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Compartment and Sciatic Nerve Block for Knee Arthroplasty

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ABSTRACT

Background: Ambulatory knee procedures have become increasingly common due to the effectiveness of the anesthetic techniques that facilitate rapid and safe discharge.

Objective: To compare between spinal anesthesia versus ultrasound guided combined fascia iliaca compartment and sciatic nerve block for knee arthroplasty.

Patients and Methods: This study enrolled 40 patients (ASA) physical status (1, 2, 3), 20 patients in each group scheduled to undergo elective unilateral knee arthroplasty procedures. All patients of block group (group B) received premedication with 0.05 mg/kg midazolam intravenous injection. Group (S) (20) patients received spinal anesthesia attained by 20 mg/4ml of 0.5% heavy bupivacaine together with fentanyl 25 µg injected aseptically using a 22-G needle in subarachnoid space at the L4-5 level then the patients were required to wait in the lateral decubitus position on operated side for 5 minutes. Group (B) (20) patients received ultrasound guided combined fascia iliaca compartment and sciatic nerve block using a 22-G needle.

Results: In the present study, sufficient block could not be obtained in two patients in block group, they shifted to general anesthesia and excluded from the evaluation, and we replaced them by two other patients.

Conclusion: The preferential selection and successful use of anesthesia techniques are based on not only having a short preparation time and rapid onset of action, but also on providing lower rate of complications and adverse events, a longer duration of analgesia, good patient satisfaction and optimal condition for patient discharge compared with other available agents.

Keywords: Visual analogue scale, surgical anesthesia time, Total-knee joint arthroplasty

INTRODUCTION

Ambulatory orthopaedic procedures have become increasingly common due to the effectiveness of the anesthetic techniques that facilitate rapid and safe discharge [(1)].

Regional anesthesia techniques are used as an alternative to general anesthesia in these procedures. It is generally accepted that both peripheral nerve blocks and spinal anesthesia provide sufficient anesthesia, better postoperative analgesia and satisfaction than general anesthesia, in addition to being minimally invasive and using less resources [(2)].

Spinal anesthesia is particularly preferred by patients undergoing unilateral lower limb surgery due to the fact that only the desired region undergoes nerve blockade, which results in early mobilization and good patient satisfaction [(3)].

These patients are also poor candidates for general anesthesia because they have diseases such as diabetes and hypertension and a decreased systemic functional reserve [(4)].

Anatomical deformities in the aforementioned patients also reduce the success of regional anesthesia [(5)].

Sudden hemodynamic changes during spinal anesthesia pose an additional risk due to the presence of accompanying diseases and previous neurological disorders [(4)].

Spinal anesthesia is widely used for lower limb surgery in the elderly for efficacy, rapidity, minimal effect on mental status, reduction of blood loss, and protection against thrombo-embolic complications. But risk of severe and prolonged hypotension is associated with spinal anesthesia. This is due to the rapid extension of the sympathetic block, hindering cardiovascular adaptation and causing significant morbidity and mortality [(6)].

As quadruple nerve blocks of the lower extremities require high-dose local anesthetics, the risk of systemic side effects is increased. Nevertheless, these blocks are preferred for analgesia. The use of ultrasonography (USG)

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during peripheral blocks increases their effectiveness and decreases the amount of anesthetics required [7].

The selection of the anesthetic technique and the anesthetic agents are important as the adverse events and complications affect discharge time in ambulatory cases [8].

AIM OF THE WORK

The aim of the present study is to compare between spinal anesthesia versus ultrasound guided combined fascia iliaca compartment and sciatic nerve block for knee arthroplasty.

PATIENTS AND METHODS

Study settings: The study was carried out in AL-Azhar University Hospitals. **The study was approved by the Ethics Board of Al-Azhar University.**

Inclusion criteria: After obtaining the Research/Ethics Committee approval and informed written consent from 40 patients who had the following criteria:- ASA physical status: (1, 2, 3) with pre-existing medical condition. Both sexes (male and female). Aged from 40 to70 years. Patient height 150-185 cm. Patient weight 50-120 kg. Undergoing unilateral knee arthroplasty.

Exclusion criteria: Patient refusal and uncooperative patients. Patient with history of allergic reaction to local anesthetics or opioids. Presence of preoperative hypovolemia. Contraindications to neuraxial anesthesia.

Methods of randomization Randomization of patients was done using a computerized program (SPSS). The number of cases included in this study was simple randomly allocated into two groups (20 in each group).

Study groups:

This study was conducted on 40 patients. They were classified into two groups: Group S* (*Spinal group): included 20 patients, a 22-G needle in subarachnoid space at the L4-5 levels. ***Group B (Block group):*** included 20 patients, undergoing ultrasound guided combined fascia iliaca compartment and sciatic nerve block.

Anesthesia technique: All patients were requested to be fasting for 8 h. before operation. Spinal anesthesia and block technique were explained to them preoperatively.

Patient monitoring: Pulse oximetry. ECG. Non-invasive blood pressure monitoring.

Premedication: All patients of block group were pre-medicated with intravenous midazolam (0.05 mg/kg) 10 min. before the block.

Induction*:* Group S (Spinal group): in this group, spinal anesthesia was attained with 20 mg/4ml of 0.5% heavy bupivacaine together with fentanyl 25µg injected aseptically using a 22-G needle in subarachnoid space at the L4-5 levels then the patients were required to wait in the lateral decubitus position on operated side for 5 minutes. Group B (block group): this group were administered fascia iliaca compartment and sciatic nerve block using ultrasonography, (25-G Braun needle, Melsungen, Germany). For the sciatic nerve block, 62.5 mg/12.5 ml of 0.5% bupivacaine were mixed with 100 mg/10 ml of 1% lidocaine. For fascia iliaca compartment block, 37.5 mg of 0.5% bupivacaine 7.5 ml were added 100 mg/10 ml of 1% lidocaine.

Collected data:

Demographic and clinical data: including age, sex, weight, height, ASA physical status and duration of surgery were recorded.

Vital data: including heart rate, arterial blood pressure (systolic, diastolic and MAP), oxygen saturation and respiratory rate were recorded at base of beginning of surgery, 5, 10, 15, 20, 30 minutes, 1, 1.30, 2,4, 6,12, 18, 24 hours.

Onset time of injection (preparation time): time from skin preparation of the application site to end of local anesthetics injection was recorded.

Sensory block: Upper level of sensory block assessed by **pinprick test** using 22 gauge blunted needle in the midline and the highest dermatomal level of sensory block was recorded.

Statistical Analysis

Data were collected, revised, coded and entered to the Statistical Package for Social Science (SPSS) version 23 and the following were done:

Qualitative data were presented as number and percentages while quantitative data were presented as mean, standard deviations and ranges.

The comparison between two groups with qualitative data were done by using Chi-square test and/or Fisher exact test was used instead of Chi-square test when the expected count in any cell was found less than 5.

The comparison between two independent groups with quantitative data and parametric distribution was done by using Independent t-test.

The comparison between more than two groups with parametric distribution were done by using One Way Analysis of Variance (ANOVA).

Pearson correlation coefficients were used to assess the relation between two studied parameters in the same group.

Receiver operating characteristic curve was used to assess the best cut off point with its sensitivity, specificity, positive predictive value and negative predictive value.

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: P > 0.05: Non significant. P < 0.05: Significant. P < 0.01: Highly significant.

RESULTS

Table (1): Difference between group (S) and group (B) regarding mean arterial blood pressure

As regard mean arterial blood pressure		**Group S**	**Group B**	**Test value•**	**P-value**	**Sig.**
		No. = 20	**No. = 20**			
base 0 min	Mean±SD Range	83.00±5.82 73–91	105.60±7.37 94–120	-10.759	0.001	HS
5 min	Mean±SD Range	69.85±6.79 60–80	105.65±7.36 95–120	-15.989	0.001	HS
10min	Mean±SD Range	64.40±5.09 55–74	103.15±4.75 95–110	-24.886	0.001	HS
15 min	Mean±SD Range	63.30±3.91 57–70	103.25±6.13 90–115	-24.578	0.001	HS
20 min	Mean±SD Range	65.15±2.96 60–70	104.00±5.28 90–110	-28.695	0.001	HS
30 min	Mean±SD Range	63.80±2.69 59–69	109.35±5.96 98–120	-31.165	0.001	HS
1hour	Mean±SD Range	83.00±5.82 73–91	105.60±7.37 94–120	-10.759	0.001	HS
1.30hour	Mean±SD Range	88.10±6.03 80–100	108.60±6.59 100–120	-10.261	0.001	HS
2 hours	Mean±SD Range	88.10±6.03 80–100	108.60±6.59 100–120	-10.261	0.001	HS
4 hours	Mean±SD Range	104.2±9.0 80–100	108.60±6.59 100–120	1.764	0.086	NS
6 hours	Mean±SD Range	104.5±7.0 80–100	108.60±6.59 100–120	1.907	0.064	NS
12 hours	Mean±SD Range	105.0±13.0 80–100	108.60±6.59 100–120	1.105	0.276	NS
18 hours	Mean±SD Range	106.0±13 80–100	108.60±6.59 100–120	0.798	0.430	NS
24 hours	Mean±SD Range	107.2±13 80–100	108.60±6.59 100–120	0.430	0.670	NS

P-value >0.05: Non significant (NS); P-value <0.05: Significant (S); P-value< 0.01: highly significant (HS)

•: Independent t-test

Table (2): Difference between group (S) and group (B) regarding regard oxygen saturation (spo2%).

As regard oxygen saturation (spo2%)		Group S	Group B	Test value	P-value	Sig.
		No. = 20	No. = 20			
base 0 min	Mean±SD	98.65±0.81	98.65±0.81	0.000	1.000	NS
	Range	97–100	97–100			
5 min	Mean±SD	98.65±0.81	98.65±0.81	0.000	1.000	NS
	Range	97–100	97–100			
10min	Mean±SD	98.65±0.81	98.65±0.81	0.000	1.000	NS
	Range	97–100	97–100			
15 min	Mean±SD	98.65±0.81	98.65±0.81	0.000	1.000	NS
	Range	97–100	97–100			
20 min	Mean±SD	98.65±0.81	96.10±0.79	10.074	0.001	HS
	Range	97–100	95–98			
30 min	Mean±SD	98.65±0.81	96.10±0.79	10.074	0.001	HS
	Range	97–100	95–98			
1hour	Mean±SD	98.65±0.81	94.80±0.70	16.092	0.001	HS
	Range	97–100	94–96			
1.30hour	Mean±SD	98.65±0.81	94.80±0.70	16.092	0.001	HS
	Range	97–100	94–96			
2 hours	Mean±SD	98.60±0.75	94.80±0.70	16.564	0.001	HS
	Range	97–100	94–96			
4 hours	Mean±SD	98.55±0.69	97.0±3.55	-1.917	0.063	NS
	Range	97–100	94–96			
6 hours	Mean±SD	98.50±0.61	97.5±2.3	-1.879	0.068	NS
	Range	97–99	95–98			
12 hours	Mean±SD	98.50±0.61	97.8±1.5	-1.933	0.061	NS
	Range	97–99	95–98			
18 hours	Mean±SD	98.50±0.61	97.8±1.5	-1.933	0.061	NS
	Range	97–99	95–98			
24 hours	Mean±SD	98.50±0.61	97.8±1.5	-1.933	0.061	NS
	Range	97–99	95–98			

P-value >0.05: Non significant (NS); P-value <0.05: Significant (S); P-value< 0.01: highly significant (HS)
•: Independent t-test

Table (3): Difference between group (S) and group (B) regarding heart rate

As regard heart rate		Group S	Group B	Test value•	P-value	Sig.
		No. = 20	No. = 20			
base 0 min	Mean±SD	79.10±3.0	78.0±0.85	-1.578	0.123	NS
	Range	77–80	77–80			
5 min	Mean±SD	88±4.3	86±1.39	-1.979	0.055	NS
	Range	77–82	77–82			
10min	Mean±SD	90.0±2.3	89±0.85	-1.824	0.076	NS
	Range	77–80	77–80			
15 min	Mean±SD	91.0±1.39	90.0±2	-1.836	0.074	NS
	Range	77–82	77–82			
20 min	Mean±SD	91.0±1.39	90.0±2	-1.836	0.074	NS
	Range	77–82	77–82			
30 min	Mean±SD	91.0±1.39	90.0±2	-1.836	0.074	NS
	Range	77–82	77–82			
1hour	Mean±SD	93.0±0.85	92.8±1.5	-0.519	0.607	NS
	Range	77–80	77–80			
1.30hour	Mean±SD	93.0±0.85	92.8±1.5	-0.519	0.607	NS
	Range	77–80	77–80			
2 hours	Mean±SD	92.8±0.50	91.9±2.1	-1.865	0.070	NS
	Range	77–80	77–80			
4 hours	Mean±SD	85.0±1.39	84.3±1.39	-1.593	0.120	NS
	Range	77–82	77–82			
6 hours	Mean±SD	80.0±0.85	79.90±0.85	-0.372	0.712	NS
	Range	77–80	77–80			
12 hours	Mean±SD	80.9±1.4	79.9±2.0	-1.832	0.075	NS
	Range	77–82	77–82			
18 hours	Mean±SD	80.0±0.85	79.50±0.85	-1.860	0.071	NS
	Range	77–80	77–80			
24 hours	Mean±SD	81.1±1.39	80.65±1.39	-1.024	0.312	NS
	Range	77–82	77–82			

P-value >0.05: Non significant (NS); P-value <0.05: Significant (S); P-value< 0.01: highly significant (HS)

•: Independent t-test

Table (4): Difference between group(S) and group (B) regarding respiratory rate

As regard respiratory rate		Group S No. = 20	Group B No. = 20	Test value•	P-value	Sig.
base 0 min	Mean±SD Range	17.0 ± 0.67 16 – 18	16.65±0.67 16–18	-1.652	0.107	NS
5 min	Mean±SD Range	17.5± 0.60 17 –19	17.55±0.60 17–19	0.264	0.794	NS
10min	Mean±SD Range	17.2 ± 1.2 16 – 18	16.65±0.67 16–18	-1.790	0.082	NS
15 min	Mean±SD Range	18.0 ± 1.2 17 – 19	17.55±0.60 17–19	-1.500	0.142	NS
20 min	Mean±SD Range	17.0 ± 1.1 16 –18	16.65±0.67 16–18	-1.215	0.232	NS
30 min	Mean±SD Range	18.0 ± 0.99 17 – 19	17.55±0.60 17–19	-1.738	0.090	NS
1hour	Mean±SD Range	17.2± 1.3 16 – 18	16.65±0.67 16–18	-1.682	0.101	NS
1.30hour	Mean±SD Range	18.1 ± 1.3 17 – 19	17.55±0.60 17–19	-1.718	0.094	NS
2 hours	Mean±SD Range	17.0 ± 1.1 16 – 18	16.65 ± 0.67 16 – 18	-1.300	0.201	NS
4 hours	Mean±SD Range	18.1 ± 1.8 17 – 19	17.55 ± 0.60 17 – 19	-1.296	0.203	NS
6 hours	Mean±SD Range	17.1 ± 1.2 16 – 18	16.65 ± 0.67 16 – 18	-1.464	0.151	NS
12 hours	Mean±SD Range	18.2 ± 1.50 17 – 19	17.55 ±0.60 17 – 19	-1.799	0.080	NS
18 hours	Mean±SD Range	17.0 ± 1.2 16 – 18	16.65 ± 0.67 16 –18	-1.139	0.262	NS
24 hours	Mean±SD Range	18.0 ± 1.30 17 – 19	17.55 ± 0.60 17 – 19	-1.406	0.168	NS

P-value >0.05: Non significant (NS); P-value <0.05: Significant (S); P-value< 0.01: highly significant (HS)

•: Independent t-test

Table (5): Difference between group (S) and group (B) regarding preparation time (PT) and surgical anesthesia time (SAT)

	Group s No. = 20	Group B No. = 20	Test value•	P-value	Sig.
Preparation time (min)	4.85 ± 0.58	25.2 ± 0.61	108.121	0.001	HS
Surgical anesthesia time (min)	9.88 ± 2	16.88 ± 1.6	12.223	0.001	HS

P-value > 0.05: Non significant; P-value < 0.05: Significant; P-value < 0.01: Highly significant

•: Independent t-test

Table (6): Difference between group (S) and group (B) regarding degree of motor block

	Group S	Group B	Test value	P-value	Sig.
	No. = 20	No. = 20			
Onset of motor block (min)	6.52 ± 2	23.8 ± 6	12.219•	0.000	HS
Grade of motor block after 1 hour					
I	0 (0.0%)	0 (0.0%)			
II	0 (0.0%)	0 (0.0%)	12.907*	0.001	HS
III	2(10.0%)	13 (65.0%)			
IV	18 (90%)	7 (35.0%)			
Grade of motor block after 4 hours					
I	20 (100.0%)	6 (30.0%)			
II	0 (0.0%)	3 (15.0%)	21.538*	0.001	HS
III	0 (0.0%)	11 (55.0%)			
IV	0 (0.0%)	0 (0.0%)			
Intra operative free movement of knee joint					
Excellent	15 (75.0%)	18 (90.0%)	1.558**	0.459	NS
Sufficient	5 (25.0%)	2 (10.0%)			
Insufficient	0 (0.0%)	0 (0.0%)			

P-value > 0.05: Non significant; P-value < 0.05: Significant; P-value < 0.01: Highly significant
*: Chi-square test; •: Independent t-test

Table (7): Description of the Bromage score. Grade Criteria Degree of Block

Grade	Criteria	Degree of block
I	Free movement of leg, feet	N.T (0)
II	Just able to flex knee with free movement of feet	Partial (33%)
III	Unable to flex knee but free movement of feet	Almost complete (66%)
IV	Unable to move leg or feet	Complete (100%)

Table (8): Difference between group (S) and group (B) regarding visual analogue score (VAS)

	Group s	Group B	Test value•	P-value	Sig.
	No. = 20	No. = 20			
VAS score					
Baseline	1.5 ± 0.35	1.5 ± 0.45	0.000	1.000	NS
15 min	1 ± 0.2	1 ± 0.28	0.000	1.000	NS
30 min	1 ± 0.23	1 ± 0.37	0.000	1.000	NS
45 min	1 ± 0.27	1 ± 0.35	0.000	1.000	NS
60 min	1 ± 0.3	1 ± 0.39	0.000	1.000	NS
75 min	1 ± 0.25	1 ± 0.32	0.000	1.000	NS
90 min	1 ± 0.32	1 ± 0.22	0.000	1.000	NS
105 min	1 ± 0.34	1 ± 0.24	0.000	1.000	NS
120 min	1 ± 0.36	1 ± 0.25	0.000	1.000	NS
4 hr	3 ± 0.4	2 ± 0.34	-8.519	0.001	HS
6 hr	3 ± 0.46	2 ± 0.3	-8.143	0.001	HS
10 hr	3 ± 0.5	1.5 ± 0.38	-10.682	0.001	HS
18 hr	3 ± 0.55	2 ± 0.55	-5.750	0.001	HS
24 hr	3 ± 0.52	2 ± 0.52	-6.081	0.001	HS

P-value > 0.05: Non significant; P-value < 0.05: Significant; P-value < 0.01: Highly significant
*: Chi-square test; •: Independent t-test

Table (9): Difference between group (S) and group (B) regarding total anesthesia time (TAT) and the time of first postoperative analgesia.

	Group S	Group B	Test value•	P-value	Sig.
	No. = 20	No. = 20			
Total anesthesia time (min)	160 ± 20	340.8 ± 36.69	19.350	0.001	HS
Time of 1st post operative analgesia (min)	175.75 ± 17.2	360.88 ± 21.2	30.327	0.001	HS

P-value > 0.05: Non significant; P-value < 0.05: Significant; P-value < 0.01: Highly significant
•: Independent t-test

Table (10): Difference between group (S) and group (B) regarding intraoperative complications

Intraoperative complications	Group S	Group B	Test value*	P-value	Sig.
	No. (%)	No. (%)			
No	11 (55.0%)	20 (100.0%)	11.613	0.009	HS
Hypotension	5 (25.0%)	0 (0.0%)			
Nausea, vomiting	3 (15.0%)	0 (0.0%)			
Bradycardia	1 (5.0%)	0 (0.0%)			

P-value > 0.05: Non significant; P-value < 0.05: Significant; P-value < 0.01: Highly significant
*: Chi-square test

Table (11): Difference between group (S) and group (B) regarding postoperative complications

Postoperative complications	Group S	Group B	Test value*	P-value	Sig.
	No. (%)	No. (%)			
No	10 (50.0%)	20 (100.0%)	13.333	0.009	HS
Headache	4 (20.0%)	0 (0.0%)			
Nausea& vomiting	3 (15.0%)	0 (0.0%)			
Backache	2 (10.0%)	0 (0.0%)			
Retention of urine	1 (5.0%)	0 (0.0%)			
Itching& pruritus	0 (0.0%)	0 (0.0%)			
Neurological sequelae	0 (0.0%)	0 (0.0%)			

P-value > 0.05: Non significant; P-value < 0.05: Significant; P-value < 0.01: Highly significant
*: Chi-square test

Table (12): Difference between group (S) & group (B) regarding patient satisfaction

Patient satisfaction	Group S	Group B	Test value*	P-value	Sig.
	No. (%)	No. (%)			
Perfect	15 (75.0%)	6 (30.0%)	8.622	0.035	S
Acceptable	4 (20.0%)	13 (65.0%)			
Poor	1 (5.0%)	1 (5.0%)			
Unsuccessful	0 (0.0%)	0 (0.0%)			

P-value > 0.05: Non significant; P-value < 0.05: Significant; P-value < 0.01: Highly significant
*: Chi-square test

Table (13): Difference between group (S) & group (B) regarding surgeon satisfaction

Surgeon satisfaction	Group S	Group B	Test value*	P-value	Sig.
	No. (%)	No. (%)			
Perfect	11 (55.0%)	9 (45.0%)	0.400	0.527	NS
Acceptable	9 (45.0%)	11 (55.0%)			
Poor	0 (0.0%)	0 (0.0%)			
Unsuccessful	0 (0.0%)	0 (0.0%)			

P-value > 0.05: Non significant; P-value < 0.05: Significant; P-value < 0.01: Highly significant
*: Chi-square test

DISCUSSION

Ambulatory orthopaedic procedures have become increasingly common due to the effectiveness of the anesthesia techniques that facilitate rapid and safe discharge [1].

Both peripheral nerve blocks and spinal anesthesia provide sufficient anesthesia, better postoperative analgesia, and satisfaction than general anesthesia, in addition to being minimally invasive and using fewer resources [2].

Spinal anesthesia is particularly preferred by patients undergoing unilateral lower limb surgery due to the fact that only the desired region undergoes nerve blockade, which results in early mobilization and good patient satisfaction [3].

The selection of the anesthesia technique and the anesthetic agents are important as the adverse events and complications affect discharge time, ultrasound fascia iliaca compartment and sciatic nerve block appears to be a good alternative for spinal anesthesia in ambulatory knee surgery [9].

In the present study, sufficient block could not be obtained in two patients in block group, they shifted to general anesthesia and excluded from the evaluation, and we replaced them by two other patients.

Also in the present study there was no statistically difference in the demographic data between the two groups regarding age, sex, weight, height, ASA, and duration of surgery.

These results coincide with the results reached by ***Davarci and his colleagues*** who compared spinal anesthesia with sciatic and femoral nerve block on 40 patients scheduled to undergo ambulatory arthroscopic knee surgery. ***They found*** no statistically difference between two groups regarding demographic and hemodynamic data at variable times intraoperatively [10].

Also no statistically significant difference was found among the two groups as regard measurement of heart rate and respiratory rate except there was non-significant increase in heart rate in group (S) than group (B) at first 120 minutes due to reflex tachycardia of ephedrine which was given to correct hypotension.

But there was significant statistically difference in mean arterial blood pressure at first 12o minutes and oxygen saturation measurement from 20 to 120 minutes (due to using sedoanalgesia from the start) intraoperatively.

These results coincide with the results reached by ***Akkaya and his colleagues*** performed a study on ultrasound-guided femoral and sciatic nerve blocks combined with sedoanalgesia versus spinal anesthesia. Sedoanalgesia was given with 1 mg of midazolam, 50 µg fentanyl, and 1o-15 mg ketamine from the start [11].

Mean arterial pressure was significantly lower in the spinal group this may be attributed to the large dose of local anesthetic (4 ml) during spinal anesthesia. oxygen saturation was decreased in the block group up to 92%, this may be due to using sedoanalgesia from the start [11].

But in the present study there was statistically difference in haemodynamic data as mean arterial blood pressure measurement and oxgen saturation.

Also in the present study we used ultrasound guided fascia iliaca compartment block instead femoral nerve block.

In the present study the mean preparation time (PT) was 5 min. in group S, but then the patients were required to wait in the lateral decubitus position on the operated side for 5 min; so the mean total time before the initiation of surgery was 10 min. In group B, the mean PT for the fascia iliaca compartment and sciatic nerve block was 15 min followed by a mean of 25 min before the nerve blockade was achieved; thus the mean total time before the initiation of surgery was 40 min. When the two groups were compared, there was a 3o-min delay prior to surgery in the block group which is statistically significant.

Davarci and his colleagues found that there was a 7-min delay prior to surgery in the USFB group which is lower than the present study by 23 min, they did not block (FIC) which may be the cause [10].

In the present study there was no significant difference between the two groups regarding intraoperative free movement of the knee joint by surgeon. This was also the case with ***Davarci1and his colleagues; they also did not find*** any significant difference between the two groups [10].

In the present study, it was observed a statistically significant difference between the two groups as regard the grades of motor block where group S showed more solid motor block than group B after 1 hour, whereas it showed full recovery from motor block after 4 hours, on

the other hand in group B 11 patients still had residual motor block grade III.

These results coincide with that concluded by ***Davarci and his colleagues.*** They found that the difference between the two groups in terms of motor blockade was significantly higher in spinal group after 1 hour, whereas after 4hrs, motor block was higher in block group where 14 patients still had grade II motor blockade, while none of the patients in spinal group had motor blockade at the same time-point **[10].**

In the present study SAT was significantly lower in group S (9 min) compared to group B (17 min).

These results coincide with the results found by ***Davarcil and his colleagues***, they found that spinal group had significantly shorter delay time (8 minutes) before the beginning of surgery compared to (18 minutes) in the combined sciatic–femoral block group **[10].**

In the present study, it was noticed that significantly longer total anesthesia time (TAT) in group B when compared with group S which was also the case with ***Davarcil and his colleagues*** **[10].**

The presence of sufficient postoperative analgesia is essential to facilitate rehabilitation after knee arthroplasty. This was noted in the present study as group (B) had significantly longer time to first analgesia than group (S). This was obvious when additional analgesia was needed after a mean of 175 min. in group (S), while it was needed after 360 min. in group (B).

These results coincide with the results reached by **Spasiano *and his colleagues,*** where they found that time to first analgesia was significantly longer in block group than spinal group. Only one patient per group required additional analgesia after 230 min. in the spinal group compared with SFNB group after 31o min. **[12].**

In the present study, regarding (1o-cm) VAS, the group (B) provided significantly more effective analgesia than group (S) at 4, 6, 10, 18 and 24 hours postoperatively, which was also the case with ***Davarci and his colleagues*** **[1o].**

In the present study, urinary retention was recorded in group (S) more than group (B).

Davarci1 and his colleagues agreed with our study and found that time-to-first spontaneous urination was significantly longer in the spinal group despite of the rapid resolution of the nerve block group **[10].**

In the present study both patient and surgeon satisfactions were acceptable.

But patient satisfaction was higher in group (S) than group (B). On other hand no difference between the two groups in surgeon satisfaction.

These results coincide with the results reached by ***Akkaya and his collegues, they found that*** patient satisfaction differed significantly and the overall median patient satisfaction value in spinal group and block group were 3:2 respectively **[11].**

CONCLUSION

In conclusion, the preferential selection and successful use of anesthesia techniques are based on not only having a short preparation time and rapid onset of action, but also on providing lower rate of complications and adverse events, a longer duration of analgesia, good patient satisfaction and optimal condition for patient discharge compared with other available agents.

It can be possible to achieve SAT and PT with ultrasound-guided combined sciatic–fascia iliaca compartment block (FICB) as those achieved with spinal anesthesia in patients undergoing surgical procedures of the lower extremities by increasing the experience of the anesthesia team of using ultrasound guidance.

Although ultrasound guided combined fascia iliaca compartment and sciatic nerve block having longer PT and SAT but also have minimal effect on hemodynamics, longer duration of analgesia and motor block, lower rate of complications and adverse events, and optimal conditions for patient discharge compared with spinal anesthesia.

Taking these current findings into consideration, ultrasound guided combined fascia iliaca compartment and sciatic nerve block appears to be a good alternative for spinal anesthesia in knee arthroplasty especially for obese and hemodynamically unstable patients and also it needs further studies on large number of patients.

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