Outcomes of Peripheral Nerve Blocks in Elderly Patients with Fragility Hip Fractures in the Philippine General Hospital: A 6-month Prospective Study

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ABSTRACT

Background and Objective. Hip fractures among the elderly continue to be a serious public health concern. Hip fractures result in extremely painful injuries and given the higher risk of the elderly for complications, managing pain in this population can be challenging. This study aimed to describe the outcomes of peripheral nerve blocks on elderly patients with fragility hip fractures who will undergo elective or emergency hip surgery.

Methods. A single-center prospective cohort study was conducted at the Philippine General Hospital from May 2022 to November 2022. Patients included were aged 60 years old and above with fragility hip fracture, for elective or emergency hip surgery, and with American Society of Anesthesiologists (ASA) Physical Status Score 1–3. Patients' baseline profile, intraoperative characteristics, and postoperative outcomes were collected using a standard data collection form. The data collector was blinded to the type of block performed.

Results. A total of 29 patients who underwent hip surgery were included in the study. Most (65.5%) had Subarachnoid block + Peripheral Nerve Block (SAB+PNB) while 24.1% had General Anesthesia + Peripheral Nerve Block (GA+PNB) and 10.3% had no Peripheral Nerve Block (PNB). The median Numerical Rating Scale (NRS) 30 minutes post block was similar (p=0.977) in those who had PNB blocks (GA+PNB = 0, SAB+PNB = 0). The median NRS at rest during Postoperative day 1 (POD1) was significantly highest (p=0.023) in the No PNB group (3) than in both GA+PNB (0) and SAB+PNB (0). In contrast, the median NRS at rest during POD2 was similar (p=0.713) in the three groups (GA+PNB = 0, SAB+PNB = 0, No PNB = 0). The median NRS at motion during POD1 was significantly highest (p=0.008) in the No PNB group (6) than in both GA+PNB (0) and SAB+PNB (1). Also, the median NRS at motion during POD2 was significantly highest (p=0.009) in No PNB group (4) than in both GA+PNB (0) and SAB+PNB (1). Median Morphine Milligram Equivalent (MME) of postoperative opioid was significantly higher in the No PNB group among the three groups (p=0.047). The median satisfaction score (p=0.210), median delirium score at POD2 (p=0.993), and median length of hospitalization (p=0.173) were all similar in the three groups.

Conclusion. Peripheral nerve block is effective in elderly patients undergoing surgery for fragility hip fractures. It results in lower pain scores and can be administered with equal effectiveness either with general anesthesia or with subarachnoid block. Mortality rate, incidence of delirium, and hospital length of stay did not vary between those with and without peripheral nerve block.

Keywords: peripheral nerve block, regional anesthesia, fragility hip fractures

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INTRODUCTION

Hip fractures among the elderly population continue to be a public health concern. It is estimated that 93 out of every 100,000 Filipinos per year suffer from hip fractures according to the International Osteoporosis Foundation.[1] These fractures are associated with a high burden of costs estimated to be around PhP 1.1 billion a year in the Philippines.[2] The high burden of comorbidities in this demographic leaves these patients with hip fracture vulnerable to the adverse effects of systemic analgesic regimens and are at increased risk of inadequate control of postoperative pain, delirium, delayed return to functional status, and poor postoperative functional outcomes.

Effective pain management in hip fractures is crucial to prevent various morbidities associated with uncontrolled pain. Systemic analgesia includes either opioid or non-opioid therapies. Caution should be practiced in the use of opioids in the elderly population due to the risk of serious adverse effects. On the other hand, the use of non-steroidal anti-inflammatory drugs is limited in the elderly patients due to their side effect profile.[3]

Peripheral nerve blocks have been shown to be superior in terms of perioperative analgesia of patients undergoing hip surgery. Several studies have shown that peripheral nerve blocks in patients with hip fracture reduced pain scores[4-7], reduced opioid requirement[5-9], contributed to reduced rates of delirium[10] and pneumonia[4], and reduced hospital length of stay[11], morbidity, and mortality[4,11,12].

Strategies to improve the outcomes of these patients are necessary. Comprehensive protocols regarding pain control of elderly patients undergoing hip surgery, which integrate evidence-based peripheral nerve blocks, timely and regular pain assessment, and multidisciplinary orthogeriatric care, are needed.

A Cochrane meta-analysis has shown that peripheral nerve blocks reduced pain on movement within 30 minutes of block placement [mean difference of –1.41 (95% CI, –2.14 to –0.67)].[3] Fascia iliaca block (FIB) was found to be superior in terms of pain relief both at rest and on movement.[5] Several randomized controlled trials have shown that FIBs were shown to reduce pain scores (VAS) at zero- and 2nd hour,[6] and preoperatively (10 minutes after blockade) and post-operatively (immediate, 6 hours, and 12 hours postoperatively).[7]

Patients with hip fractures who received peripheral nerve blocks were more satisfied than patients treated with intravenous fentanyl prior to positioning for spinal anesthesia. All said patients who received a nerve block expressed their preference to receive the same management in case of a future operation compared to only 25% of patients who received intravenous fentanyl.[10]

Femoral nerve block was associated with lower mortality among patients with hip fractures than those who did not receive any block.[11] Peripheral nerve blocks were also shown to reduce the risk of pneumonia[4] and fewer episodes of nausea and vomiting.[12]

Patients with hip fractures who received peripheral nerve blocks were shown to have a mean hospital stay of 10 days compared to 15 days among those who did not receive peripheral nerve blocks.[11]

In a meta-analysis, peripheral nerve blocks were shown to reduce the incidence of delirium.[13] However, in the Cochrane review based on seven studies (676 participants), there was no significant difference in the incidence of acute confusional state among elderly patients with hip fractures who underwent peripheral nerve block.[4]

Among the various peripheral nerve blocks, the fascia iliaca block (FIB) and pericapsular nerve group block (PENG block) are the ones usually utilized for hip fractures/ surgeries. The Fascia Iliaca Block (FIB) is a form of femoral nerve block where a large volume of local anesthetic is deposited deep to the fascia iliaca, inferior to the inguinal ligament, and lateral to the femoral artery. Local anesthetic deposited in this compartment spreads to the femoral, obturator, and lateral femoral cutaneous nerves. The Pericapsular Nerve Group Block (PENG Block) is an interfascial place block targeting the articular branches of the femoral, obturator, and accessory obturator nerves supplying the hip joint.

While several local studies[1,2] have explored the outcomes, benefits, and burden associated with fragility hip fractures managed within a multidisciplinary fracture liaison service, there remains a notable gap in the local literature concerning the utilization of peripheral nerve blocks in this context. This study seeks to address this gap by serving as a pilot study into the perioperative use of peripheral nerve blocks for fragility hip fractures under a multidisciplinary fracture liaison service in a tertiary hospital.

The general objective of this study was to describe the anesthetic outcomes of peripheral nerve blocks on elderly patients with fragility hip fracture who will undergo elective or emergency hip surgery. Specific objectives include describing the demographics of elderly who underwent surgery for fragility hip fracture in terms of gender, age, body mass index, ASA physical status, location of fracture, urgency of surgery, duration of surgery, and amount of blood loss. In addition to this, it aims to compare patients who received general anesthesia with peripheral nerve block (GA+PNB), subarachnoid block with peripheral nerve block (SAB+PNB), and conventional analgesia without peripheral nerve blocks on elderly patients for hip surgery based on the following outcomes: pain scores, opioid requirement, patient satisfaction, mortality/ morbidity, hospital length of stay, and incidence of delirium.

MATERIALS AND METHODS

Research Design

This paper was a single-center prospective cohort study conducted at the Philippine General Hospital from May 2022 to November 2022.

Operational Definitions

Fragility Hip Fracture

Fracture of the proximal femur occurring anywhere from the femoral neck to the subtrochanteric region as a result of low-energy trauma in patients aged 60 years old and above

Orthopedic Hip Surgery

Operative treatment for hip fracture which includes internal fixation using plates, pins or screws, or total or partial hip arthroplasty performed by orthopedic surgeons

Peripheral Nerve Block

Form of regional anesthesia in which local anesthetic is injected near or at specific nerve or bundle of nerves to block pain sensation in specific areas of the body. For this paper, peripheral nerve blocks refer to blocks involving nerves supplying the hip joint that include the fascia iliaca block, femoral nerve block, and pericapsular nerve group block

Study Population

Inclusion criteria for this study consisted of:

1. Patients aged 60 years old and above with fragility hip fracture
2. Undergoing elective or emergency hip surgery
3. With American Society of Anesthesiologists (ASA) Physical Status Score 1- 3.

Excluded were those who could not read nor write; had neurodegenerative conditions such as dementia or Alzheimer's disease; and refused to provide informed consent. This was a complete enumeration of patients who qualified using the inclusion criteria stated above.

METHODS

Ethical permission for the conduct of the study was obtained from the Philippine General Hospital Institutional Ethics Review Board. The study shall abide by the Principles of the Declaration of Helsinki (2013) and was conducted along the Guidelines of the International Conference on Harmonization-Good Clinical Practice (ICH-GCP), E6 (R2) and other ICH-GCP 6 (as amended); National Ethical Guidelines for Health and Health Related Research (NEG HHRR) 2017, and the Philippine Data Privacy Act 2012.

Informed consent was obtained from the patients eligible for inclusion by the primary investigator. Among the patients who consented, the anesthesiologist in charge assessed and identified appropriate anesthesia block or conventional anesthesia intervention. The patient then received the appropriate peripheral nerve block either preoperatively or post-operatively, carried out by anesthesiologists at the University of the Philippines Manila-Philippine General Hospital experienced in Regional Anesthesia.

Patients' baseline characteristics were collected using a standard data collection form. The data collector was blinded to the type of block performed. Thirty minutes after the performance of the peripheral nerve block, the patients were assessed for pain score using NRS on movement and at rest. Amount of blood loss and length of surgery were collected from the intraoperative anesthesia record.

At 24 hours and 48 hours post-surgery, patients were assessed for pain score using NRS on movement and at rest. Pain scores above 3 were referred to the nurse in charge of the patients for administration of rescue analgesics. Data on the amount of daily consumed dose of intravenous for pain, converted to morphine sulfate equivalents, at 24 hours and 48 hours was collected from the patients' chart record. Incidence of delirium was assessed using the Delirium Rating Scale-R-98 (DRS-R-98). Patients' level of satisfaction using a Likert scale (1 – very unsatisfied, 2 – unsatisfied, 3 – neutral, 4 – satisfied, 5 – very unsatisfied) was also measured at post-op 48 hours. The patients were then followed up daily to assess for incidence of morbidity and mortality throughout the course of admission.

Patient characteristics were summarized using mean with standard deviation while categorical variables were summarized using frequency and percentage. Non-parametric one-way ANOVA (Kruskal-Wallis Test) was used to compare the pain scores, opioid requirement, patient satisfaction scores, length of hospital stay, and time to positioning across the three groups. Post-hoc analysis was conducted to determine differences between pairs of intervention. Fisher's Exact test was used to compare the incidence of delirium, morbidity, and mortality across the three groups. STATA 14 was used for data analysis. A p-value of <=0.05 was considered significant.

RESULTS

A total of 29 patients who underwent hip surgery were included in the study. Most (65.5%) had SAB+PNB (n = 19) while 24.1% had GA+PNB (n = 7) and 10.3% had no PNB (n = 3). The median age was similar (p=0.898) in the three groups (GA+PNB= 69 years, SAB+PNB= 68 years, No PNB= 67 years). Most of the patients were females (GA+PNB= 57.1%, SAB+PNB= 84.2%, No PNB= 100.0%) (p=0.284). The median BMI was similar (p=0.432) in the three groups (GA+PNB = 22.2, SAB+PNB = 24.7, No PNB = 22.6). The proportion of patients with ASA 3 were comparable (p=0.452) in the three groups (GA+PNB = 57.1%, SAB+PNB = 36.8%, No PNB = 66.7%) (p=0.284). In terms of comorbidities, hypertension (HTN) was reported as follows: GA+PNB = 57.1%, SAB+PNB = 84.2%, No PNB = 66.7% (p=0.322). Prevalence of diabetes mellitus (DM) was reported as follows: GA+PNB= 57.1%, SAB+PNB= 21.1%, No PNB= 33.3% (p=0.218). Other comorbidities were reported as follows: GA+PNB = 71.4%, SAB+PNB = 36.8%, No PNB = 33.3% (p=0.278). Left side fracture was reported

as follows: GA+PNB= 71.4%, SAB+PNB= 68.4%, No PNB= 33.3% (p=0.611). Patient profile is summarized in Table 1.

Most patients had pre-operative block (GA+PNB = 57.1%, SAB+PNB = 68.4%) (p=1.000). Continuous perineural catheter insertion was reported as follows: GA+PNB = 28.6%, SAB+PNB = 26.3% (p=1.000). The proportion of elective surgeries was comparable (p=0.623) in the three groups (GA+PNB = 71.4%, SAB+PNB = 47.4%, No PNB = 66.7%). The median surgery time was similar (p=0.479) in the three groups (GA+PNB = 200 min, SAB+PNB = 124 min, No PNB = 153 min). Also, the median blood loss was similar (p=0.376) in the three groups (GA+PNB = 600 mL, SAB+PNB= 450 mL, No PNB = 400 mL). Perioperative information is summarized in Table 2.

As seen in Table 3, the median NRS 30 min post block was similar (p=0.977) in those who had PNB blocks

Table 1. Demographic and Clinical Characteristics of Patients who Underwent Hip Surgery

Variable	GA+PNB (n=7)	SAB+PNB (n=19)	No PNB (n=3)	*p*-value
Age in years	69 (62-91)	68 (60-85)	67 (64-70)	0.898
Sex				
Female	4 (57.1)	16 (84.2)	3 (100.0)	0.284
Male	3 (42.9)	3 (15.8)	0 (0.0)	
BMI	22.2 (17.8-33.9)	24.7 (18.4-28.9)	22.6 (18.3-24.0)	0.432
ASA				
2	3 (42.9)	12 (63.2)	1 (33.3)	0.452
3	4 (57.1)	7 (36.8)	2 (66.7)	
Comorbidities				
HTN	4 (57.1)	16 (84.2)	2 (66.7)	0.322
DM	4 (57.1)	4 (21.1)	1 (33.3)	0.218
Others	5 (71.4)	7 (36.8)	1 (33.3)	0.278
Location of fracture				
Left	5 (71.4)	13 (68.4)	1 (33.3)	0.611
Right	2 (28.6)	6 (31.6)	2 (66.7)	

Table 2. Perioperative Characteristics of Patients who Underwent Hip Surgery

Variable	GA+PNB (n=7)	SAB+PNB (n=19)	No PNB (n=3)	*p*-value
Timing of block				
Postoperative	3 (42.9)	6 (31.6)	n/a	1.000
Preoperative	4 (57.1)	13 (68.4)		
Continuous perineural catheter inserted	2 (28.6)	5 (26.3)	n/a	1.000
Urgency				
Elective	5 (71.4)	9 (47.4)	2 (66.7)	0.623
Emergency	2 (28.6)	10 (52.6)	1 (33.3)	
Surgery time in minutes	200 (90-352)	124 (90-245)	153 (90-245)	0.479
Blood loss in mL	600 (300-1200)	450 (170-900)	400 (400-1200)	0.376

Table 3. Postoperative Outcomes of Patients who Underwent Hip Surgery

Variable	GA+PNB (n=7)	SAB+PNB (n=19)	No PNB (n=3)	*p*-value
NRS 30 min post block	0 (0-7)	0 (0-4)	n/a	0.977
NRS at rest				
POD1	0 (0-0)	0 (0-1)	3 (1-4)	0.023*
POD2	0 (0-0)	0 (0-1)	0 (0-1)	0.713
NRS at motion				
POD1	0 (0-3)	1 (0-6)	6 (6-9)	0.008*
POD2	0 (0-2)	1 (0-6)	4 (3-4)	0.009*
Satisfaction scores	5 (5-5)	5 (4-5)	4 (4-5)	0.210
Delirium score at POD2	0 (0-1)	0 (0-5)	0 (0-1)	0.993
Length of hospitalization in days	16 (10-24)	13 (7-36)	13 (7-15)	0.173
Need for postop opioid (MME)	0 (0-120)	0 (0-45)	45 (25-240)	0.047
Mortality	0 (0.0)	0 (0.0)	0 (0.0)	n/a

** Pairwise comparison showed significantly higher pain scores for No PNB than GA+PNB and SAB+PNB (p<0.001) while both blocks have equal outcomes (p>0.05).*

(GA+PNB = 0, SAB+PNB = 0). The median NRS at rest during POD1 was significantly highest (p=0.023) in No PNB group (3) than in both GA+PNB (0) and SAB+PNB (0). In contrast, the median NRS at rest during POD2 was similar (p=0.713) in the three groups (GA+PNB = 0, SAB+PNB = 0, No PNB = 0). The median NRS at motion during POD1 was significantly highest (p=0.008) in No PNB group (6) than in both GA+PNB (0) and SAB+PNB (1). Also, the median NRS at motion during POD2 was significantly highest (p=0.009) in No PNB group (4) than in both GA+PNB (0) and SAB+PNB (1). The median satisfaction score was similar (p=0.210) in the three groups (GA+PNB = 5, SAB+PNB = 5, No PNB = 4). The median delirium score at POD2 was similar (p=0.993) in the three groups (GA+PNB = 0, SAB+PNB = 0, No PNB = 0). The median length of hospitalization was also similar (p=0.173) in the three groups (GA+PNB = 16 days, SAB+PNB = 13 days, No PNB = 13 days). The median Morphine Milligram Equivalent (MME) of postoperative opioid was significantly higher in the No PNB group (45) among the three groups (p=0.047). No mortalities were reported in all groups.

As seen in Table 4, the PENG block and suprainguinal fascia iliaca compartment group block had no significant differences in terms of the NRS 30 min post-block (p=0.994), NRS at rest (POD1 p=0.252 and POD2 p=0.782), and NRS at motion (POD1 p=0.068 and POD2 p=0.072). No significant difference was found in median satisfaction scores (p=0.234), as was the case with delirium scores at POD2 (p=0.998).

Length of hospitalization in days ranged from 16 to 24 in the PENG block group, while this ranged from 10 to 20 in the suprainguinal fascia iliaca compartment block group. No significant difference was found between the two groups (p=0.123). Likewise, no significant difference was seen where the need for postoperative opioids was concerned (p=0.744).

Table 5 shows the postoperative outcomes of patients who underwent hip surgery and had the subarachnoid and peripheral nerve blocks. Three groups were compared, namely: those who had a PENG block (n=2), PENG block + lateral femoral cutaneous nerve block (n=5), and suprainguinal fascia iliaca compartment block (n=12).

Among these three groups, no significant differences were found in terms of NRS 30 min post-block (p=0.982), NRS at rest POD1 (p=0.243), NRS at rest POD2 (p=0.746), NTS at motion POD1 (p=0.058), and NRS at motion POD2 (p=0.069).

Table 4. Postoperative Outcomes of Patients who Underwent Hip Surgery and had GA+PNB

Variable	PENG Block (n=3)	Suprainguinal Fascia Iliaca Compartment Block (n=4)	*p*-value
NRS 30 min post block	0 (0-0)	0 (0-7)	0.994
NRS at rest			
POD1	0 (0-0)	0 (0-0)	0.252
POD2	0 (0-0)	0 (0-0)	0.782
NRS at motion			
POD1	1 (0-3)	1 (0-1)	0.068
POD2	1 (0-2)	1 (0-1)	0.072
Satisfaction scores	5 (5-5)	5 (5-5)	0.234
Delirium score at POD2	0 (0-1)	0 (0-1)	0.998
Length of hospitalization in days	17 (16-24)	16 (10-20)	0.123
Need for postop opioid (MME)	0 (0-30)	0 (0-120)	0.744
Mortality	0 (0.0)	0 (0.0)	n/a

Table 5. Postoperative Outcomes of Patients who Underwent Hip Surgery and had SAB+PNB

Variable	PENG Block (n=2)	PENG Block + Lateral Femoral Cutaneous Nerve Block (n=5)	Suprainguinal Fascia Iliaca Compartment Block (n=12)	*p*-value
NRS 30 min post block	2 (0-4)	0 (0-3)	0 (0-3)	0.982
NRS at rest				
POD1	0 (0-0)	0 (0-0)	0 (0-0)	0.243
POD2	0 (0-0)	0 (0-0)	0 (0-0)	0.746
NRS at motion				
POD1	4 (3-5)	1 (1-3)	1 (1-6)	0.058
POD2	2.5 (3-3)	1 (1-4)	1 (1-4)	0.069
Satisfaction scores	4.5 (4-5)	5 (5-5)	5 (5-5)	0.225
Delirium score at POD2	0 (0-0)	0 (0-1)	1 (0-5)	0.994
Length of hospitalization in days	12.5 (10-15)	13 (11-17)	14 (7-36)	0.165
Need for postop opioid (MME)	0 (0-5)	0 (0-45)	0 (0-45)	0.782
Mortality	0 (0.0)	0 (0.0)	0 (0.0)	n/a

Satisfaction scores were consistent across the PENG block + lateral femoral cutaneous nerve block and supra-inguinal fascia iliaca compartment block at 5, whereas for the two patients in the PENG block rated their satisfaction at 4 and 5. At any rate, there was no significant difference (p=0.225). Delirium scores (p=0.994), length of hospitalization (p=0.165), and need for postoperative opioid (p=0.782) were of no significant difference across the groups.

DISCUSSION

The number of hip fractures among the elderly population in the Philippines continues to rise, as does the cost. Peripheral nerve blocks in patients with fragility hip fractures were associated with significantly better outcomes compared to systemic analgesia. The current study demonstrated significantly higher NRS scoring during POD1 (both at rest and at motion) among those who did not receive any PNB as compared to those who received PNB. Likewise, the NRS scoring was also highest among those who did not receive any PNB compared to those who received during POD2 at motion. These results agree with the previous findings in the studies included in the patients who underwent fascia ilia block showed significant reduction in VAS scores preoperatively (10 minutes and 30 minutes after blockade) and postoperatively (immediate, 2 hours, 6 hours, and 12 hours postoperatively) compared to patients who received conventional analgesia.[4-7] Aside from the immediate relief of pain postoperatively, adequate pain control after hip surgery is also important to prevent complications of pain and immobility including longer hospital stays, poorer quality of life, delays in mobilization, delirium, functional loss, and even death.

Median Morphine Milligram Equivalent (MME) of postoperative opioid was significantly higher in the No PNB group among the three groups (p=0.047). This was consistent with existing studies that have shown that peripheral nerve blocks have consistently reduced the consumption of opioids (morphine, fentanyl, and tramadol) following hip fracture.[5-9] Doses of intravenous tramadol, intrathecal, and epidural morphine were converted to its corresponding MME using the following MME factors: tramadol at 0.1, epidural morphine at 30, and intrathecal morphine at 300. In general, the elderly population requires special considerations and necessary caution in administering opioids for hip fracture. In a particular study, as much as 545 (36%) out of 1511 elderly patients with hip fractures had renal dysfunction with glomerular filtration rate of less than 60 ml per minute, making them particularly at high risk for accumulation of morphine with subsequent sedation, respiratory depression, and hypoxia.[14]

The delirium scores were low (0) for all the three treatment groups in the current study and there was no significant difference seen. These results are consistent with the Cochrane review which also showed no significant difference among the elderly patient who underwent peripheral nerve blocks in terms of risk of acute confusional state. According to Mouzopoulos, there could be multiple factors contributing to the pathophysiology of acute confusional state in these individuals, such as hypoxemia, infection, immobility, side effects of drugs, and systemic inflammation.[14] Local anesthetics or peripheral nerve blocks may impact any of these variables.

Hospital length of stay was similar in all three groups as seen in the current study. However, the recorded days of stay are generally longer than those seen in a previous study in other countries. In a study from the United Kingdom, patients with hip fractures who received peripheral nerve blocks had a mean hospital stay of 10 days compared to 15 days among those who did not receive peripheral nerve blocks.[11] This may be attributable to different variables, such as severity of the condition, socioeconomic profile of patients, protocols followed by the hospital, and other related factors.

No morbidities and mortalities were reported in this study. An earlier study concluded that there was no evidence showing that nerve blocks increase the likelihood that a hip fracture patient may experience adverse effects, as well as it causes any patient safety problems.[15] Likewise, a study by Lees et al. reported significantly lower mortality among patients with hip fractures who received femoral nerve block than those who did not.[11] Based on the Cochrane review, peripheral nerve blocks were shown to reduce the risk of pneumonia.[4] On the other hand, Monzon et al. reported fewer episodes of nausea and vomiting on patients who received femoral nerve block.[12] Several studies also suggested that there would be a low likelihood of nerve damage lasting longer than six months from femoral nerve blocks.[16-18]

In the current study, results revealed that there was no significant difference seen in the satisfaction scores among the three groups. This is inconsistent with the study by Diakomi et al., which reported that patients with hip fractures who received peripheral nerve blocks were more satisfied than patients treated with intravenous fentanyl prior to positioning for spinal anesthesia.[10] Similarly, the results of the study of Guay et al. also showed that participant's satisfaction was higher when peripheral nerve block was used.[4] The varying results may be influenced by different factors, such as where the study was conducted and the sociocultural backgrounds of the participants.

As for limitations, the study's patient selection was not randomized, which may cause a bias risk in the results. Moreso, since this study included a limited number of participants and was conducted in a single institution, it may not accurately represent all elderly hip fracture patients in the country. It is recommended that more studies with higher numbers of participants from multi-centered hospitals and areas be conducted in the future to allow for more generalized results. Specifically, the number of non-PNB participants may be increased to obtain better comparisons. Likewise, other adverse events should be measured to give a more meaningful

analysis of the results. Even with these limitations, this study can still improve the understanding of the use of peripheral nerve blocks in elderly patients with hip fractures. Another limitation of the study is that follow-up was limited to hospital admission, a condition that necessarily precludes mortality outcomes. Other variables such as post-operative nausea and vomiting were not analyzed; future studies may include these other variables for a fuller view.

CONCLUSION

Peripheral nerve block appears to be effective in elderly patients undergoing surgery for fragility hip fractures where the limited study size of 29 is concerned. It results in lower pain scores and can be administered with equal effectiveness either with general anesthesia or with subarachnoid block. Mortality rate, incidence of delirium, and hospital length of stay did not vary between those with and without peripheral nerve block**.**

Statement of Authorship

Both authors certified fulfillment of ICMJE authorship criteria.

Author Disclosure

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