Comparison between Caudal Block and Saddle Block in Anorectal Surgery

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ABSTRACT:

BACKGROUND:

Anorectal surgery includes pilonidal sinus, hemorrhoidectomy, anal fissure, and anal fistula operations. Various surgical and anesthetic techniques have been used to increase the level of patients perioperative analgesia and decrease the length of stay in the hospital.

AIM OF STUDY:

To compare the effectiveness of saddle block and caudal block during anorectal surgery on patients' perioperative hemodynamic values, onset of sensory and motor block, mobility and frequency of analgesia given post op.

PATIENTS AND METHODS:

80 patients underwent anorectal surgery were randomly allocated into 2 equally groups, caudal block was applied to the 1st group 40pt. and saddle block was applied to the 2nd group 40 patients .Onset of Sensory and motor block was recorded. Heart rate, systolic arterial pressure, diastolic arterial pressure and oxygen saturation were measured every 3 minutes until the end of the operation. In postoperative period the frequency of rescue analgesic drugs given and duration of staying in hospital were recorded.

RESULTS:

In both groups, there were no changes in hemodynamic profile. No motor block was detected in group B but noted in group A. Onset of sensory nerve block in group B was more rapid than in group A and duration of post operative analgesia was shorter than that in group A. Early discharge from hospital was associated with group B in comparison with group A.

CONCLUSION:

Saddle block provides rapid-onset of sensory block, zero motor block, early ambulation and early hospital discharge in comparison to caudal block which was slower in onset with mild to moderate motor block and associated with increase time of staying in hospital.

KEYWORDS: Anorectal surgery, spinal (saddle) block, caudal block, bupivacaine.

INTRODUCTION:

So many patients are complaining from anorectal pathologies, and they are usual visitors of the outpatient clinics and casualties units. [(1)] The spectrum of anorectal disorders ranges from benign and irritating (pruritus ani) to potentially life-threatening (anorectal cancer).[(2)] Surgical intervention is the main line of treatment for most of the anorectal diseases. The surgical treatment is usually performed under general or regional anesthesia. Anorectal surgery need deep anesthesia because the zone acquire many of nerve supply and is reflexogenic.[(3)] Many of techniques regarding anesthesia is performing worldwide such as general, caudal and spinal anesthesia.[(4,5)]

PATIENTS AND METHODS:

Prospective randomized clinical trial carried out on 80 patients undergoing anorectal surgery collected in Baghdad teaching hospital of medical city (general surgery) in a period from 1st of April at 2019 to 1st of November at 2019. Study approval was obtained from the Iraqi scientific council of anesthesia and intensive care and informed consent was obtained from 80 pt. randomly allocated into two equally groups in the study.

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Patient aged 18-60 years old patients,ASA 1-2 were included. Patients with known hypersensitivity to amide type local anesthetics and patients with contraindications to central block (caudal, saddle block): use of anticoagulant medication, local infection in the intervention site, increased intracranial pressure, severe aortic and / or mitral valve stenosis and patient refusal were excluded.

In preoperative period full history was obtained from all patients. IV cannula was inserted. All resuscitation drugs and equipment were prepared. Patient electrocardiogram (ECG), peripheral oxygen saturation (SpO2), non-invasive blood pressure monitoring were performed in the operation room. Heart rate (HR), systolic arterial pressure (SAB),diastolic arterial pressure (DAB), mean arterial pressure (MAB) and will be measured every 3 minutes until the end of the operation.

The onset of sensory and motor block and duration of surgery were recorded. Then the prospective randomized study which was included 80 patients, were divided equally into two groups (group A and group B).Group A were undergone caudal block and group B were undergone spinal saddle block. In the caudal block group (group A),the patient put in prone position ,sterile skin preparation and draping on entire region was performed, skin infiltration done with local anesthesia, sacral horns are palpated and sacral hiatus will be determined. The 18 G Tuohy needle was advanced from skin to sacral hiatus through sacrococcygeal ligament, syringe loaded with air was attached to the needle and loss of resistance technique was applied to identify the epidural space..At the beginning 3 ml as a testing dose was injected and waited 3 min with observation of vital signs if no alteration then total volume is given. In the saddle block group (group B) the patient prepared and put in sitting position, sterilization of skin done with local infiltration of skin, hyperbaric bupivacaine at a dose of 7.5 mg (concentration 0.5%, total volume 1.5 ml) will be given to the intrathecal space after a 25 G quincke spinal needle is inserted between L4-L5 and clear cerebrospinal fluid was seen. Upper level of sensory block was assessed by pinprick. Modified Bromage scale was used to assess onset of motor blockade. The time of onset of motor block was defined as the time gap between intrathecal injection and loss of motor activity.

The onset time of sensory blockade was defined as the interval between intrathecal injection and loss of sensation. Hypotension was defined as a fall in systolic blood pressure below 100 mmHg. In Postoperative period frequency of rescue analgesic drugs, number of the patients discharged and the time of staying in the hospital were recorded.

RESULTS:

Table 1 shows the distribution of study sample by age, gender and weight. The age of the study sample was ranging from 18 to 57 years with a mean age of 36.4 years ± 8.156 years. The highest proportion of the total study groups was aged between 34-41 years 42.4%. In Group A, patients who aged 34-41 years were represented the highest proportion 58.8% and regarding group B, the highest proportion of patients was seen also among age 34-41 years which was 41.4%. Concerning weight, the highest proportion was those with weight ranged between 70-79 kg. The proportion of male patients was more than female patients 72.5% in the study sample. There was no statistically significant differences between age, gender and weight with study groups (caudal and saddle block) at their P-value 0.50, 0.617, and 0.071 respectively.

Figure 1 shows the distribution of the study sample by types of surgery. The highest proportion of surgery in the study sample was anal fissure 40%.

Table 2 shows he distribution of study sample by ASA score The distribution was highest in score I (68.75%) among a study sample, 45.4% of them in Group A and &54.5% in Group B .There was no statistically significant difference by ASA score with study groups (caudal and saddle block) at P-value 0.228 .

Table 3 shows a comparison between study groups regarding the onset of sensory block. Mean onset of sensory block was 16.25±2.239 min and 4.92±1.017 min in group A and group B respectively. There was statistically significant differences between study group and onset of sensory block at P-value 0.0001 and chi square 72.41.

Figure 2: Shows Distribution of study groups by the onset of sensory block.

Table 4 shows a comparison between study groups regarding the onset of motor block. Mean onset of motor block was 19.45±3.25 min in group A and there was no motor block in group B. There was statistically significant differences between study

group and onset of sensory block at P-value 0.0001 and chi square 72.41.

Table 5 shows the distribution of the study sample by systolic blood pressure. The highest proportion of the study sample was normotensive 68.7%. In group A and B 45.5% and 54.5% were normotensive. Mean systolic blood pressure in study sample was 133.6±111.8 mmHg. There were no statistically significant differences between study groups and systolic blood pressure at P-value 0.102.

Table 6 shows the distribution of the study sample by diastolic blood pressure. The highest proportion of the study sample was normotensive 68.7%. In group A and B 45.5% and 54.5% were normotensive respectively. Mean Diastolic blood pressure in study sample was 79.4±10.8 mmHg. There were no statistically significant differences between study groups and systolic blood pressure at P-value 0.102.

Table 7 shows the comparison between study groups regarding heart rate. The highest proportion of the study sample had normal heart rate 71.3%. In group A and B, 47.4% and 52.6 % of patient had a normal heart rate respectively. Mean heart rate in study sample was 84.0±16.7mmHg. There were no statistically significant differences between study groups and heart rate P-value 0.102.

Table 8 shows the Distribution of the study sample by oxygen saturation. There were no significantly differences in oxygen saturation between the two age groups.

Table 9 shows the distribution of the study sample by duration of surgery. The highest proportion of the study sample who had undergone surgery >120 min was 37.5% while patients in group A and B who had undergone surgery between 60-120 min had a highest proportion 55% and 62.5% respectively .

Table 10 shows the distribution of the study sample by times of analgesia which had taken post op. The highest proportion of the study sample was those who had taken analgesia one time post operation which was 55% and in group A was 26%, while in group B the highest proportion was those who had taken analgesia two times post op which was 45.5%. There were statistically significant differences between the study groups and the times of analgesia taken post operation P-value 0.00001. Table11: Distribution of the study sample by number of patients who were discharged from hospital at a mean time.

Table 1: Distribution of the study sample by certain demographic variables.

Demographic variables	Group A (n=40)		Group B (n=40)		Total (n=80)		P-value
	No.	%	No.	%	No.	%	
Age (years)							
18-25	3	50.0	3	50.0	6	7.5	0.50
26-33	10	43.4	13	56.5	23	28.7	
34-41	20	58.8	14	41.1	34	42.5	
42-49	2	25.0	6	75.0	8	10.0	
50-57	5	55.5	4	44.4	9	11.3	
Gender							
Male	30	51.7	28	48.2	58	72.5	0.617
Female	10	45.5	12	54.5	22	27.5	
Weight							
<60 kg	0	0.0	1	100	1	1.3	0.071
60-69 kg	12	50.0	12	50.0	24	30.0	
70-79 kg	25	59.5	17	40.4	42	52.5	
>= 80 kg	3	23.1	10	76.9	13	16.3	

Table 2: Distribution of the study sample by ASA score.

ASA score	Group A (n=40)		Group B (n=40)		Total (n=80)		P-value
	No	%	No	%	No	%	0.228
Score I	25	45.4	30	54.5	55	68.75	
Score II	15	60.0	10	40.0	25	31.25	

Table3: Comparison between study groups regarding onset of sensory block.

Sensory block	Group A		Group B		P-value	X^2
	Mean	SD	Mean	SD	0.0001	72.410
	16.25	2.239	4.92	1.017		

Table 4: Comparison between study groups regarding onset of motor block.

Motor block	Group A		Group B		P-value	X^2
	Mean	SD	Mean	SD	0.0001	72.410
	19.45	3.25	no	no		

Table 5: Distribution of the study sample by systolic blood pressure.

Systolic blood pressure	Group A (n=40)		Group B (n=40)		Total (n=80)		Mean	SD	P–value
	No.	(%)	No.	(%)	No	(%)	133.6	111.8	0.102
Hypotension (<100 mmHg)	10	76.9	3	23.0	13	16.2			
Normotension (100-130 mmHg)	25	45.5	30	54.5	55	68.7			
Hypertension (>130 mmHg)	5	41.7	7	58.3	12	15.0			

Table 6: Distribution of the study sample by diastolic blood pressure.

Mean diastolic blood pressure	Group A (n=40)		Group B (n=40)		Total (n=80)		Mean	SD	P–value
	No	(%)	No	(%)	No	(%)	79.04	10.8	0.102
Hypotension (<60mmHg)	10	76.9	3	23.0	13	16.2			
Normotension (60-80 mmHg)	25	45.5	30	54.5	55	68.7			
Hypertension (>80mmHg)	5	41.7	7	58.3	12	15.0			

Table 7: Comparison between the study groups regarding heart rate.

Heart rate	Group A (n=40)		Group B (n=40)		Total (n=80)		Mean	SD	P–value
	No.	(%)	No.	(%)	No.	(%)	84.0	16.7	0.102
Bradycardia(<60 bpm)	5	50.0	5	50.0	10	12.5			
Normal rate (60-100bpm)	27	47.4	30	52.6	57	71.3			
Tachycardia(>100bpm)	8	61.5	5	38.5	13	16.2			

Table 8: Distribution of the study sample by oxygen saturation.

Oxygen saturation	Group A (n=40)		Group B (n=40)		Total (n=80)		P-value
	No	(%)	No	(%)	No	(%)	0.311
>=98%	26	50.9	25	49.0	51	63.7	
<98%	14	48.2	15	51.7	29	36.2	

Table 9: Distribution of the study sample by duration of surgery.

Duration of surgery	Group A (n=40)		Group B (n=40)		Total (n=80)	
	No	(%)	No	(%)	No	Percentage (%)
< 60 min	10	47.6	11	52.3	21	33.8
60-120 min	22	81.4	25	92.6	27	28.7
>120 min	8	66.7	4	33.3	12	37.5

Table 10: Distribution of the study patients by times of analgesia taken post op.

Times of analgesia taken post op.	Group A (n=40)		Group B (n=40)		Total (n=80)		P –value
	No.	(%)	No.	(%)	No.	(%)	0.00001
none	9	100.0	0	0.0	9	11.3	
one time	26	59.0	18	40.9	44	55.0	
two times	5	20.8	19	79.2	24	30.0	
three times	0	0.0	3	100.0	3	3.8	

Table11: Distribution of the study sample by number of patients who were discharged from hospital at a mean time.

No. of patients who discharged from hospital at a mean time	Group A (n=40)		Group B (n=40)		Total (n=80)		P-value
	No	(%)	No	(%)	No	(%)	
< 360 min.	5	12.5	22	55.0	27	33.8	0.00001
360-480 min.	10	25.0	13	36.0	23	28.7	
>480 min.	25	62.5	5	12.5	30	37.5	

Figure 1 shows the distribution of the study sample by types of surgery. The highest proportion of surgery in the study sample was anal fissure 40%.

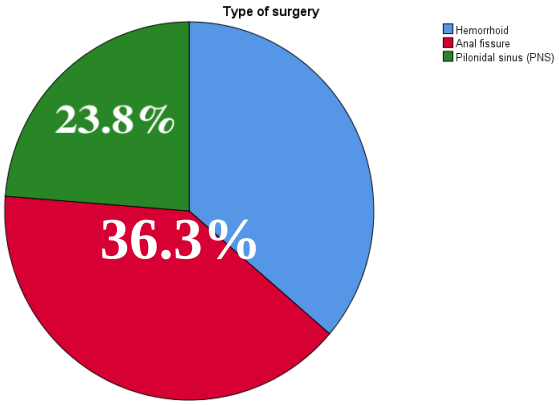

Figure 1: Distribution of study sample by types of surgery.

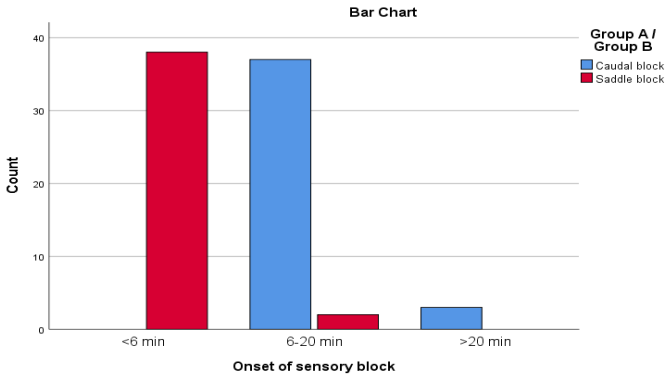

Figure 2: Distribution of study groups by the onset of sensory block

DISCUSSION:

The study demonstrates that there was no statistically significant differences between age, gender and BMI level with study groups which was in agreed with previous studies like study done in Korea which demonstrated that there was no significant differences observed between sex (P = 0.857), height (P = 0.065), obesity (P = 0.873), or age (P = 0.138) in their study groups which undergone regional block anesthesia.[6]

The study demonstrates that was zero motor block with saddle block compared with caudal block which was in agreed with previous studies like study done in Saudi Arabia which demonstrated that there was zero motor block with spinal saddle block in compared with other regional techniques depending on time of sitting.[7]

The study showed that onset of sensory loss in saddle block study group is more rapid than that in caudal block study group which was between 4-6 min in compared to 15-20 min respectively which was in agreed with previous studies like study done in India that showed 30 patients of average age 49.70 ± 12.22 years , average weight 58.23±9.71 kg and average height 153.00± 3.96 cms underwent anorectal surgical procedure with saddle block and sensory block was limited to posterior surface of lower limb including perineal skin within 6 minutes and lasted for approximately 3 hours.

The study demonstrated that the differences in heart rate between the study groups were statistically not significant which was in agreed with previous studies like study published by

Seyedhejazi and Zarrintan which indicated there was no significant alterations in heart rate of the subjects in caudal anesthesia using bupivacaine. Our study also agreed with study published by **Spear** that showed the caudal block with bupivacaine caused no clinically significant changes in heart rate in the subjects.[8]

The study demonstrated that there was no reduction in oxygen saturation among both study groups till the end of surgery which was in agreed with previous studies like study published by Seyedhejazi which demonstrated that caudal anesthesia performed in conscious infants for lower abdominal surgeries not suffered from a decrease in arterial oxygen saturation.[9]

The study demonstrated that there was no statistically significant differences in blood pressure which was recorded every 5 min till the end of surgery in both study groups which was in agreed with previous studies like study published by Vallath etal which done on 150 patients, who were made to sit for extended period of time after spinal anesthesia. They also found that hemodynamic stability can be improved by making the patients sit for a longer duration of time.[10] This study also agreed with study published by Ozmen *et al*. [11] which compared epidural (75 mg hyperbaric bupivacaine mixed with 50 mcg fentanyl), spinal (15 mg hyperbaric bupivacaine mixed with 50 mcg fentanyl), saddle (10 mg hyperbaric bupivacaine mixed with 50 mcg fentanyl) anesthesia during TURP. They found that intraoperative systolic arterial pressure remained more stable in the saddle group.[12]

The study showed that caudal block study group had a longer duration of analgesia post op. which was ranged 6 to 8 hours in comparable with saddle block study group which was ranged between 1 to 2 hours which was in agreed with previous studies like study published by Gabrielli and colleagues which included 193 patients and observed longer duration of analgesia associated with caudal block in comparison with other regional techniques. [13]

The study showed that the spinal saddle block study group associated with early hospital discharge which was ranged between 4 to 6 hrs. in comparable with caudal block study group which was ranged between 8 to 12 hrs. which was in agreed with previous studies like study done in Saudi Arabia that showed early hospital discharge associated with saddle block in comparable with caudal block.

CONCLUSION:

The saddle block provides rapid onset of sensory loss with zero motor block in comparison with caudal block.The duration of post-operative pain relief is longer with caudal block in comparison with saddle block.The frequency of analgesic drugs which was taken by the patients in the first 6hrs is more in saddle block group patients than in caudal block group patients.The saddle block is associated with early hospital discharge than in caudal block.

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