the occurrence of headache in women and men to be 13.4% and 5.7% respectively, suggesting that sex can be a crucial factor in the development of headache, there was a similarity between these studies and the present study, showing a direct relationship between sexes, nausea, vomiting and headache [22,23]. There are several factors accounting for this difference between the sexes expressed. One of these causes more tension headaches and migraines among women [24]. Conversely, women may be more sensitive to experimental pain tolerance than men [25]. Among the causes, sex hormones can also increase the incidence of this complication among women [26].

The incidence of back pain in men and women was 7 patients (1.2%) and 14 (2.3%) respectively, there was a statistically significantly difference observed between back pain and gender (P=0.313), but, significant difference was observed 18 hours after surgery (P=0.014) [27]. It should be noted that different factors accounts for back pain after spinal anesthesia [28]. Previous history of the

cause of back pain include; how the needles are inserted for spinal anesthesia, muscle strength presented, and risk factors for lower back pain [29]. Perhaps because women have less muscle mass, tendons becomes more flexible due to the presence of female sex hormones and lumbar lordosis, which accounts for more pain they are experiencing [30].

The incidence of urinary retention in men and women was 73 (12.2%), and 60 (10%) respectively, there was a statistically significantly difference observed between urinary retention and gender ($P<0.05$). In a study by Keita *et al.*(14), as well as Stallard *et al.*, about comparison between gender and incidence of urinary retention, there was no significant difference observed. According to the survey conducted by Axelsson *et al.*, and Tammela *et al.*, sex can be considered a risk factor for the occurrence of headache. This may explain the significant relationship between genders and increase incidence of urinary retention upon recovery [31-34]. Most men do had non-urological surgery after experiencing urinary retention, and the incidence is also high. It is better to know that the main cause of many cases of hypertrophy is not prostatic [35]. It causes an imbalance in the mechanisms and structure of the male body, effects of several kinds of surgery, anesthesia and post-operative care is different [36]. Usually people urinates after surgery until they have to spend time. These people are not able to move due to multiple IV routes. If you can't urinate when lying down or sitting on the bed. Privacy to urinate is often absent in many hospitals which itself may be the delay in urination. When you want to urinate due to pain, especially the lower abdominal pain, muscle relaxes, and prevents the reflux of urine, this can cause pain to start. The rapid infusion of IV fluids during and after surgery led to the fast filling of the bladder [37]. All these factors cause a greater retention in male urine [38]. So it is better for men in recovery, to be attracted with the most attention. Because usually men due to their physiological and psychological structure creates more resistant to these complications and may complain, worsening the condition and creating a vicious cycle. According to this study, gender can give rise to differences in the incidence of some complications after spinal anesthesia of lidocaine, hence, it must therefore be resolved. Incidence of this complication can be predicted, leading to a better management of patients after the surgery.

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Conflict of interest

The authors have no conflict of interest

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