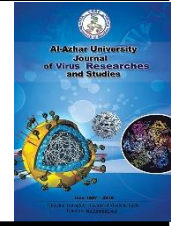




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Comparative Study between Hyperbaric Bupivacaine 0.5% and Hyperbaric Prilocaine 2% in spinal anesthesia for Saddle Area Surgeries

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Abstract

Ambulatory anesthesia allows quick recovery from anesthesia, leading to an early discharge and rapid resumption of daily activities, which can be of great benefit to patients, healthcare providers, third-party payers, and hospitals. To compare hyperbaric prilocaine 2% (takipril) with hyperbaric bupivacaine 0.5% for day-case spinal anesthesia in the term of primary outcome which is the time to sensory and motor block regression and secondary outcome in the form of time to home readiness, early ambulation, incidence of complications in saddle area surgeries. This study was carried out in Al-Azhar University hospitals (Al-Zahraa hospital) and included 46 patient aged 18 to 65 years of both sexes undergoing saddle perianal operations under spinal anesthesia. Patients were randomly allocated into two equal groups 23 patients in each group. In our study was that day-case spinal anesthesia with prilocaine 40 mg +20 µg fentanyl provide faster sensory block onset, regression in Group P than in Group B (136.91 ± 12.81 min versus 201.30 ± 19.69 min) as primary outcome and home readiness for Group P than for Group B (186.43 ± 30.75 min versus 231.39 ± 25.61 min) with less complication as secondary outcome compared with 10 mg bupivacaine + 20 µg fentanyl for day case spinal anesthesia. Hyperbaric prilocaine + fentanyl is superior to hyperbaric bupivacaine + fentanyl in the term of primary outcome which is earlier sensory and motor block regression and secondary outcome in the form of home readiness, early ambulation and complication, so we recommended hyperbaric prilocaine for day- case surgery in saddle area surgeries.

Keywords: Motor block resolution; Sensory block resolution; Hyperbaric Bupivacaine; Hyperbaric Prilocaine.

1. Introduction

Ambulatory anesthesia allows quick recovery from anesthesia, leading to an early discharge and rapid resumption of daily activities, which can be of great benefit to patients, healthcare providers,

third-party payers, and hospitals. For successful and safe ambulatory anesthesia, the anesthesiologist must consider various factors relating to the patient. Among them, appropriate selection of patients, surgical

and anesthetic methods, as well as postoperative management. The use of regional anesthesia in ambulatory surgeries provides a safe, reliable anesthetic and recovery plan. Spinal anesthesia is a safe anesthetic modality for surgical procedures on the lower part of the body with fast onset and minimal side effects [1].

The incidence of perianal surgery varies among institutions, accounting for up to 10% of general surgical procedures. The procedure is suitable to perform on a day-case basis with spinal anesthesia. However, prolonged sensory and motor block and urinary retention can cause a delay in discharge. Day-case spinal anesthesia with short-acting local anesthetics such as lidocaine and chloroprocaine can provide short times to discharge. However, the association of lidocaine with transient neurologic symptoms (TNS) and chloroprocaine with neurologic injury has limited the use of these agents in spinal anesthesia. Bupivacaine is safe with a very low incidence of associated TNS, but the prolonged sensory and motor block are a disadvantage for day-case spinal anesthesia [2]. The recently introduced local anesthetic agent, hyperbaric prilocaine 2%, has a short duration of action and the TNS incidence is low. Hyperbaric prilocaine provides faster spinal block onset and earlier patient recovery in ambulatory surgery [3].

Prilocaine is an amide local anesthetic that has been used for over five decades for spinal anesthesia. The main side effect that we should consider is that prilocaine is primarily metabolized in the liver by amide hydrolysis to *s*-toluidine and *N*-propylalanine; *s*-toluidine is subsequently hydroxylated to 2-amino-3-hydroxytoluene and 2-amino-5-hydroxytoluene, metabolites responsible for the occurrence of methaemoglobinemia but a high dose of prilocaine (more than 6 mg/kg) is needed to cause a clinically apparent methaemoglobinemia in the healthy adult [4].

2. Patients and Methods

This study was a simple randomized prospective done and it performed according to:

- **Type of study:** Double blind randomized control clinical trial.
- **Study setting:** Al-Azhar University Hospitals (Al-Zahraa hospital), Cairo, Egypt.
- **Study period:** from March 2021 to September 2021.

2.1 Inclusion criteria:

Patients with (American Society of Anesthesiologists-ASA- 1 and 2), aged (18) to (65) years and of either sex who scheduled for elective saddle area surgeries (perianal abscess evacuation, anal fissurectomy, perianal fistulectomy, Hemorrhoidectomy and rectal prolapse repair).

2.2 Exclusion criteria:

1. Patients with (ASA) physical status above 2.
2. Patient with mental incapacity precluding informed consent.
3. Presence of coagulopathy.
4. Presence of sever pulmonary pathology.
5. Anemia and Methaemoglobinemia.
6. Patient with sever mitral or aortic stenosis.
7. Patients with preexisting neuropathology in the lower limbs.
8. Allergy to studied drugs.
9. Infection at the site of the injection.

2.3 Sample size:

Using g. power 3.19.2 software, setting 5% significant, confidence interval 95% and power at 80% results from previous study Kaban et al. [5]. In the study, recovery time

(time to sacral 3 (s3) resolution of sensory block) (min) in group P was 133.8 ± 41.4 and in group B was $200, 4 \pm 64.8$ and a large effect size ($f=0.442$). Based on this, 23 cases per group (46 totals) were needed, including the possible drop out.

2.4 Ethical considerations:

The study was performed after approval of the Research Ethics Committee of the Faculty of medicine, Al-Azhar University for Girls and after obtaining informed consent from the patients to participate in the study. The study protocol was explained to the patient before taking their consent to the type of anesthesia and surgical procedure.

2.5 Pre-operative preparation:

Routine preoperative assessment was done to all patients including history, clinical examination, laboratory investigations (complete blood picture. Kidney function tests. Liver function tests, prothrombin time, partial thromboplastin time, international normalized ratio (INR). Serum glucose level and serum electrolytes) and chest X-ray and electrocardiogram (ECG) if needed. Patients were instructed to use the visual analogue scale (VAS) for Pain assessment postoperatively. Which provide simple, efficient and minimally intrusive measures of pain intensity, the most common VAS consists of a 10-cm line with one end labeled "no pain" and the other end labeled "worst pain imaginable." The patient marks the line at the point that best describes the pain intensity.

2.6 Patient Monitoring:

Monitoring equipments were attached to the patient including non-invasive arterial blood pressure (NIABP), peripheral oxygen saturation (SPO₂) and 3 leads electrocardiogram (ECG) leads were connected on arrival to the operating room

and base line vital parameters were recorded.

2.7 Anesthetic Technique:

Patients were given spinal anesthesia. In the operation room, vascular access was secured with 18-G cannula and appropriate IV fluids (preload) were started in the form of Ringer's lactate at 10 ml/kg over 15-20 min. Then patients were premedicated with 0.03 mg/ kg midazolam IV,. Patients were randomized into two groups. We used computer derived sequence of numbers for randomization and sealed envelope method for group distribution.

- Hyperbaric prilocaine spinal anesthesia group P n = (23).
- Hyperbaric bupivacaine spinal anesthesia group B n= (23).

The bupivacaine group (Group B) ($n = 23$) received 2 mL (10 mg) 0.5% hyperbaric bupivacaine and 0.4 mL fentanyl (20 μ g). The prilocaine group (Group P) ($n = 23$) received 2 mL (40 mg) 0.5% hyperbaric prilocaine and 0.4 mL fentanyl (20 μ g).

After that, the patient was prepared to receive spinal anesthesia. An assistant helped to maintain the patient in a comfortable curled position. Sterilization was done by scrubbing with an antiseptic solution and gloves up carefully and then cleaning the patient's back with the swabs and antiseptic solution. Spinal anesthesia was performed at the lumbar vertebra 4/5 (L4-5) intervertebral space with the patient in the sitting position with a midline approach and a 25 G needle. After verifying free flow of clear cerebrospinal fluid, the prepared solution was injected into the intrathecal space in 15 seconds. The patients remained in this position for 2 minutes after the injection and positioning according to the operation was done. Oxygen (4L/min) was administered throughout the procedure via nasal cannula. Intraoperative fluid management was done

according to body weight of the patient, vital signs and intraoperative losses.

During the surgery, additional analgesia in the form of fentanyl intravenous will be administered according to the patient's need and the total injected dose will be recorded.

2.8 Anesthetic Technique:

(A) Intraoperative parameters:

Hemodynamic changes: Heart Rate (HR), Mean Arterial blood pressure (MAP), and peripheral oxygen saturation (SPO₂) were monitored every 5 minutes.

Onset of sensory analgesia (min): was defined as the time taken from the end of the injection to the first dull response to pinprick in the distribution of any of the sensory nerves in the lower limb, also level of maximum sensory block was measured.

Onset of motor block (min): was defined as the time taken from the end of the injection to the motor block according to modified Bromage scale. The motor block was measured when the maximum dermatomal spread was achieved using the modified Bromage scale, after 1 hr and after 2 hrs.

(B) Postoperative parameters:

Resolution of the spinal block was assessed by:

- The time to two segment L1 and S3 regression of the sensory block.
- The regression of motor block was also determined.
- Pain was measured with a visual analogue scale (VAS) (0: no pain; 10: maximum pain) and when the patient complained of pain.

The first analgesic intake (min) was determined.

The time to home discharge was assessed as the time from the end of surgery until the patients reached a postanesthesia discharge score (PADS) ≥ 9 and time to void

spontaneously, also time to stand unassisted. Postoperative complications as nausea, vomiting and urinary retention were also noted.

2.9 Statistical analysis:

Recorded data were analyzed using the statistical package for social sciences, version 20.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative data were expressed as mean \pm standard deviation (SD). Qualitative data were expressed as frequency and percentage.

The following tests were done:

- Independent-samples t-test of significance was used when comparing between two means.
- Mann Whitney U test: for two-group comparisons in non-parametric data.
- Chi-square (χ^2) test of significance was used in order to compare proportions between qualitative parameters.
- The confidence interval was set to 95% and the margin of error accepted was set to 5%. So, the p-value was considered significant as the following:

Probability (P-value): P-value < 0.05 was considered significant, P-value < 0.001 was considered as highly significant, P-value > 0.05 was considered insignificant

3. Results

There were no statistically significant differences between groups according to demographic data regarding Age (years), Sex, BMI [wt/(ht)²], ASA, physical status and Duration of surgery (min), with p-value ($p > 0.05$) as shown in Table 1. Additionally, there was no statistically significant difference between groups according to type of operation as shown in Figure .1.

Table (1): Comparison between groups according to demographic data.

Demographic data		Bupivacaine Group	Prilocaine Group	Test value	p-value
		No. = 23	No. = 23		
Age (years)	Range	20 – 49	19 – 65	t = -0.140	0.889
	Mean ± SD	33.04 ± 8.50	33.48 ± 12.21		
Sex	Male	13 (56.5%)	11 (47.8%)	x ² = 0.348	0.555
	Female	10 (43.5%)	12 (52.2%)		
BMI [wt/(ht)^2]	Range	19 – 26	19 – 28	t=-0.069	0.946
	Mean ± SD	22.70 ± 1.79	22.74 ± 2.45		
ASA	I	19 (82.6%)	20 (87.0%)	x ² =0.168	0.681
	II	4 (17.4%)	3 (13.0%)		
Duration of surgery (min)	Range	18 – 40	20 – 40	t = 1.893	0.065
	Mean ± SD	28.22 ± 6.28	32.13 ± 7.66		

Using: *t*-Independent Sample *t*-test; *x*²: Chi-square test

p-value>0.05 NS

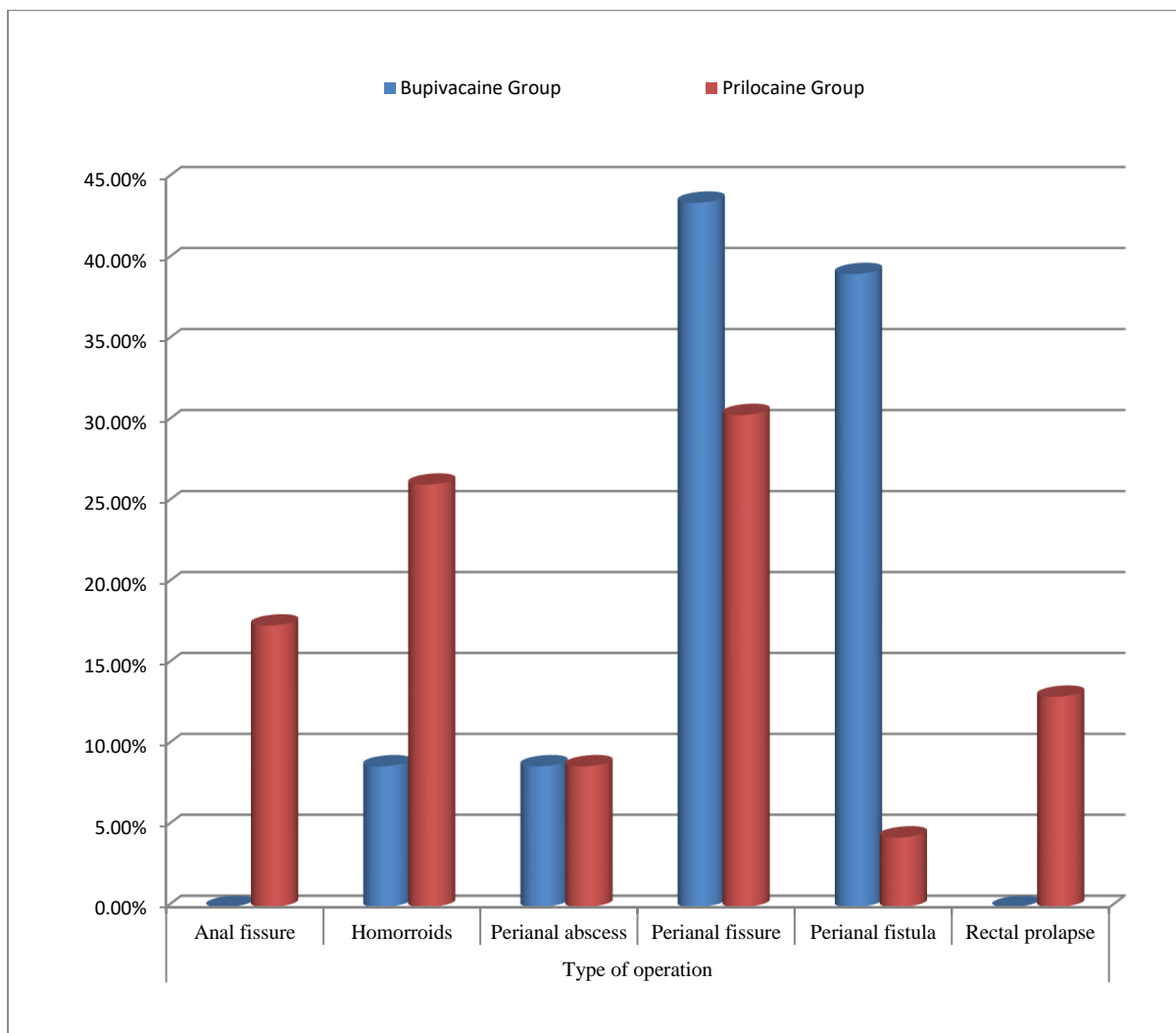


Figure (1): Comparison between groups according to type of operation.

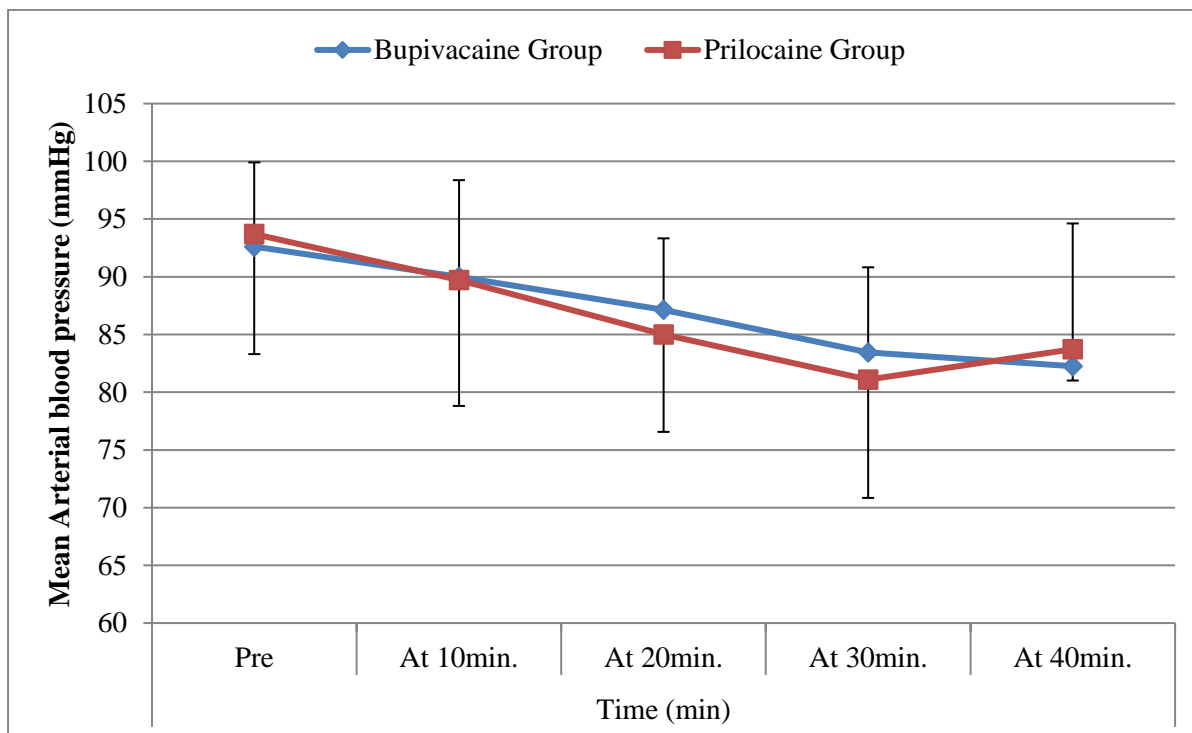


Figure (2): Comparison between groups according to MBP (mmHg).

Table (2): Comparison between groups according to sensory block (min).

Sensory block (min).		Bupivacaine Group	Prilocaine Group	t-test value	p-value
		No. = 23	No. = 23		
Onset (min)	Range	5 – 7.5	4 – 5	8.279	<0.001**
	Mean ± SD	5.85 ± 0.76	4.30 ± 0.47		
Maximum sensory block					
Time to Maximum sensory block (min)	Range	14 – 18	12 – 14	8.084	<0.001**
	Mean ± SD	15.91 ± 1.31	13.30 ± 0.82		
Level of maximum sensory block(vertebra)	Median (IQR)	10 (9-11)	8 (7-9)	U = 4.551	<0.001**
	Range	8 - 11	6 - 10		
Regression of sensory block to S3 (min)	Range	181 – 245	120 – 162	13.147	<0.001**
	Mean ± SD	201.30 ± 19.694	136.91 ± 12.813		
Regression of sensory block to L1 (min)	Range	51 – 70	40 – 58	10.867	<0.001**
	Mean ± SD	60.70 ± 4.39	46.35 ± 4.56		

Using: t-Independent Sample t-test; **p-value <0.001 HS

There were statistically significant higher values in Bupivacaine group compared to Prilocaine group according to their sensory block regarding Onset (min), Maximum sensory block (min), Level of maximum sensory block(vertebra), Regression of

sensory block to S3 (min) and Regression of sensory block to L1 (min), with p-value (p<0.001). This table shows statistically significant higher values of Bromage score in Bupivacaine group compared to Prilocaine group at 1hr. and at 2hrs with p-

value>0.05 NS; p-value <0.05 S; p-value <0.001 Hs. There were statistically significant higher values in Bupivacaine group compared to Prilocaine group according to time to stand unassisted (min), time to void (urinate) and time to home readiness (PADS), with p-value <0.05 S; p-value <0.001 HS. There was a

statistically significant faster time to request analgesia in Prilocaine group compared to Bupivacaine group, with p-value <0.001. None of the patients in all groups had experienced any side effect or complication either of the anesthetic technique or of the used drugs.

Table (3): Comparison between groups according to demographic data.

Motor block (Bromage score)	Bupivacaine Group (n=23)	Prilocaine Group (n=23)	x ² -test value	p-value
At maximum sensory block				
1	2 (8.7%)	7 (30.4%)	3.454	0.178
2	17 (73.9%)	13 (56.5%)		
3	4 (17.4%)	3 (13.0%)		
At 1hr.				
0	2 (8.7%)	20 (87.0%)	28.527	<0.001**
1	17 (73.9%)	3 (13.0%)		
2	4 (17.4%)	0 (0.0%)		
At 2hrs.				
0	19 (82.6%)	23 (100.0%)	4.381	0.036*
1	4 (17.4%)	0 (0.0%)		

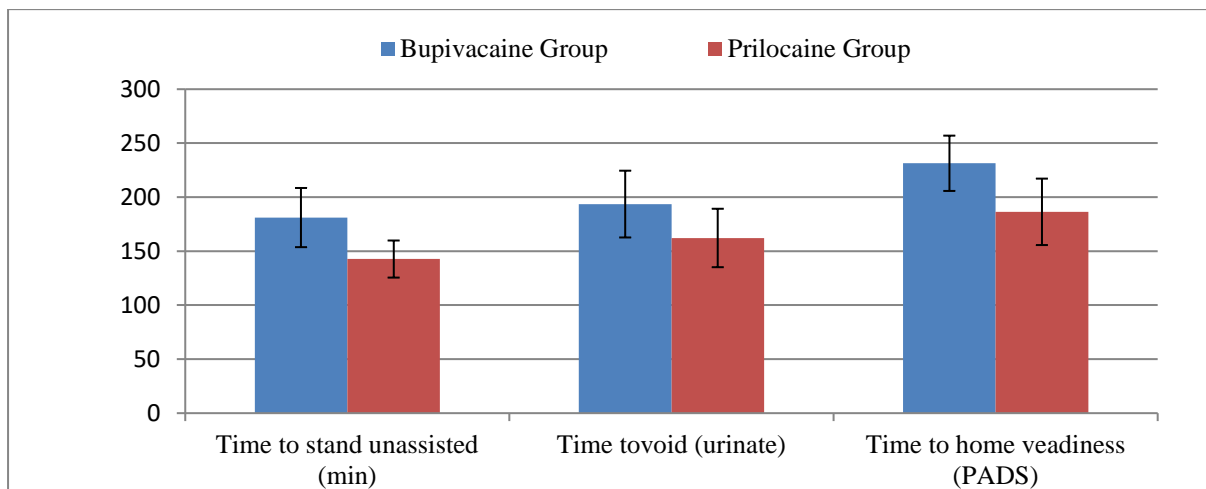


Figure (3): Comparison between groups according to Time to stand unassisted (min), Time to void (urinate) and Time to home readiness (PADS).

Table (4): Comparison between groups according to 1st time analgesia request “min.”.

1st time analgesia request (min)	Bupivacaine Group (n=23)	Prilocaine Group (n=23)	t-test value	p-value
Mean ± SD	248.57±9.68	190.78±13.23	16.908	<0.001**
Range	231–263	143–210		

Table (5): Comparison between groups according to complications.

Complication	Bupivacaine Group (n=23)	Prilocaine Group (n=23)	χ^2 -test value	p-value
No	23 (100.0%)	23 (100.0%)	0.000	1.000

4. Discussion

This study was done to compare hyperbaric prilocaine 2% (takipril) with hyperbaric bupivacaine 0.5% for day-case spinal anesthesia in term of primary outcome which is duration of anesthetic recovery with the time to sensory and motor block resolution and secondary outcome in the form of time to home readiness, early ambulation, incidence of complications, and the efficacy of spinal block in saddle area surgeries especially perianal. The main finding in our study was that day-case spinal anesthesia with prilocaine 40 mg +20 μ g fentanyl provides faster sensory block onset, resolution as primary outcome and home readiness with less complication as secondary outcome compared with 10 mg bupivacaine + 20 μ g fentanyl for day case spinal anesthesia. In our study, the time to L1 regression and S3 regression of the sensorial block was significantly shorter in Prilocaine group than in Bupivacaine Group (46.3 ± 4.56 min versus 60.70 ± 4.39 min, and 136.91 ± 12.81 min versus 201.30 ± 19.69 min). Also, the mean time to home readiness was shorter for Group P than for Group B (186.43 ± 30.75 min versus 231.39 ± 25.61 min). The efficacy of prilocaine in sensory block onset, resolution and home readiness was demonstrated in several studies, Kaban and his *colleagues* [5] conducted a double-blind clinical trial study on 50 patients ASA 1 and 2 aged 20-50 of both sexes all of whom had undergone elective perianal surgeries under spinal anesthesia. Patients were randomly divided into 2 groups (25 patients in each group). The first group (B) received 1.5 ml (7.5 mg) 0.5% hyperbaric

bupivacaine and 0.4 ml fentanyl (20 μ g) in a total 1.9 ml intrathecally. The second group (P) received 1.5 ml (30 mg) 0.5% hyperbaric prilocaine and 0.4 ml fentanyl (20 μ g) in the same volume. The study of *Kaban et al.* [5] showed that day-case spinal anesthesia with prilocaine 30 mg + 20 μ g fentanyl provides faster sensory block, resolution of the block and home readiness compared to 7.5 mg bupivacaine +20 μ g fentanyl and the surgical conditions are comparable for perianal surgery. In the present study, time to L1 regression and S3 regression of the sensorial block was significantly shorter in Prilocaine group than in Bupivacaine Group (46.3 ± 4.56 min versus 60.70 ± 4.39 min, and 136.91 ± 12.81 min versus 201.30 ± 19.69 min) in comparison to *Kaban et al.* [5] which was (45.7 ± 21.9 min versus 59.7 ± 20.9 min, and 133.8 ± 41.4 min versus 200.4 ± 64.8 min). Also, the mean time to home readiness was shorter for Group P than for Group B (186.43 ± 30.75 min versus 231.39 ± 25.61 min) in compared to *Kaban et al.* [5] which is (155 ± 100.2 min versus 207.2 ± 62.7 min). The study of *Kaban et al.* [5] differs from the present study in the volume of drugs injected intrathecally and the concentration of prilocaine. They used 7.5mg 0.5% hyperbaric bupivacaine and 30 mg 0.5% hyperbaric prilocaine + 20 μ g fentanyl in both groups while in the present study we used 10 mg 0.5% hyperbaric bupivacaine and 40 mg 2% hyperbaric prilocaine + 20 μ g fentanyl in both groups. It also differs in the operation duration. their duration average was 18-20 mins while ours was 28-32 mins. *Kaban* study agreed with the present study that day-case spinal anesthesia with hyperbaric

prilocaine + fentanyl is superior to hyperbaric bupivacaine in terms of earlier sensory block resolution and home readiness and the surgical conditions are comparable for perianal surgery. *Black and his colleagues* [6] conducted a double-blind clinical trial study on 50 patients ASA 1,2 and 3 aged from 23 -80 of both sexes all of whom undergone ambulatory elective knee orthoscopic surgeries under spinal ansthesia. Patients were randomly divided into 2 groups (25 patients in each group). The first group (p) received 2 ml (20 mg) prilocaine and 0.4 ml fentanyl (20 µg) in a total 2.4 ml intrathecally. The second group (B) received 2 ml (7.5 mg) plain bupivacaine and 0.4 ml fentanyl (20 µg) in the same volume (prepared by the pharmacy at Flinders Medical Centre, Australia). At 2 h, motor block in Group P had fully resolved in 86% of patients, compared with 27% in Group B. Median time to first void was significantly shorter in group p (205 min) than in group B (275 min). A clinically significant decrease in arterial pressure was more common in Group B (73%) than in Group P (32%). The study of *Black et al.* [6] demonstrates the superiority of the combination of prilocaine (20 mg) and fentanyl (20 µg) over that of plain bupivacaine (7.5 mg) and fentanyl (20µg) for spinal anesthesia in ambulatory arthroscopic knee surgery. It is superior because of faster attainment and resolution of block, together with greater hemodynamic stability. Potential advantages include earlier ambulation, reduced risk of urinary retention, and earlier patient discharge. In addition, because of the low reported incidence in other studies of transient neurologic symptoms associated with its use. The study of *Black et al.* [6] differs from the present study in the formula, volume and concentration of drugs injected intrathecally. They used 2 ml (20 mg) prilocaine and 2 ml (7.5 mg) plain bupivacaine +0.4 ml fentanyl (20 µg) in both groups prepared by the pharmacy at Flinders medical center, Australia. while

we used 10 mg 0.5% hyperbaric bupivacaine and 40 mg 2% hyperbaric prilocaine + 0.4 ml fentanyl in both groups. It also differs from us in the type of operations. Their operations were knee orthoscopic surgery while ours were saddle area perianal surgery. They considered patient's age up to 80 yrs old and ASA 3 while we considered patient age up to 65 and exclude ASA 3. They also considered post operative patient satisfaction score. We both agreed that day case spinal anaesthesia with prilocaine + fentanyl is superior to bupivacaine in the term of faster attainment and resolution of block, earlier ambulation and earlier patient discharge. *Chapron and his colleagues* [7] conducted a double-blind clinical trial study on 50 patients ASA 1and 2 aged from 18 - 40 years all of whom undergone elective caesarean section under spinal anesthesia. Patient were randomly divided into 2 groups (25 patients in each group). The first group (p) received 60 mg intrathecal hyperbaric prilocaine. The second group (B) received 12.5 mg intathecal hyperbaric bupivacaine. Both 2.5 µg sufentanil and 100 µg morphine were added to the local anaesthetic agent in both groups. Median motor and sensory block duration was significantly shorter in the prilocaine group, 158 (125–188 [95–249]) vs. 220 (189–250 [89–302]) min. Median length of stay in the post-anesthetic care unit was significantly shorter in the prilocaine group, 135 (120–180 [120–230]) vs. 180 (150–195 [120–240]) min. There was no difference between groups for: maternal intra-operative hypotension; APGAR score; umbilical cord blood pH; maternal postoperative pain; and patients' or obstetricians' satisfaction. The study of *Chapron et al.* [7] showed that day-case spinal anaesthesia with hyperbaric prilocaine induced a shorter and more reliable motor block compared with hyperbaric bupivacaine for non-breastfeeding women with uncomplicated pregnancies and undergoing elective cesarean section. This was associated with

a high level of safety and satisfaction for both patients and practitioners. Prilocaine allows shorter stays and monitoring in PACU as compared with bupivacaine, reducing overall staff work- load. The study of *Chapron et al.* [7] differs from the present study in the volume of drugs injected intrathecally. They used 60 mg prilocaine and 12.5 mg bupivacaine +2.5µg sufentanil and 100µg morphine in both groups while we used 10 mg 0.5% hyperbaric bupivacaine and 40 mg 2% hyperbaric prilocaine + 20 µg fentanyl in both groups. It also differs from ours in the type of operations. Their operations were elective caesarean section while ours were saddle area perianal surgery. They also considered maternal intra-operative hypotension; APGAR score; umbilical cord blood pH; maternal postoperative pain; and patients' or obstetricians' satisfaction because of the nature of their operation. We both agreed that day-case spinal anaesthesia with hyperbaric prilocaine is superior to bupivacaine in the term of a shorter, more reliable and resolution of block, earlier ambulation and earlier patient discharge. Hyperbaric solutions of prilocaine for intrathecal use may provide some advantage over isobaric formulations. *Camponovo et al.* [8] showed that the hyperbaric formula groups (40 mg and 60 mg) had shorter onset of motor and sensory block, offset of motor block and faster time to urinary voiding than the plain formulation. Additionally, patients in the group receiving 40 mg hyperbaric prilocaine were significantly more likely to require supplemental anesthesia. Thus, 60 mg of hyperbaric prilocaine appears to have the best profile for patient satisfaction and anesthesia requirements for ambulatory procedures. *Gebhardt et al.* [9] found the optimal dosage for low- dose spinal anesthesia using hyperbaric prilocaine for patients undergoing perianal surgery. Using doses of 10, 20 and 30 mg in 116 patients, they concluded that while all three dosages can provide sufficient anesthesia for the procedure, 10 mg was

recommended for perianal surgery due to the absence of motor block and a shorter recovery time. *Guntz et al.* [10] investigated the doses of 2% hyperbaric prilocaine for patients undergoing ambulatory knee arthroscopy. Using an up-and-down sequential allocation technique analyzed by isotonic logistic regression, followed by a subsequent observational study to confirm the initial findings to describe the initial block characteristics and side effects, ED50 was estimated to be 28.9 mg and ED90 38.5 mg. A total of 40 mg provided adequate anesthesia in 92% of patients while no adverse hemodynamic and neurological side effects or urinary retention were observed and so 40 mg dosage is considered in our study. In the present study no complications or side effects to the drugs were detected among patients

5. Conclusion

Hyperbaric prilocaine + fentanyl is superior to hyperbaric bupivacaine + fentanyl in the term of primary outcome which is earlier sensory block onset, sensory and motor block regression and secondary outcome in the form of home readiness, early ambulation and discharge with less side effects and complications, so we recommended hyperbaric prilocaine for day- case surgery in saddle area surgeries.

References

1. Lee JH (2017): Anesthesia for ambulatory surgery. *Korean J Anesthesiol.* 70(4):398-406
2. Herndon CL, Martinez R, Sarpong NO, et al. (2020): Spinal Anesthesia Using Chlorprocaine is Safe, Effective, and Facilitates Earlier Discharge in Selected Fast-track Total Hip. *Arthroplasty;* 6(3): 305 - 308.
3. Rattenberry W, Hertling A and Erskine R (2019): Spinal anaesthesia for

- ambulatory surgery. *BJA Education*; 19(10):321-328.
4. Yu S, Wang B, Zhang J, Fang K (2019): The development of local anesthetics and their applications beyond anesthesia. *Int J Clin Exp Med*; 12(12):203-220.
 5. Kaban OG, Yazicioglu D, Akkaya T, et al. (2014): Spinal anaesthesia with hyperbaric prilocaine in day-case perianal surgery: randomised controlled trial. *Sci World J*; Article ID 608372, 6 pages.
 6. Black AS, Newcombe GN, Plummer JL, et al. (2011): Spinal anaesthesia for ambulatory arthroscopic surgery of the knee: a comparison of low-dose prilocaine and fentanyl with bupivacaine and fentanyl. *Br J Anaesth*; 106:183–8.
 7. Chapron K, Sleth JC, Capdevila X, et al. (2021): Hyperbaric prilocaine vs. hyperbaric bupivacaine for spinal anaesthesia in women undergoing elective caesarean section: a comparative randomised double-blind study. *Anaesthesia*; 76(6):777-84.
 8. Camponovo C, Fanelli A, Ghisi D, et al. (2010): A prospective, double-blinded, randomized, clinical trial comparing the efficacy of 40 mg and 60 mg hyperbaric 2% prilocaine versus 60 mg plain 2% prilocaine for intrathecal anesthesia in ambulatory surgery. *Anesth Analg*; 111:568–72.
 9. Gebhardt V, Herold A, Weiss C, et al. (2013): Dosage finding for low-dose spinal anaesthesia using hyperbaric prilocaine in patients undergoing perianal outpatient surgery. *Acta Anaesthesiol Scand*; 57:249–56.
 10. Guntz E, Latrech B, Tsiberidis C, et al. (2014): ED50 and ED90 of intrathecal hyperbaric 2% prilocaine in ambulatory knee arthroscopy. *Can J Anaesth*; 61:801–7

