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Isobaric Ropivacaine 0.5% Vs 0.75% as Spinal Anesthesia

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Aims

Aims of this study is to compare the clinical effectsof 3ml of 0.5% isobaric Ropivacaine and 3ml of 0.75% isobaric ropivacaine when given intrathecally (sub arachnoid block).

Primary Objectives:

Definitions of each parameter s were mentioned latter

a) Onset of action sensory blockade Assessed by loss of pin prick sensation
b) Onset of motor blockade
   By modified Bromage scale
c) Maximal sensory dermatomes blocked
d) Time taken for maximal sensory blockade
e) Degree of maximal motor blockade and time taken for the same
f) Total duration of analgesia (sensory blockade) Assessed first request of analgesia from onset of analgesia
g) Total duration ofMotor Blockade Assessed by modified bromage scale.

Secondary objects:

Definitions of each parameter s were mentioned latter

h] Any intra operative discomfort/ complications. As determined by perception of dragging sensation or pain and need for anysystemic analgesic agents.

i). intraop and post operative complications intraop and post operative complications such as bradycardia ,hypotension, nausea, vomiting, shivering and headache.

Materials and methods:

After obtaining approval from hospital scientific and ethics committee, and writteninformed consent ,60 patients will be enrolled in the study.30 patients in each group A&B.

The study population includes patients of either sex, ASA gr 1 and 2, in ages between 18-75 yr. All patients posted for low limb surgeries who will undergo spinal anaesthesia were include in the study as per inclusion and exclusion criteria.

Study Design:

Study will be prospective, randomized, non-blinded and controlled study.

Study area/ study site:

Dept. of Anesthesiology. Seven Hills Hospital,Visakhapatnam, Andhrapradesh

Study time frame:

From may 2014 to April 2015

Study Population:

Patients of either sex, between ages of 18 year to 75 years undergoing elective lower extremity surgeries [with expected total duration of surgery < 2 hrs] under spinal anesthesia.

Sample size and sample technique:

60 patients who come for elective lower limb surgeries are randomly selected for the study without any bias based on inclusion and exclusion criteria using a computer based software programme.30 patients were allotted to each group as per computer based software proagrame.

Inclusion criteria:

Age 18-60 year
ASA Grade I & II Elective lower limb surgeries [with expected duration of surgery less than 2 hrs]

Exclusion Criteria:

Consent not given
ASA grade III & IV
Any bleeding disorders& patients on anticoagulants
Neurological deficits involving lower extremities
Local infection at site of injection
H/o allergy to LA
Pregnant women
Height less than 150 cm
Emergency surgeries

METHODOLOGY

After approval from institutional ethical committee, proper written informed consent from the patients who are included in this study will be randomly divided in 2 groups of 30 patients each, based on computer based randomization technique.Chart of randomization was attached at the end of this protocol.

Group. A [group 0.5] : Given 3ml of 0.5% Isobaric Ropivacaine intrathecally (at L3-L4 level)(sitting position).

Group. B [group 0.75] : Given 3 ml of 0.75% Isobaric Ropivacaine intrathecally(at L3-L4 level)(sitting position).

After taking consent, patient will be given premedication with tab Alprazolam 0.5 mg and Tab Ranitidine 150 mg day before surgery at night time. On the day of surgery patient shifted into operation theatre,18G iv canula was secured and preloaded with 500ml crystalloid in both groups 30 min prior to anaesthesia .All moniters[ECG,NIBP,SPO2] were connected. Under strict aseptic conditions spinal anaesthesia was given with 25 G quinke needle in L3-L4 space in sitting position in both the groups.

As per randomization done by computer based software proagramme patients will be given spinal anaesthesia with 3 ml of 0.5% and 0.75% ropivacaine [study was non blinded study] .

After giving spinal anaesthesia patient will be made supine and sensory and motorblockade and haemodynamic parameters checked.

Sensory blockade was checked for loss of sensation to blunt tipped needle along mid axillary line , onset time,maximal cephaladal spread and regression to T10 level and first request of analgesics will be observed.

Sensory block will be assessed by 24 G Blunt tip needle for loss of pin prick sensation at 1 minute interval for first 15 min, along anterior axillary line and timely interval there after.

Onset time of sensory block is the time required for loss of pin prick sensation at T10 dermatome level after giving spinal injection in minutes.

Maximum dermatomal level of sensory block attained will be observed (for loss of pin prick sensation from cephaladal to caudal direction taking clavicle as reference point) in timely interval after attaining T10 dermatomal level block. Time taken for the same is noted from time of spinal injection .

Number of maximum dermatomes blocked will be noted in each group. Regression time is time taken for regression of senory block to T12 dermatomal level from the onset time of sensory blockade. Sensory block was moniterd till request of first dose of analgesic time from onset of sensory block T 10 to first request of analgesic considered as total duration of sensory block.

Motor blockade will be asseed by bromage scale , onset of motor blockade, quality of motor blockade, duration of motor blockade were assessed Onset time of motor blockade is time from injection of drug to patients inability to lift the extended leg straight in minutes .[grade 1 blockade] Duration of block will be recorded from onset time of motor block to time when patient was able to lift extended leg.[grade 1 to grade 1 block] Degree of motor blockade based on bromage scale.

Haemodynamic parameters were monitored PR.SBP.DBP.MAP,SPO2 in frequent intervals till patient recovers from motor blockade. Adverse affects like bradycardia, hypotension, nausea and vomtings, shivering, head ache,pruritis will be noted.

HR<60 considered as brady cardia. Trated with inj atropine 0.6 mg iv. SBP < 90 will be considered as hypotension treated with inj mephetermine 6 mg iv boluses. Nausea and vomtings were treated with inj ondonsetron 4 mg iv Shivering will be treated with inj pethidine iv

Drug Dosage:

Group A[Group 0.5] Receives – 3 ml of Isobaric 0.5% Ropivacine (intrathecally L3-L4 level,Sitting position)

Group B[Group 0.75] Receives – 3 ml of Isobaric 0.75% Ropivacaine(intrathecally L3-L4 level,sitting position)

Monitering

Heart rate
Sp02
ECG – Rate/Rhythm
NIBP(SBP,DBP,MAP)

Instruments

25 G Qunike Spinal Needle
ECG Electrodes

5 ml syringe
Skin marker pencil
Sterile gloves
Two stainless steel sterile bows
24 G im needle

Parameters to be studied

a) Onset time of sensory block:

Assessed by 24 G Blunt tip needle for loss of pin prick sensation at 1 minute interval interval till sensory block attained at T10 level along anterior axillary line . from there after sensory block will be assessd every 5 min for first 30 min. and timely interval there after till request of first analgesics

Onset time of sensory block is time required for loss of pin prick sensation at T10 dermatome level after giving spinal injection in minutes.

b) Maximum level of sensory block attained and time taken for the same

Maximum dermatomal level of sensory block attained was observed (for loss of pin prick sensation from cephaladal to caudal direction taking clavicle as reference point) in every 5 minutes interval after first 15 min for first 30 min. Time taken for the same is noted from time of spinal injection . Number of maximum dermatomes blocked were noted in each group.and time taken for it noted

c) Sensory regression time [time at T 10 dermatomal level ie regression of sensory block to T 12 dermatome]

Its time taken for regression of senory block to T12 dermatomal level from onset time of sensory block [initial attained time of sensory blockade at T10 level after spinal injction]

d) Onset and duration and highest quality of motor blockade:

This is assessed by Bromage scale.

Onset time is time from injection of drug to patients inability to lift the extendedleg straight.[grade 1 blockade] , quality of motor block will be observed for every 1 min for first 15 min and thereafter every 5 min for next 15 minutes and timely interval thereafter.

Duration of block was recorded from onset time to time when patient was able to lift extended leg.[grade 1 to grade 1 block]

Table 2: Bromage Scale:

Grade	Definition
0	No motor block
1	Inability to raise the extended leg , able to move knees and feet.
2	Inability to raise extended leg and move knee, able to move feet.
3	Complete block of motor limb

Duration of sensory blockade

Assessed by time of request of analgesic from onset time of spinal anaesthesia in min

Duration of motor blockade

Its time taken from onset of motor blockade to grade 1 motor blockade in min

Data Analysis:

Data will be collected from study proformas, tabulated, coded and analyzed. Demographic data is will be analized by using ANOVA test test and chisquare test. Anesthetic characters will be analyzed using independent samples t – test

Incidence of complications and maximal dermatomal blockade are analysed using one – way ANOVA test.

Data is reported as a mean value +/- standard deviation. A p value of < 0.05 was considered statistically significant(S) between two groups

RESULTS

DEMOGRAPHIC PARAMETERS COMPARISSION

CHI-SQUARE TEST FOR DEMOGRAPHIC PARAMETERS

Table 3: Descriptive Statistics between 0.5 and 0.75 groups

Groups		N	Mean	Std. Deviation	Minimum	Maximum
.50	age in years	30	47.10	13.747	18	70
	ASA grade	30	1.37	.490	1	2
	weight in kgs	30	63.60	9.793	42	92
	height in	30	160.90	6.375	150	170
.75	age in years	30	41.13	11.196	23	60
	ASA grade	30	1.37	.490	1	2
	weight in kgs	30	65.10	10.310	33	88
	height in	30	161.53	6.107	150	170

Table 4: Test Statistics of group 0.5 and group 0.75 groups

Groups		age in years	ASA grade	weight in kgs	height in cms
.50	Chi-Square	10.600[a]	2.133[b]	11.933[c]	14.000[d]
	Df	20	1	16	10
	Asymp. Sig.	.956	.144	.749	.173
.75	Chi-Square	8.667[e]	2.133[b]	24.133[f]	17.200[g]
	Df	19	1	13	11
	Asymp. Sig.	.979	.144	.080	.102

a. 21 cells (100.0%) have expected frequencies less than 5. The minimum expected cell frequency is 1.4.
b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 15.0.
c. 17 cells (100.0%) have expected frequencies less than 5. The minimum expected cell frequency is 1.8.
d. 11 cells (100.0%) have expected frequencies less than 5. The minimum expected cell frequency is 2.7.
e. 20 cells (100.0%) have expected frequencies less than 5. The minimum expected cell frequency is 1.5.
f. 14 cells (100.0%) have expected frequencies less than 5. The minimum expected cell frequency is 2.1.
g. 12 cells (100.0%) have expected frequencies less than 5. The minimum expected cell frequency is 2.5.

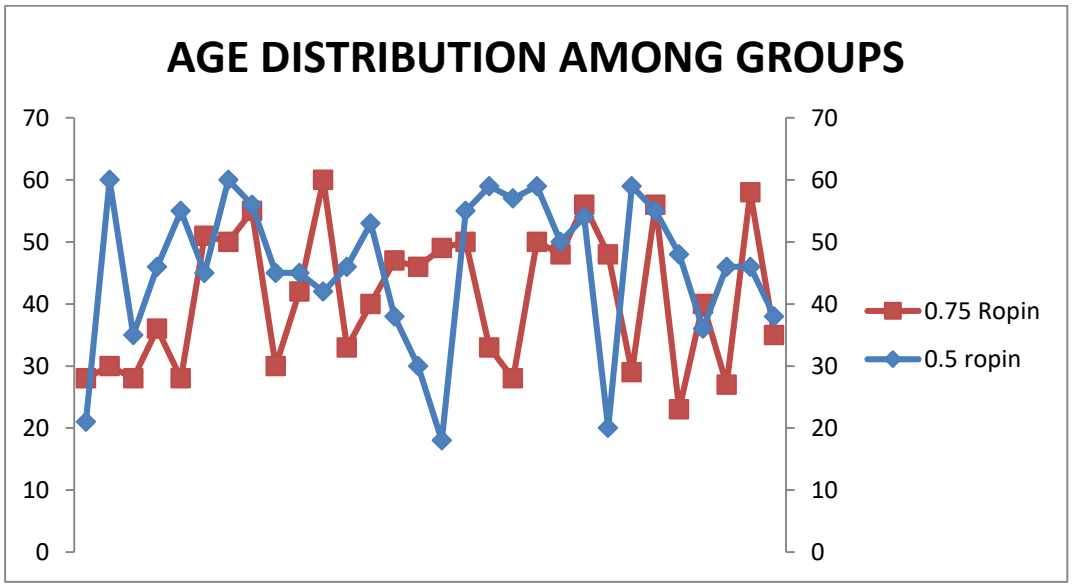
ANOVA Test For Demographic Data						
		Sum of Squares	Df	Mean Square	F	Sig.
age in years	Between Groups	534.017	1	534.017	3.398	.070
	Within Groups	9116.167	58	157.175		
	Total	9650.183	59			
ASA grade	Between Groups	.000	1	.000	.000	1.000
	Within Groups	13.933	58	.240		
	Total	13.933	59			
weight in kgs	Between Groups	33.750	1	33.750	.334	.566
	Within Groups	5863.900	58	101.102		
	Total	5897.650	59			
height in cms	Between Groups	6.017	1	6.017	.154	.696
	Within Groups	2260.167	58	38.968		
	Total	2266.183	59			

Table 5: ANOVA test for demographic parameters

Conclusion: Above charts signifies no difference between two groups regarding demographic parameters

AGE DISTRIBUTION AMONG GROUPS

Fig5 :Age distribution

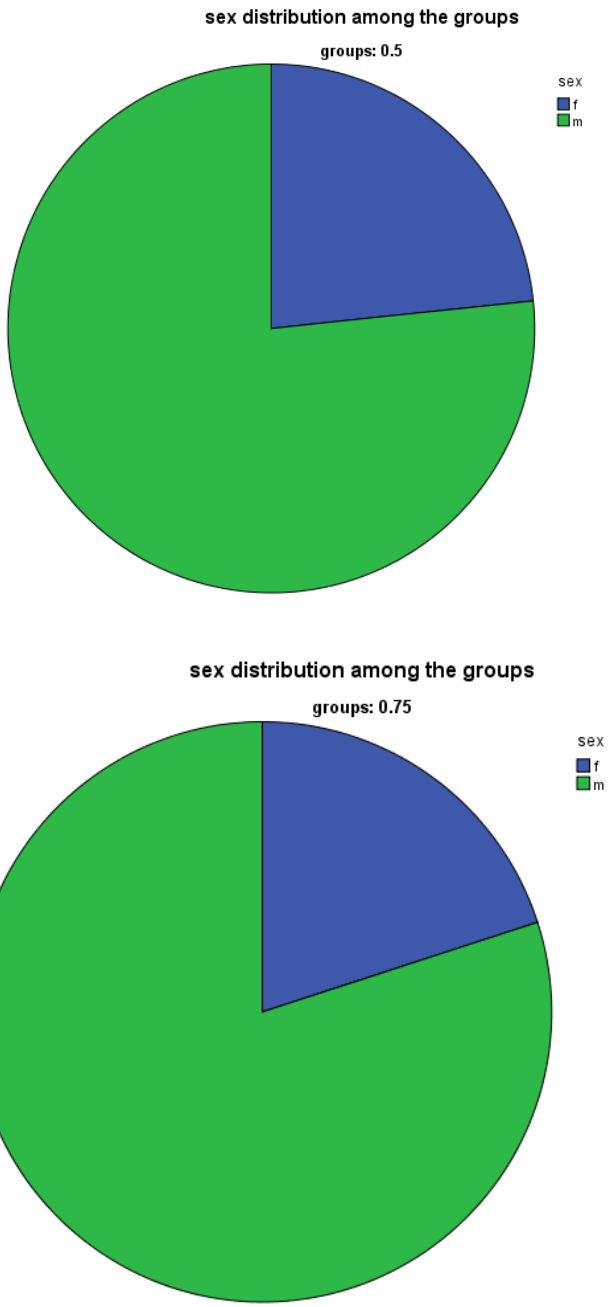


There is no significicant difference between two groups with regarding to age. Following shows mean and st deviation of age in both groups

Group 0.5[group A] -------47.10+/-13.747 yrs
Group 0.75[group B]----- 41.13+/-11.196 yrs
With significance value of **0.70** between 2 groups in ANOVA test and Suggests no significant difference between two populations regarding age.

SEX DISTRIBUTION

Fig 6 sex distribution



And no significance difference between two groups with regards to sex

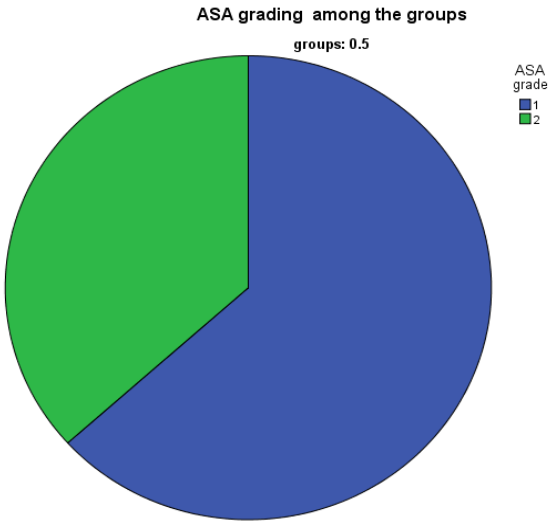
Group	Males+females	% Male	% Females
0.5	23+7=30	76.66%	23.33%
0.75	24+6=30	80%	20%

table 6. Sex distribution

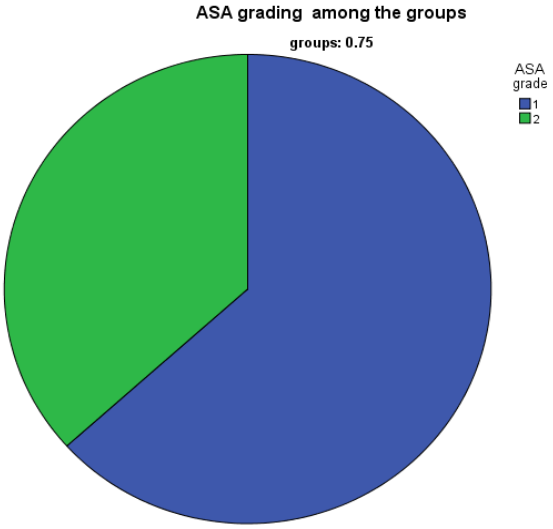
ASA GRADE COMPARISSION AMONG GROUPS

Fig 7:ASA grading

ASA grading in 0.5 Group



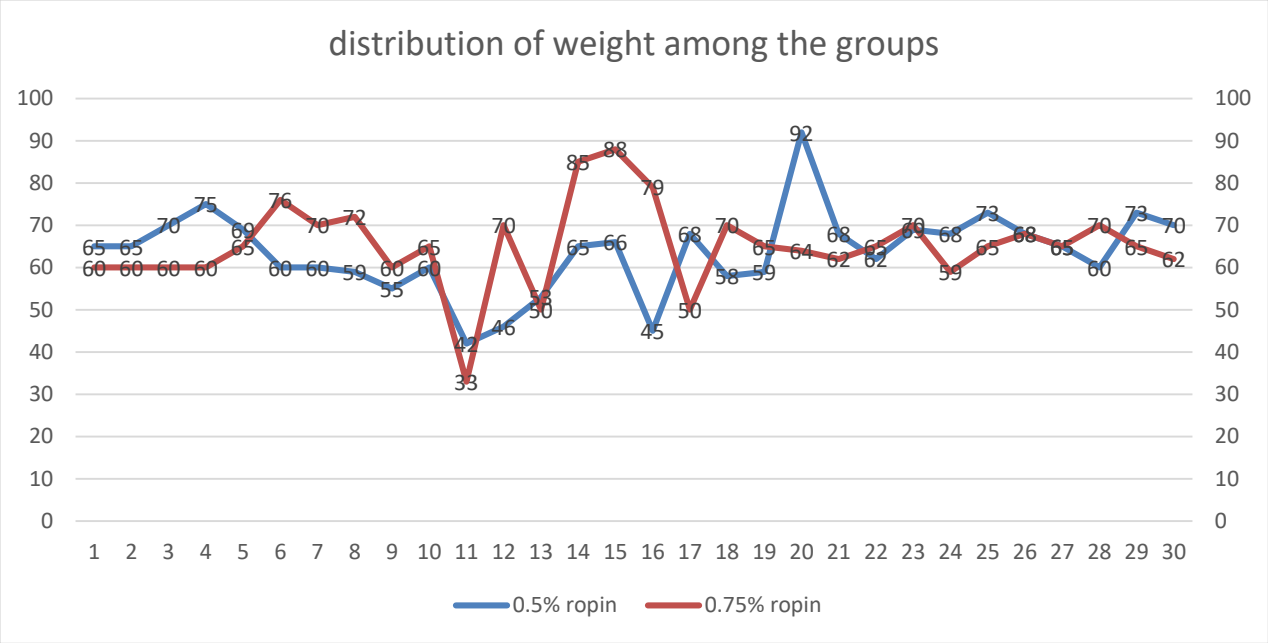
ASA grading in group 0.75



ASA grading with **p value 1** which signifies no difference in groups
0.5 group[group A]------ 1.37+/-0.490 [63.3% ASA gr 1 and 36.66 grade 2]
0.75 group [group B]---- 1.37+/-0.490[63.3% ASA gr 1 and 36.66 grade 2]
And no difference among groups

Weight comparison between two groups

fig 8: weight comparission



Weight cmparision between 2 groups were with mean and st deviation

Group 0.5 [Group A] ----------63.60+/-9.793 kgs

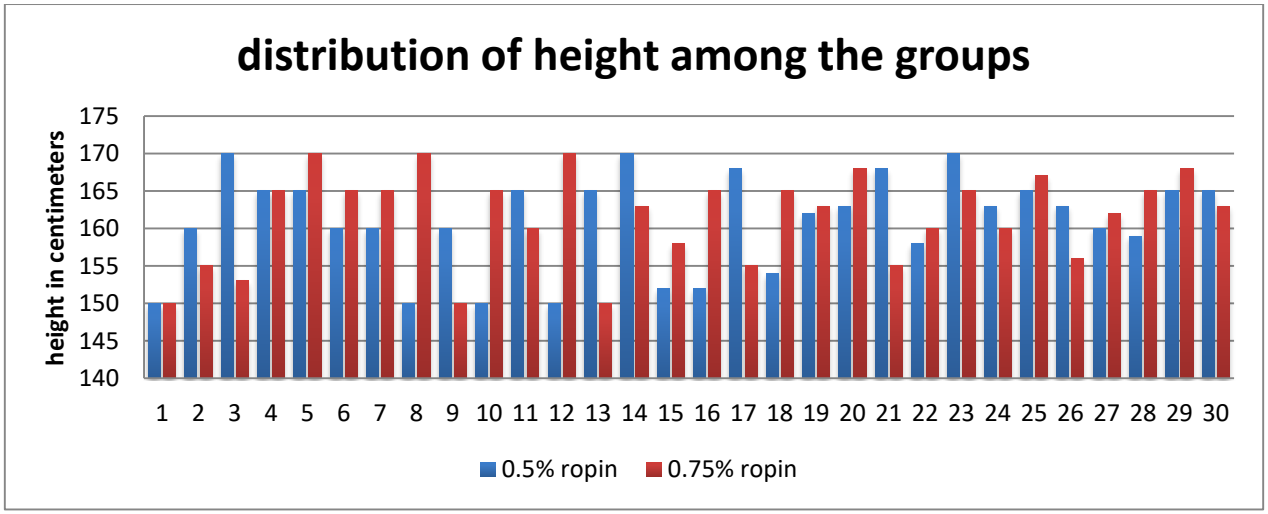
Group 0.75[Group B]----------65.10+/-10.310 kgs

With ANOVA test significant value **0.566**

With shows **no statistical difference** between 2 groups

HEIGHT COMPARISSION BETWEEN TWO GROUPS

Fig 9 height comparission



Height comparission between two groups with significant value **0.696**

0.5 group[group A]----------160.90+/-6.375 cms

Group B[group 0.75]---------161.53+/-6.107 cms

And **no significant difference** between two populations

SENSORY PARAMETERS COMPARISSION BETWEEN TWO GROUPS

1) Comparison of sensory block onset time

[time taken to achieve sensory blockade at T10 level after giving spinal anaesthesia]

Onset of sensory block between 2 groups was **significant** with

p value< 0.000

0.5group[group A] ----------3.73+/-1.173 min…

0.75 group[group B]----------2.47+/-0.507 min…

exceptionally1 patient developed delay in onset in group 0.5%

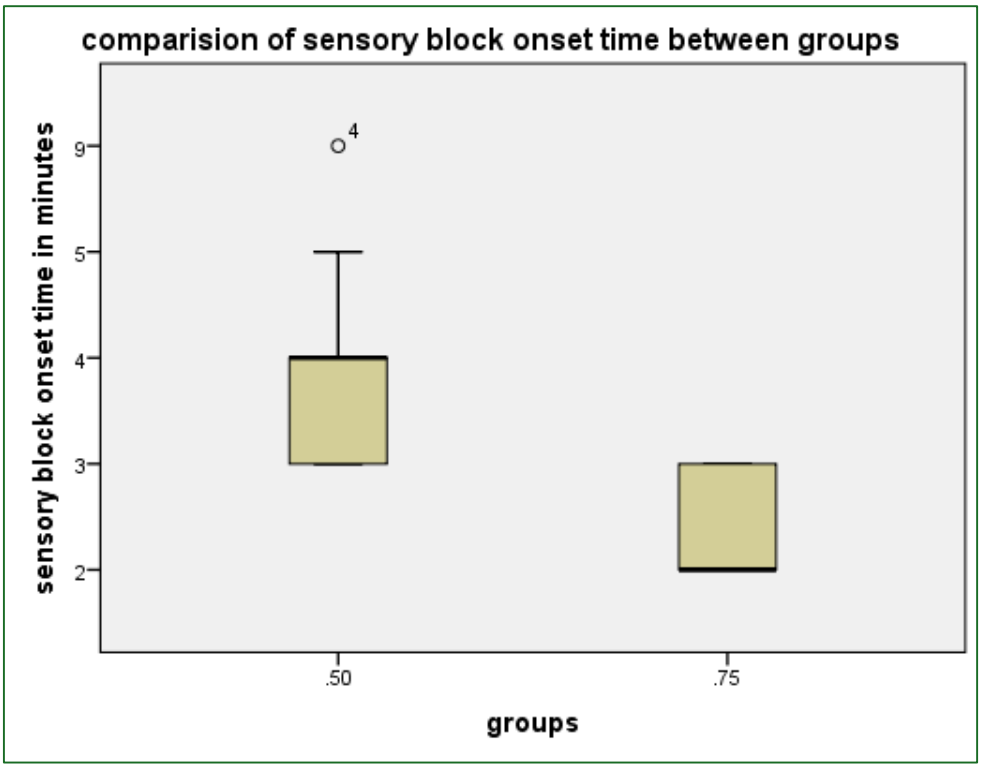


Fig10 sensory block onset time

2)Maximum dermatomes blockade

Table 7: maximal no of dermatomes blocked

ANOVA Test For Maximum Dermatome Achieved						
		Sum of Squares	df	Mean Square	F	Sig.
max dermatomes blocked	Between Groups	5.400	1	5.400	11.054	.002
	Within Groups	28.333	58	.489		
	Total	33.733	59			

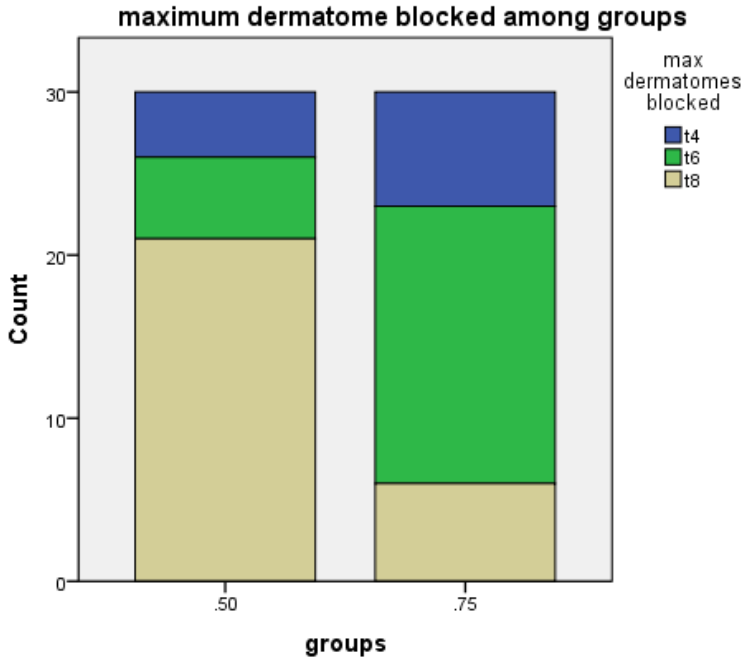


fig11.maximum level of dermatomes blocked

Maximum sensory dermatomes blocked was having statistical significant with p value **0.002** between 2 groups

Highest level of sensory block achieved was T4 in both groups,but majority of 0.75 group attained T6 dermatomal blockade and in group 0.5 its T8 With significance

Group	T4 blockade	T6 blockade	T8 blockade
0.5	13.3%[4 pts]	16.6%[5 pts]	**70%[21 pts]**
0.75	23.3%[7 pts]	**56.66%[17 pts]**	20%[6 pts]

3]COMPARISSION OF TIME TAKEN FOR MAXIMUM DERMATOMAL BLOCKADE

Time taken for blockade of maximum dermatomes were **statsticlly significant** with **p value < 0.000**
Avg time taken for max dermatomal blockade mean+/- sd
In group 0.5[Group A]---------- 18.57+/-3.104 min
In group 0.75 [Group B] ----------14.40+/-2.513 min

In some patients in group 0.75 onset is too early within 10min

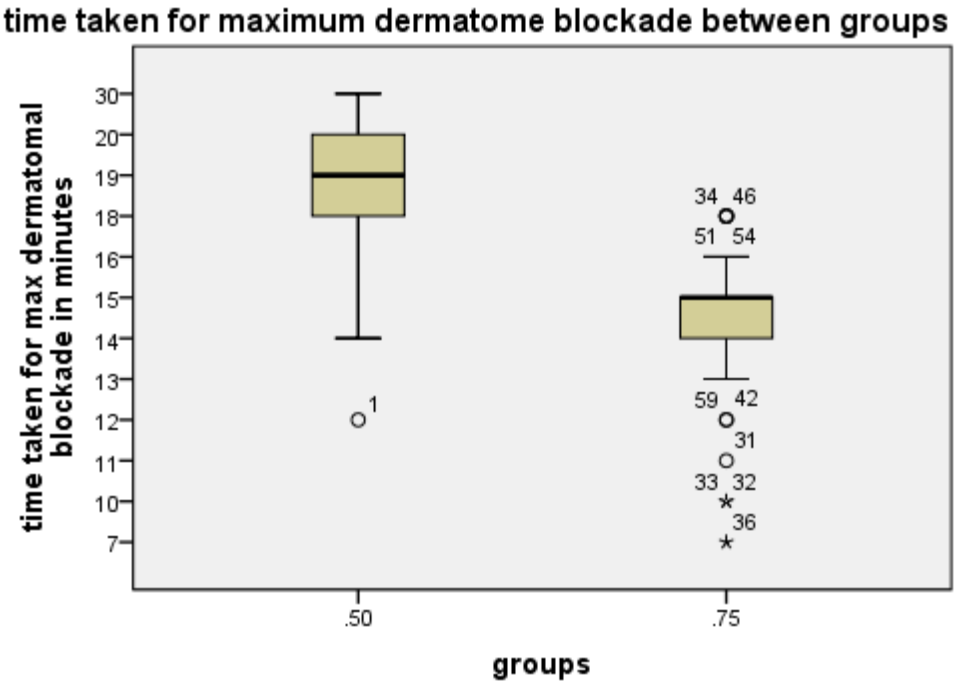


Fig 12: time taken for maximal dermatomal blockade

4]COMPARISSION OF REGRESSION OF SENSORY BLOCK REGRESSION TO T12 LEVEL[time at t 10 level]

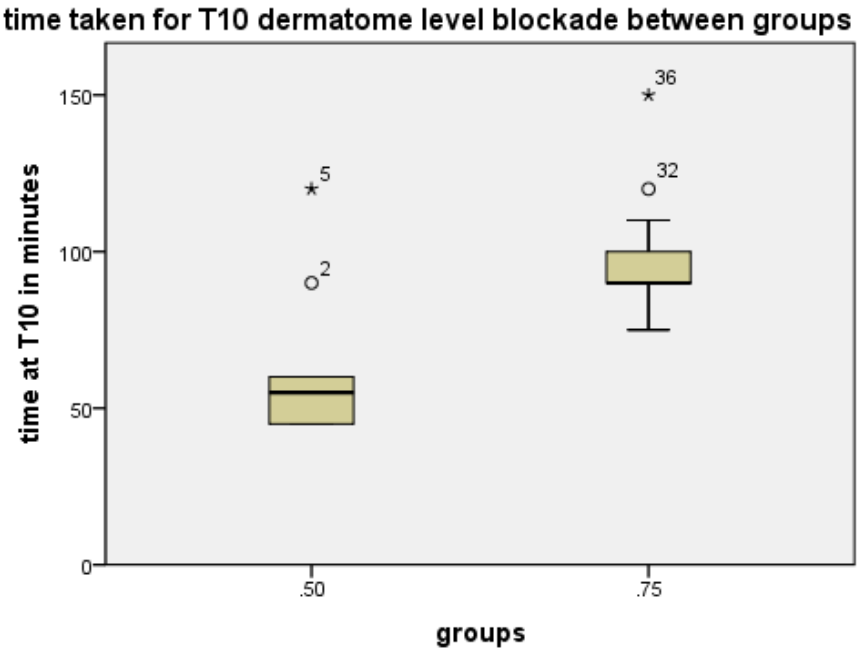
[time taken for regression of blockfrom onset of block to regression to T12]

Was statastically significant in between two groups with of p value <0.000

In group A [0.50]---------- 56.20+/-15.009 min

In group B [0.75] ----------94+/-14.408 min

Fig:13 duration at T10 dermatomal level



5]TOTAL DURATION OF SENSORYBLOCKADE

[time from onset of sensory blockade to first request of analgesic]

Total duration of sensory blockade was stastastically significant between 2 groups with p value **<0.000**

In group 0.5 [group A] ----------133.10+/-15.537 min

In group 0.75 [group B] ----------180+/-10.986 min

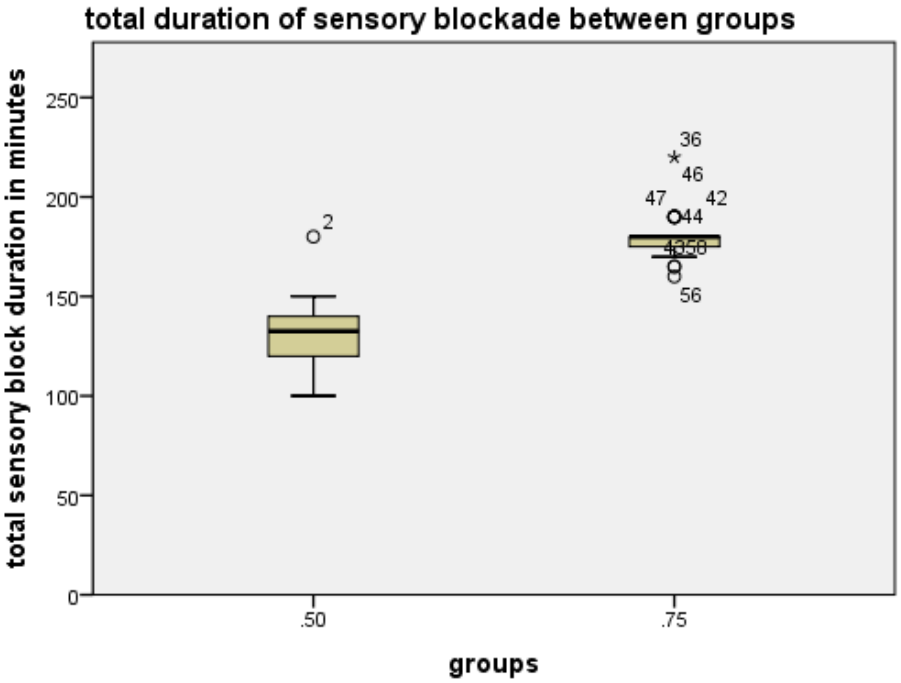
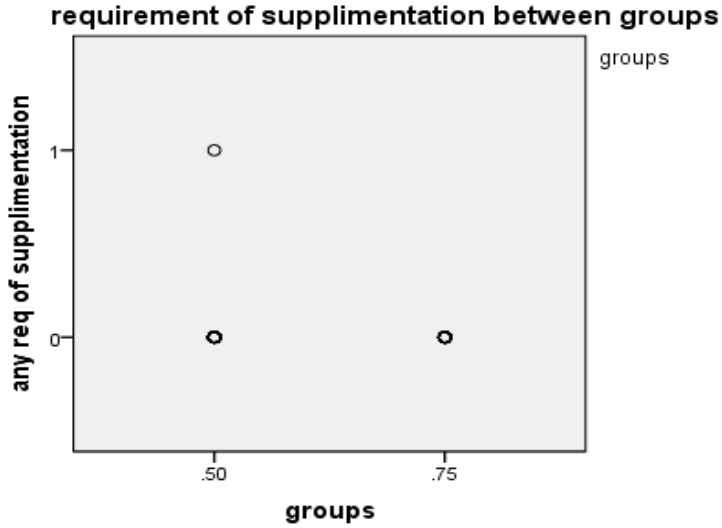


Fig 14: total duration of sensory blockade

6] ANALGESIC REQUIREMENT COMPARISSION

One patient in Group 0.50 required analgesia supplementation and none in group 0.75 group. That is <5% of group A population requiring analgesic suppplimenttion during surgery[only 3.3%] which is **statistically not significant**

Fig 15. analgesic supplimentation



Motor block assesment parametrs

1]COMPARISSION OF ONSET OFMOTOR BLOCK [onset of gr 1 block]

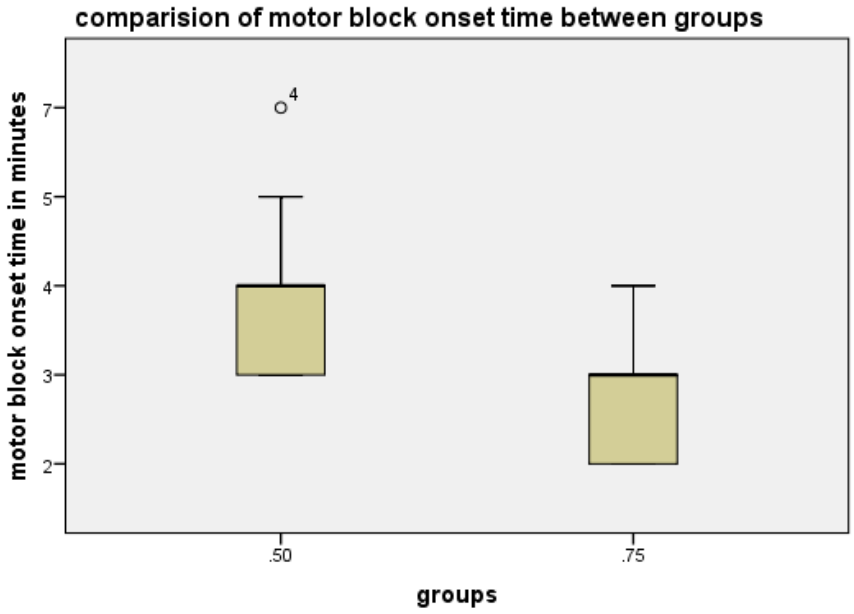
Motor blockade onset between 2 groups were statastically significant with p value **0.000**.onset is early in group 0.75

Mean onset of motor blockade in Group 0.5[groupA]--------3.70+/-0.915 min

Group 0.75[group B]-----2.60+/-0.621 min

Exceptional delay in onset in 1 patient in group 0.5[groupA]

Fig 16.motor block onset time

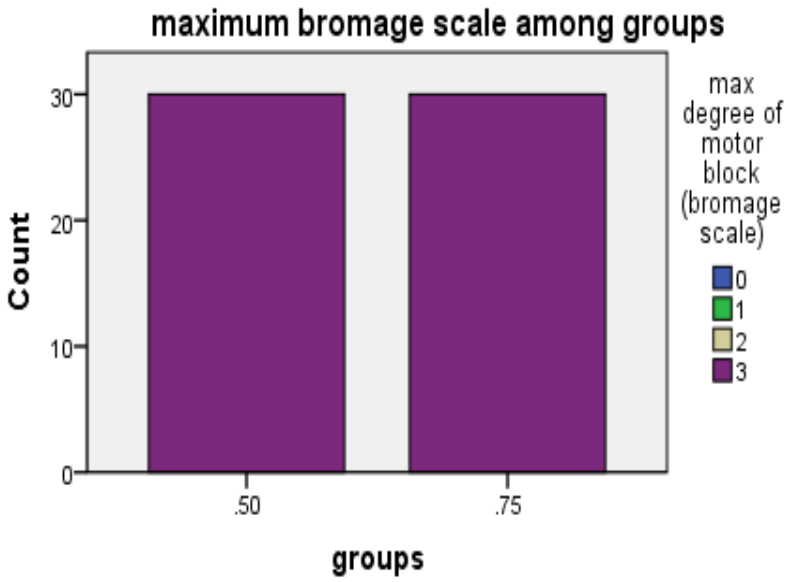


2] Degree of maximal motor blockade achieved

Its same in both groups with no significance p value 1.0

All patients in study belonging to both groups were obtained Gr3 motor blockade with difference in time of onset of blockade

Fig 17: maximal degree of motor blockade



3]Time taken for maximal motor block onset time

Time taken for motor block onset between two groups were statistically **significant with p value of <0.000**

In Group 0.50 [group A] ----------17.77+/-3.390min

In Group 0.75[group B] ----------13.37+/-2.810 min

Its significantly early in onset in Group B [Group 0.75]

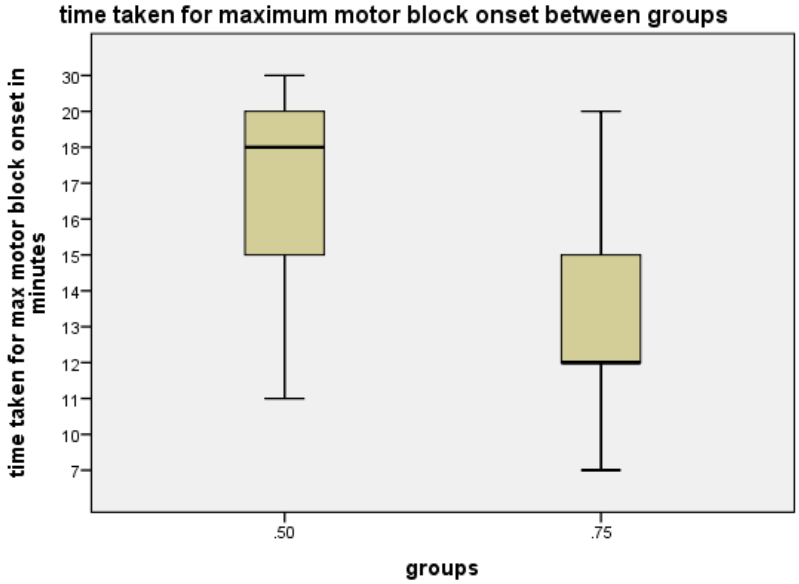


Fig 18: time of onset of maximal motor blockade

4) Comparission of TOTAL duration of motor blockade

Was significant longer in Group B [Group 0.75] with t tailed significance value **0.000** which is significant between two groups.

In 0.5 Group [Group A] ----------105.50+/-12.273 min

In 0.75 Group[Group B]----------139.17+/-12.463 min

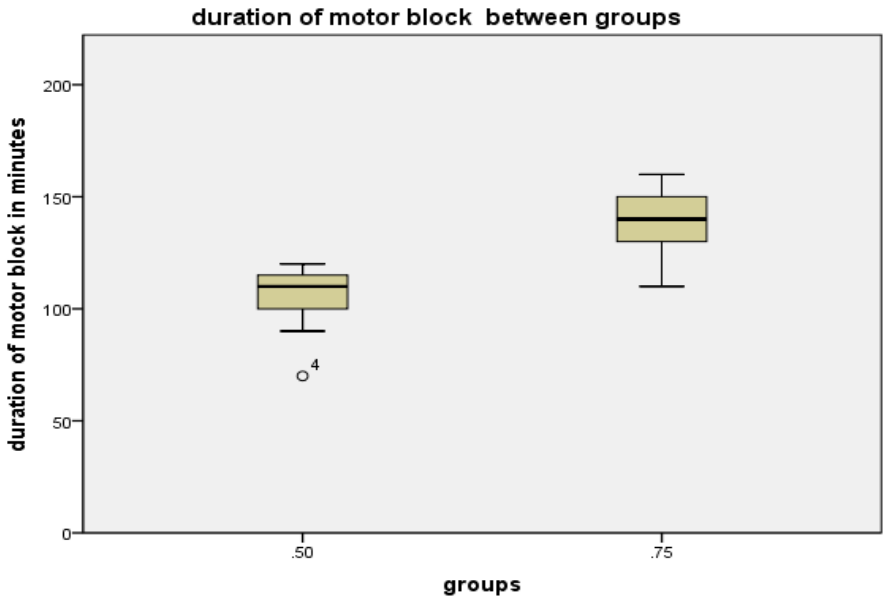


Fig 19: total duration of motor blockade

Table group statastics for anaesthesia parameters

GROUP STATISTICS FOR ANAESTHETIC PARAMETERS					
	groups	N	Mean	Std. Deviation	Std. Error Mean
sensory block onset time in minutes	.50	30	3.73	1.172	.214
	.75	30	2.47	.507	.093
motor block onset time in minutes	.50	30	3.70	.915	.167
	.75	30	2.60	.621	.113
time taken for max dermatomal blockade in minutes	.50	30	18.57	3.104	.567
	.75	30	14.40	2.513	.459
time at T10 in minutes	.50	30	56.20	15.009	2.740
	.75	30	94.00	14.468	2.641
total sensory block duration in minutes	.50	30	133.10	15.537	2.837
	.75	30	180.00	10.986	2.006
time taken for max motor block onset in minutes	.50	30	17.77	3.390	.619
	.75	30	13.37	2.810	.513
duration of motor block in minutes	.50	30	105.50	12.272	2.241
	.75	30	139.17	12.463	2.275

Table 7: group statastics of anaesthetic parameters

Table.8: Independent sample test for anaesthetic parameters

Independent Samples Test For Anaethetic Parameters										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
sensory block onset time in minutes	Equal variances assumed	2.031	.159	5.430	58	.000	1.267	.233	.800	1.734
	Equal variances not assumed			5.430	39.495	.000	1.267	.233	.795	1.738
motor block onset time in minutes	Equal variances assumed	1.497	.226	5.446	58	.000	1.100	.202	.696	1.504
	Equal variances not assumed			5.446	51.049	.000	1.100	.202	.694	1.506
time taken for max dermatomal blockade in minutes	Equal variances assumed	.196	.659	5.714	58	.000	4.167	.729	2.707	5.626
	Equal variances not assumed			5.714	55.597	.000	4.167	.729	2.706	5.628
Sensory regression time to T 12 minutes	Equal variances assumed	.113	.738	-9.932	58	.000	-37.800	3.806	-45.419	-30.181
	Equal variances not assumed			-9.932	57.922	.000	-37.800	3.806	-45.419	-30.181
total sensory block duration in minutes	Equal variances assumed	3.125	.082	-13.500	58	.000	-46.900	3.474	-53.854	-39.946
	Equal variances not assumed			-13.500	52.199	.000	-46.900	3.474	-53.871	-39.929
time taken for max motor block onset in minutes	Equal variances assumed	.030	.862	5.473	58	.000	4.400	.804	2.791	6.009
	Equal variances not assumed			5.473	56.067	.000	4.400	.804	2.790	6.010
duration of motor block in minutes	Equal variances assumed	.010	.920	-10.543	58	.000	-33.667	3.193	-40.059	-27.275
	Equal			-	57.9	.000	-	3.193	-40.059	-27.275

	variances not assumed			10.543	86		33.667			

COMPLICATIONS

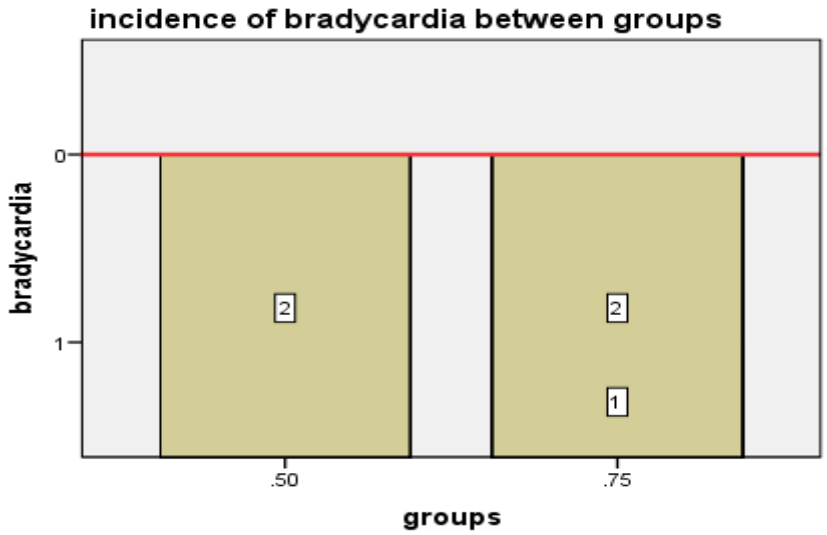
1) INCIDENCE OF BRADYCARDIA

2 patients in both group were developed bradycardia[HR<60] with **p value 1.0** which is not statistically significant between two groups

Table9: bradycardia comparission

Group	No.of patients developed bradycardia	Percentage of incidence of bradycardia	Significance
0.5[A]	2	6.6%	P value 1.0
0.75[B]	2	6.6%	

Fig 20 incidence of bradycardia



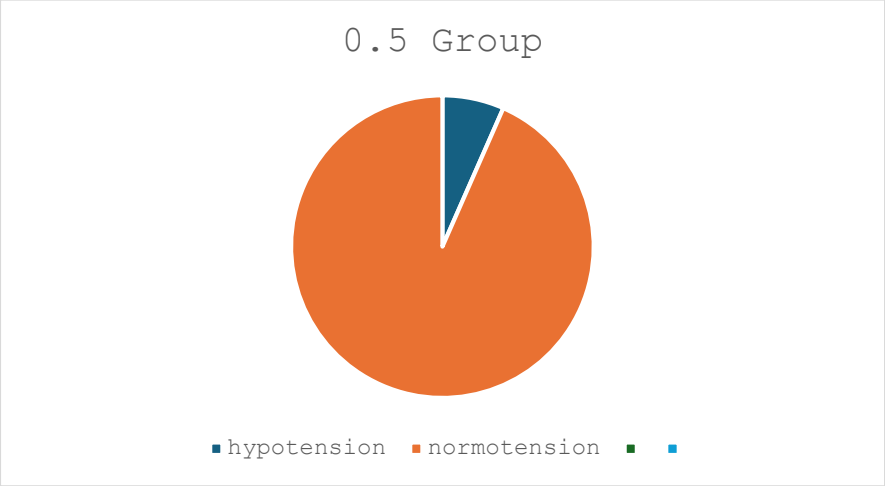
2) Incidence of hypotension

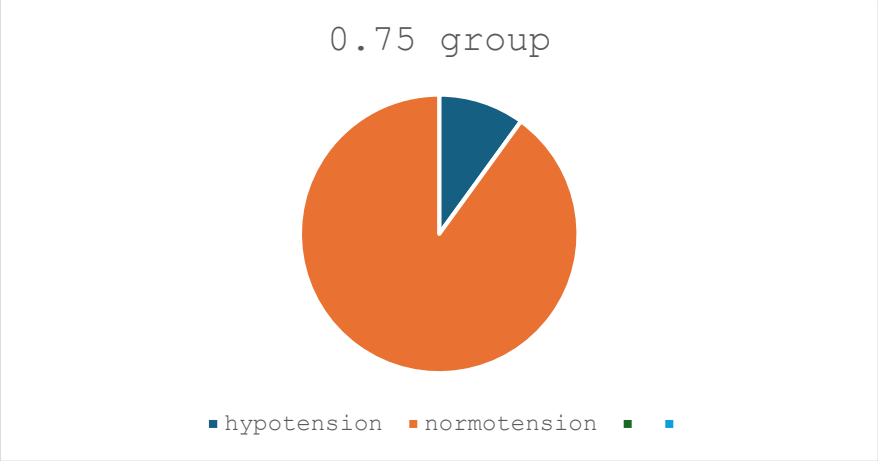
Table10: comparission of hypotension

Group	No.of pt developed hypotension	% of incidence
0.5	**2**	**6.6%**
0.75	**3**	**10%**

No statistical significance between two groups [difference is less than 5% between two groups]

Fig 21: hypotension comparision





3] Incidence of shivering

Table 11: comparision of shivering

GROUP	No of patients	Percentage
0.5	5	16.5%
0.75	8	24%

Shivering is most common complication in both the groups and its incidence is more in group B[0.75] with statistical significance **p value 0.001**

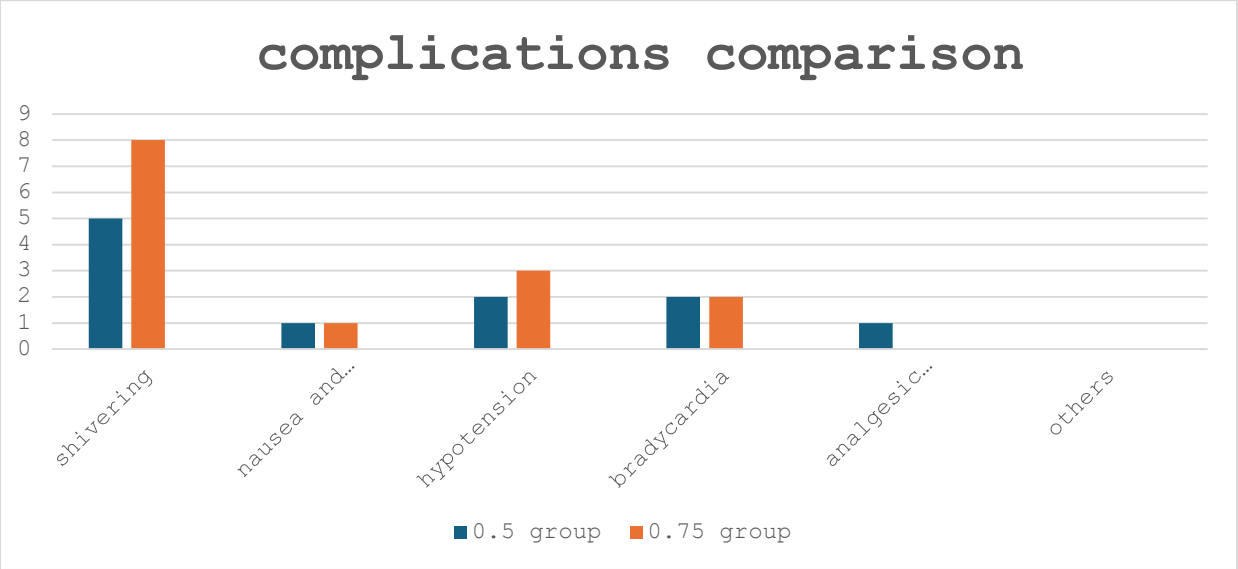
4] Nausea and Vomitings

There is no statistical significance between two groups **p value 1**

Table 12: comparision of Nausea and Vomiting

GROUP	No. of patients	% of incidence
Group A [0.5]	1	3.33%
Group B [0.75]	1	3.33%

Fig 22: comparison of all complications



Results

Ropivacaine is a new long-acting, enantiomerically pure (S-enantiomer), amide local anaesthetic with a high pKa and low lipid solubility. It is considered to block sensory nerves to a greater degree than motor nerves. Because of sensorimotor dissociation ropivacaine should be a favorable local anesthetic for day-case surgery, and could be associated with earlier postoperative mobilization than bupivacaine.

This was nonblinded randomized study was conducted to compare two different concentrations[0.5% vs 0.75%] of intrathecal ropivacaine lower limb surgeries. The patients were selected at random, to avoid any kind of bias and to allow comparability of results obtained.

Patient characteristics across the groups:

The patients studied across the group did not vary much with respect to age, sex ,height, weight and ASA grading.. These parameters were kept identical in both the groups to avoid variations in the intraoperative and postoperative outcome of the patients.

Changes in the perioperative cardiovascular parameters:

Heart rate, systolic and diastolic blood pressure in both the groups did not vary significantly. Cardiovascular changes were unremarkable throughout, and similar in the two groups, as were the

volumes of fluid and administered Two patient in each group had a transient bradycardia of <60 bpm, which was treated with 0.6mg atropine and improved immediately.. Otherwise all the other patients hemodynamics were stable. BP was also stable in both the groups 2 patients in group 0.5 and 3 patients in 0.75 developed hypotension which were treated with vasopressors

Jack W van Kleef et al in 1994 found that the hemodynamic changes were of no clinical importance during a similar study.[19] Kim S Khaw et al; in 2001, found that the incidence of hypotension were similar in a comparison of different doses of plain ropivacaine [15].

John On-Nin Wong et al in 2004 , have observed the same that there are no major cardiovascular changes in the two groups receiving plain ropivacaine in different doses compared to each other.[5]

Helena Kallio et al; in 2004 observed that the groups receiving plain ropivacaine did not have any differences in the hemodynamics after receiving different doses. [4]

From the above studies we can conclude that use of 15 mg or 22.5mg of Ropivacaine intrathecally causes no gross hemodynamic disturbances

Changes in the onset of sensory and motor blockade

In the present study the onset of sensory blockade in group-0.50[group A] was 3.73+/-1.172 min compared to 2.47 ± 0.507 min in group-0.75[group B] which was statistically highly significant (P< 0.000)

Similarly the onset of motor blockade in group-0.5[group A] was 3.70± 0.915 min compared to 2.60 ± 0.621 min in group-0.75[GROUP B] which was also statistically highly significant (P< 0.001)

The median time to reach the highest level of analgesia was also statistically significant between two groups with p value <0.000 in group 0.50 [group A] its 18.57+/- 3.104 sec and in group 0.75 [group B] is 14.40+/-2.513

However, the analgesic spread was extremely variable with both solutions, sometimes being restricted to the lumbosacral segments, sometimes extending to the upper thoracic segments. glucose-free ropivacaine 0.5% and 0.75% solutions (baricities at 37°C: 0.9980 and 0.9988, respectively) will behave as slightly hypobaric solutions. Consequently, injection of glucose-free ropivacaine solutions may result in a higher spread of analgesia when the patient is kept in the sitting position for at least 2 min after the injection

Ying Y. Lee et al: in 2007 found that the onset of motor blockade was more reliable with the 0.75% ropivacaine[16,] John on-nin wong et al, in 2004, opined that the onset of sensory and motor block were similar in two groups of ropivacaine 0.75%, but different doses.[5]

Time for regression of sensory level:

In the present study, the two segment regression of sensory level to T12 dermatome

In group-0.50 [group A]was 56.20±15.009 minutes compared to 94.0±14.408 minutes in group-0.75 [group B]which was statistically highly significant (P<0.000).

Jack W van Kleef et al in 1994, found that the duration of analgesia at the level of T10 was significantly longer in the 0.75% group as compared to 0.5% group. . This shows that ropivacine 0.75% has a more reliable duration of analgesia.[19]

Intensity and duration of motor blockade

In the present study, onset and duration and time taken for gr3 block in both groups were statistically significant

Onset TIME in group 0.50 [GROUP A] 3.70+/-0.915 min and in group B 2.60+/-0.621min.

The duration of motor blockade in group-A [0.5 GROUP]was 105.50±12.272minutes compared to 139.17+/-12.468 minutes in group-B[0.75 GROUP] which was statistically highly significant (P<0.000). ONSET time OF maximal motor blockade was statistically significant in between two groups..in group 0.5 [groupA] its 17.77+/-3.390min and in group 0.75[GROUP B] ITS 13.37+/-2.810

In both groups maximal motor blockade was obtained with different period of onset and duration of motor blockade.

Van Kleef, Jack W et al in 1994 observed that the greater propensity to produce a complete motor block, and the longer duration of analgesia and motor block produced by the 0.75% ropivacaine solution, should be suitable for orthopedic and vascular surgical procedures of intermediate duration, requiring an intense motor
block.[19]

On the other hand, the 0.5% ropivacaine solution with its shorter duration of analgesia and often relatively moderate motor block of the lower limbs could be useful for transurethral procedures or minor orthopedic surgery, where the degree of motor block is not of critical importance.

Helena Kallio et al in 2004, studied the effects of plain ropivacaine 20mg and 15mg. They found that there was a significantly longer duration of motor block with 20mg than 15 mg of ropivacaine.[4]
H.Kallio et al,in 2004, in another study comparing hyperbaric ropivacaine with plain ropivacaine found that plain ropivacaine has a longer duration of motor block than hyperbaric solution[4]

Time of first request of analgesics [total duration of sensory blockade]

In the present study, the time of first request of analgesics in group-0.5[group A] was 133.10±15.537 minutes compared to 180±10.986 minutes in group-0.75[GROUP B] which was statistically highly significant (P<0.000).

Jack W. van Kleef et al, in 1994, found that the time of first request for analgesia was significantly longer in the 0.75% group as compared to 0.5% group. This shows that there was significantly longer period of analgesia with 0.75%Ropivacaine [19]

Adverse Effects:

Shivering was most common complications in both the groups Bradycardaia incidence was sane in both the groups

Nausea and vomiting seen in very few cases

John On-nin Wonget al in 2004 found that the incidence of shivering was more in the group receiving 33.75mg plain ropivacaine than the group receiving 26.25% of plain ropivacaine.[5]

Thus there were no major differences in the adverse effects of both drugs.

Conclusion

Intrathecal administration of 22.5mg of 0.75% isobaric Ropivacaine produces better quality of analgesia and motor block with negligible hemodynamic disturbances as compared to 15mg of isobaric 0.5% ropivacaine in lower limb surgeries.

Advantages are:

Superior quality of analgesia. Longer duration of analgesia. (133 min vs 180 min)
Better motor block onset time
Reduced post-operative analgesic requirements.
Minimal side effects.

Summary

The study was conducted to compare the effect of intrathecal isobaric Ropivacaine 0.5% and isobaric Ropivacaine 0.75% in lower limb surgeries.

60 patients belonging to American Society of Anesthesiologists (ASA) classification I and II, aged between 18-60 years, posted for elective lower limb surgeries were randomly allocated for the study in a non-blind manner.

Group-A [0.50]: 30 patients received 3ml of intrathecal isobaric Ropivacaine 0.5% (15mg)
Group-B [0.75]: 30 patients received 3ml of intrathecal isobaric Ropivacaine 0.75% (22.5mg)

The patients studied across the group did not vary much with respect to age, sex or height.

The onset of sensory blockade was delayed by about 60-90 seconds in group-A [0.5] and the onset of motor blockade was delayed by about 60-90 seconds in group-A [0.5] compared to Group-B [0.75].
The time for two dermatomal segments regression of sensory level was prolonged in Group-B compared to group-A and also time for regression of sensory level to T10 dermatome was prolonged in Group-B compared to group-A thus increasing the duration of analgesia.

The time of first request of analgesics by the patients in Group-B is prolonged compared to group-A thus prolonging the duration of analgesia.

The adverse effects observed in the study were minimal. With the present study we can summarize that 3ml of intrathecal isobaric ropivacaine 0.75% (22.5mg) brings about better quality and longer duration of analgesia, reliable quality of motor block, better postoperative outcome with minimum side effects than 0.5% ropivacaine. (15mg)