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A Comparative Study of Anaesthetic & Haemodynamic Effects of Intrathecal Dexmedetomidine & Clonidine as Adjuvants To 0.5% Hyperbaric Bupivacaine.

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Abstract:
Introduction:*Alpha 2 adrenergic agonists such as Dexmedetomidine & Clonidine are used as adjuvants for achieving multiple benefits in Spinal anaesthesia.Dexmedetomidine which is a new alpha 2 agonist has alpha 2: alpha 1 selectivity of eight times higher selectivity more than clonidine.Hence the present study was undertaken to compare Dexmedetomidine & Clonidine for use with intrathecal hyberbaric Bupivacaine.*
Results:*In the present study it was noted that Dexmedetomidine 5µg when added to 12.5mg 0.5% hyberbaric bupivacaine had a faster onset of motor blockade and a longer duration of sensory blockade,motor blockade and a longer duration of analgesia when compared to Clonidine 30µg when added to 12.5mg 0.5% hyperbaric Bupivacaine.*
Conclusion:*Thus from the present study it is proved that Dexmedetomidine a new alpha 2 agonist significantly prolongs the duration of 0.5% hyberbaric Bupivacaine when compared with Clonidine.*
Key Words: *Dexmedetomodine, Clonidine, Intrathecal hyberbaric 0.5% Bupivacaine.*

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I. Introduction

Spinal anaesthesia is one of the most popular techniques for both elective and emergency surgical procedures; particularly caesarean sections, lower abdominal surgeries, orthopedic and urological surgeries

Alpha 2 (α_2) -adrenergic agonist's such as Clonidine[1,2] and Dexmedetomidine[3,4] are commonly used as adjuvants to achieve multiple benefits for spinal anaesthesia.Dexmedetomidine is new, highly selective α_2 adrenoceptor agonist whose α_2:α_1 selectivity is eight times higher than that of clonidine[5]. Therefore there has been a growing interest in the potential use for this drug as an adjunct to intrathecal bupivacaine.

Dexmedetomidine 5 µg or clonidine 30 µg would be equipotent and would produce a similar effect on the characteristics of bupivacaine spinal anesthesia[6]. The purpose of this study is to compare the onset and duration of sensory and motor block, as well as the hemodynamic changes and level of sedation, following intrathecal bupivacaine supplemented with a low dose of either dexmedetomidine or clonidine

AIMS AND OBJECTIVES

The objective of the present study is to evaluate and compare the anaesthetic and hemodynamic effects of intrathecally administered dexmedetomidine and clonidine, as adjuvants to 0.5% hyperbaric bupivacaine, subarachnoid block. The study aims to compare the following two groups of 40 patients each:
Group "BC" Clonidine group: Receiving 12.5 mg of 0.5% hyperbaric bupivacaine (2.5 ml) +
30 µg clonidine in 0.5 ml of normal saline intrathecally (Total volume of 3 ml).
Group "BD" Dexmedetomidine group: Receiving 12.5 mg of 0.5% hyperbaric bupivacaine

(2.5 ml) + 5 µg dexmedetomidine in 0.5 ml of normal saline intrathecally (Total volume of 3 ml)
The following factors will be compared between the two groups:

1. Sensory and motor blockade - Onset, time to peak sensory blockade, highest level of sensory block, and duration of surgical sensory block.
2. Recovery parameters-Time to regression of sensory blockade to T 12 dermatome, and time to complete motor recovery.
3. Analgesia - Duration of complete and effective analgesia, and time to first pain medication.
4. Hemodynamic Changes, Level of Sedation, and Complications.

II. Methodology

This clinical study was conducted on 80 adult patients of either sex, belonging to ASA physical status 1 & 2, aged 18 to 55 years, who were posted for elective lower limb, lower abdominal, gynecological and urological surgeries under spinal anaesthesia. The study was conducted in the Department of Anaesthesia and Critical Care, Guntur Medical College, Guntur, after obtaining approval by the institutional ethical committee and after obtaining informed consent. It was conducted over a period of 12 months. Patients were randomly divided into two groups of 40 each.

Group "BC" Clonidine group - Receiving Intrathecal Bupivacaine 12.5mg (2.5mL) + 30 µg clonidine in 0.5mL normal saline (Total 3mL)

Group "BD" Dexmedetomidine group -Receiving Intrathecal Bupivacaine 12.5mg (2.5mL) + 5 µg dexmedetomidine in 0.5mL normal saline (Total 3mL)

Method of study:

Pre- anesthetic checkup was carried out pre- operatively with a detailed history, general physical examination and systemic examination. Airway assessment and spinal column examination were done.

Preoperatively:

- Patient"s informed consent was taken.
- Nil per oral (NPO) instructions were explained and all patients included in the study were kept NPO for $\geq$ 6 hours.
- The procedure of subarachnoid block was explained and the patient was informed to communicate to the Anesthesiologists about perception of any pain or discomfort during the surgery.

INTRAOPERATIVE OBSERVATIONS:

1. Vital parameters:

HR, BP and SpO2 were noted every 5 minutes till 1hour, then followed by recordings every 15 min. till the end of surgery.

2. Assessment of Sensory Blockade:

The level of sensory block was tested every 2 min and the highest level of sensory block and time required to achieve it was noted.

3. Assessment of Motor Blockade:

Motor block of the lower extremities was assessed according to the Modified Bromage Scale, every 2 min.

Modified Bromage Scale[7]:

- Grade 0 - Full flexion of knees and feet.
- Grade 1 - Just able to flex knees, full flexion of feet.
- Grade 2 - Unable to flex knees, but some flexion of feet possible.
- Grade 3 - Unable to move legs or feet.

4. Assessment of Sedation:

The level of sedation was assessed every 10 min, using the Ramsay Sedation Scoring system

5. Adverse events:

Side effects such as nausea, vomiting, hypotension, bradycardia or any other complications were recorded.

POSTOPERATIVE OBSERVATIONS:

1. Assessment of Sensory Blockade:

The duration of sensory blockade was documented by assessing the level of sensory block every 30 min, as the time from onset to the time of return of pinprick sensation to T 12 dermatomal level.

2. Assessment of Motor Blockade:

Motor block was assessed and graded at the end of surgery and then at 30 min intervals, using the Modified Bromage Scale. Time until complete return of lower extremity motor function (Score = 0) was noted.

3. Assessment of analgesia

Pain was assessed by Visual Analogue Self Rating Method at the time of each measurement; 0 = no pain, a n d 10 = worst pain .

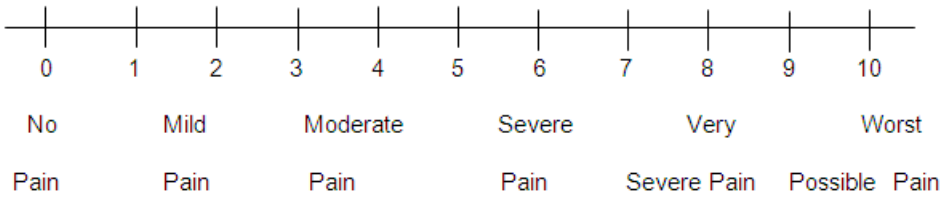

FIGURE: LINEAR VISUAL ANALOGUE SCALE

Patients were assessed for pain every 30 min after surgery until they complained of moderate pain requiring supplemental analgesia. For this study, moderate pain was defined as a VAS score of 4 or more. Duration of effective analgesia was measured as the time from intrathecal drug administration to the patient's first request for analgesic administration, recorded in minutes.

Statistical analysis

Statistical analysis was done using SPSS (Statistical Package for the Social Sciences) 21 software. The means of the continuous variables were compared between the two groups using analysis of variance ANOVA. The demographic data were analyzed using either Student's t-test or Chi- square test. . The P value of < 0.05 was considered statistically significant.

III. Results And Analysis

This study was conducted in the Department of Anaesthesiology, Guntur Medical College and Hospital,Guntur from October 2016 to september 2017. Our study comprises of 80 patients of ASA Grade I or II, of either sex, and between the age group of 18-55 years were randomly assigned to one of two groups of 40 patients each.

Group BC : Patients received 2.5ml of 0.5% hyperbaric Bupivacaine, with 30 µg Clonidine in 0.5 ml of normal saline intrathecally.

Group BD: Patients received 2.5 ml of 0.5% hyperbaric Bupivacaine, with 5 µg Dexmedetomidine in 0.5 ml of normal saline intrathecally.

The data was collected, analyzed and the results are as follows:

TABLE : TRENDS IN HEART RATE AMONG SUBJECTS

Time (min)	**Group-BC**				**Group-BD**				**BC vs. BD** *p-value*
	N	**Mean**	**SD**	***p-value***	**N**	**Mean**	**SD**	***p-value***	
Baseline	40	88.98	14.89		40	89.25	14.22		*0.83646*
5	40	88.70	15.09	*0.96429*	40	89.18	14.43	*0.98745*	*0.83647*
10	40	88.78	14.95	*0.99825*	40	89.30	14.43	*0.99642*	*0.81255*
15	40	88.70	14.91	*0.96429*	40	89.50	14.73	*0.84671*	*0.68465*
20	40	88.58	15.29	*0.84572*	40	89.80	14.94	*0.97633*	*0.45706*
25	40	89.03	15.96	*0.99987*	40	90.38	16.00	*0.49401*	*0.43651*
30	40	88.50	15.68	*0.58929*	40	89.85	15.60	*0.91667*	*0.42746*
35	40	88.00	15.91	*0.58099*	40	89.20	15.66	*0.99562*	*0.48529*
40	40	88.15	15.56	*0.67623*	40	88.40	16.01	*0.65737*	*0.93571*
45	40	88.45	15.67	*0.76584*	40	88.85	16.45	*0.82647*	*0.94851*
50	40	88.68	16.17	*0.92802*	40	88.40	17.12	*0.68182*	*0.93257*
55	40	87.98	15.33	*0.55743*	40	86.25	17.25	*0.19435*	*0.34810*
60	40	86.85	17.33	*0.27966*	40	84.13	16.11	*0.10949*	*0.22696*
75	40	85.28	17.90	*0.16418*	40	83.60	15.70	*0.09781*	*0.36996*
90	40	86.68	18.19	*0.26656*	40	83.88	15.38	*0.10179*	*0.22207*
105	36	85.03	18.97	*0.16256*	39	83.26	16.05	*0.09391*	*0.37757*
120	33	85.12	17.72	*0.16304*	36	83.64	16.32	*0.10306*	*0.45706*
135	28	86.00	18.87	*0.22696*	31	83.84	14.59	*0.10496*	*0.33401*
150	25	83.32	16.47	*0.11530*	26	85.08	14.22	*0.14175*	*0.40342*
165	20	85.60	17.76	*0.21236*	21	88.52	15.42	*0.89189*	*0.29307*
180	9	85.13	19.58	*0.21100*	11	87.06	14.68	*0.31309*	*0.51887*

- In Group BC, the mean baseline heart rate was 88.98 with a standard deviation of 14.89.
- In Group BD, the mean baseline heart rate was 89.25 with a standard deviation of 14.22.
- On comparing the two groups there was no statistically significant difference (p value > 0.05)

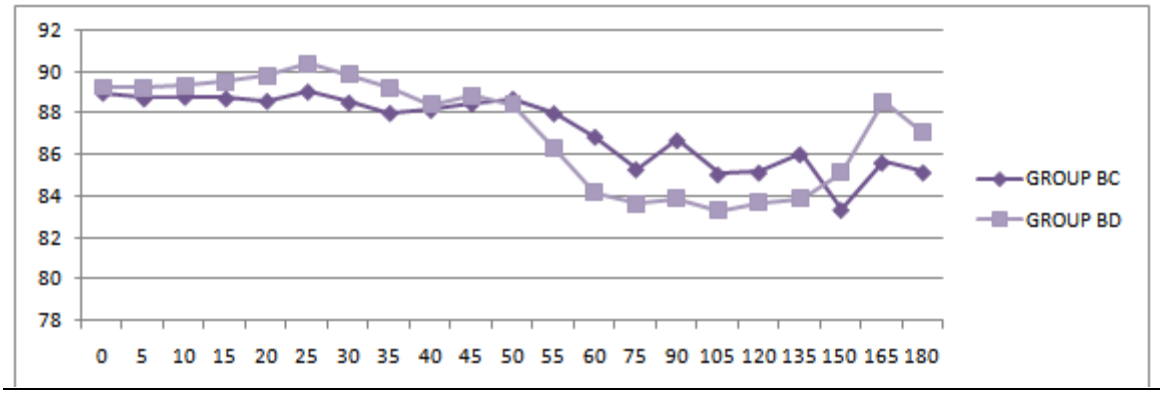

TABLE
TRENDS IN SYSTOLIC BLOOD PRESSURE AMONG SUBJECTS

	Group-BC				Group-BD				BC vs. BD
Time (min)	**N**	**Mean**	**SD**	***p-value***	**N**	**Mean**	**SD**	***p-value***	***p-value***
Baseline	40	129.20	12.73	-	40	130.40	14.15	-	0.41353
5	40	127.00	11.91	0.20677	40	130.05	13.80	0.94234	0.15595
10	40	124.95	11.66	0.10597	40	129.60	12.59	0.61798	0.09627
15	40	122.75	12.25	0.04244	40	125.10	12.66	0.09348	0.19551
20	40	120.55	12.71	0.00848	40	118.30	21.64	0.00872	0.29101
25	40	118.65	15.73	0.00783	40	116.55	18.12	0.00677	0.29783
30	40	118.35	12.68	0.00676	40	117.85	14.91	0.00668	0.91852
35	40	116.65	11.60	0.00560	40	117.65	14.24	0.00642	0.47965
40	40	115.85	11.99	0.00534	40	116.80	14.24	0.00602	0.51084
45	40	114.50	12.90	0.00503	40	116.20	14.88	0.00590	0.30221
50	40	113.05	14.87	0.00494	40	113.13	18.75	0.00555	0.98521
55	40	111.80	13.09	0.00428	40	114.60	16.14	0.00554	0.19366
60	40	107.35	12.71	0.00336	40	110.40	15.49	0.00428	0.17134
75	40	105.48	10.17	0.00280	40	106.90	15.80	0.00368	0.34519
90	40	107.18	10.98	0.00311	40	106.75	14.94	0.00355	0.82574
105	36	106.28	10.48	0.00303	39	107.28	14.21	0.00356	0.47965
120	33	107.88	9.51	0.00324	36	107.81	12.72	0.00354	0.98267
135	28	104.89	9.55	0.00302	31	108.26	9.50	0.00344	0.12159
150	25	105.60	9.27	0.00321	26	106.92	10.99	0.00360	0.35637
165	20	107.20	12.09	0.00402	21	106.38	12.94	0.00398	0.78947
180	9	105.07	9.82	0.00389	11	106.00	8.77	0.00392	0.58304

- In Group BC, the mean baseline systolic blood pressure was 129.20 with a standard deviation of 12.73. A fall in systolic blood pressure was recorded in Group BC intra- operatively, from 6 min up to 180 min, which was statistically significant (p value < 0.05).
- In Group BD, the mean baseline systolic blood pressure was 130.40 with a standard deviation of 14.15. A fall in systolic blood pressure was noted in Group BD intra- operatively, form 8 min up to 180 min, which was statistically significant (p value < 0.05).
- On comparing the two groups, the fall in systolic blood pressure was not statistically significant (p value > 0.05).

TABLE : TRENDS IN DIASTOLIC BLOOD PRESSURE AMONG SUBJECTS

	Group-BC				Group-BD				BC vs. BD
Time (min)	**N**	**Mean**	**SD**	***p-value***	**N**	**Mean**	**SD**	***p-value***	***p-value***
Baseline	40	85.05	7.63		40	83.55	7.63		0.18771
5	40	83.50	7.20	0.17666	40	83.45	7.55	0.99213	0.98654
10	40	82.45	6.62	0.10135	40	83.45	7.43	0.99213	0.25943
15	40	81.05	7.19	0.04061	40	81.20	6.81	0.11356	0.87152
20	40	79.95	7.39	0.00850	40	79.90	7.26	0.04471	0.98654
25	40	78.60	8.54	0.00724	40	77.35	9.64	0.00809	0.26873
30	40	78.75	7.87	0.00710	40	78.55	8.62	0.00939	1.52778
35	40	78.15	7.07	0.00615	40	78.30	8.30	0.00876	0.89656
40	40	77.85	7.72	0.00615	40	77.20	8.27	0.00723	0.45455

45	40	76.55	8.01	0.00531	40	77.10	8.09	0.00703	0.53922
50	40	75.70	9.00	0.00515	40	78.10	19.10	0.01539	0.22949
55	40	75.15	8.77	0.00479	40	76.45	8.27	0.00646	0.24194
60	40	73.20	8.99	0.00406	40	74.65	7.93	0.00504	0.21569
75	40	72.50	7.64	0.00351	40	71.95	7.86	0.00385	0.52050
90	40	73.60	7.72	0.00387	40	71.65	8.21	0.00384	0.15082
105	40	73.08	7.88	0.00384	40	72.26	7.75	0.00395	0.36344
120	33	73.24	6.08	0.00358	36	73.22	5.78	0.00391	0.99587
135	28	72.00	6.84	0.00356	31	73.03	5.56	0.00400	0.25903
150	25	72.08	6.70	0.00370	26	72.38	6.84	0.00427	0.84523
165	20	73.50	7.73	0.00469	21	71.71	7.14	0.00438	0.21401
180	9	70.80	6.58	0.00404	11	72.47	7.16	0.00505	0.24123

- In Group BC, the mean baseline diastolic blood pressure was 85.05 with a standard deviation of 7.63. A fall in diastolic blood pressure was recorded from 5 min up to 180 min, which was statistically significant (p value < 0.05).
- In Group BD, the mean baseline diastolic blood pressure was 83.55 with a standard deviation of 7.63. A fall in diastolic blood pressure was noted from 5 min up to 180 min, which was statistically significant (p value < 0.05).
- On comparing the two groups, the fall in diastolic blood pressure was not statistically significant (p value > 0.05).

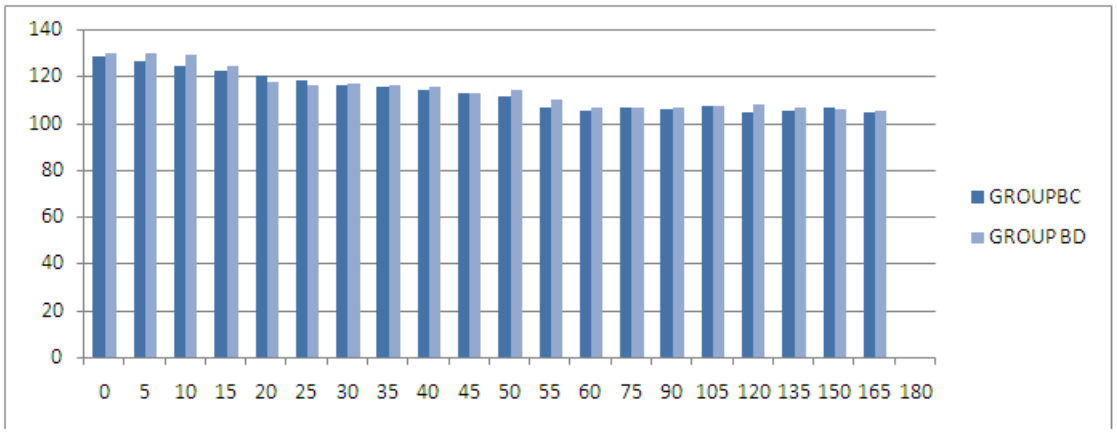

FIG:-TRENDS **IN SYSTOLIC BLOOD PRESSURE**

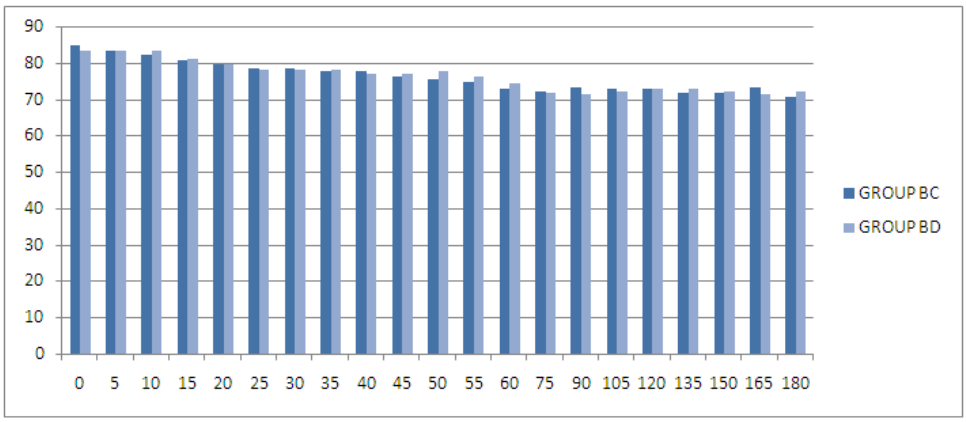

FIG:- TRNDS IN DIASTOLIC BLOOD PRESSURE

TABLE : TRENDS IN MAXIMUM LEVEL OF SENSORY BLOCK (MLSB) AMONG SUBJECTS

	Group-BC		**Group-BD**		
MSL	**No.**	**%**	**No.**	**%**	***p-value***
T11	1	2.50	0	0.00	0.10293
T10	34	85.00	29	72.50	0.10248
T9	0	0.00	1	2.50	0.14187
T8	5	12.50	9	22.50	0.09111

T7	0	0.00	0	0.00	NA
T6	0	0.00	1	2.50	0.17974

- In Group BC, 34 patients (85%) had a peak sensory block level of T10, 5 patients (12.50%) had a level of T8, and one (2.50%) had a level of T11.
- In Group BD, 29 patients (72.50%) had a peak sensory block level of T10, 9 patients (22.50%) had a level of T8, 1 patient (2.50%) had a level of T9, and one (2.50%) had a level of T6.
- There was no statistically significant difference between the groups (p value > 0.05) in the height of the peak
- sensory block achieved.

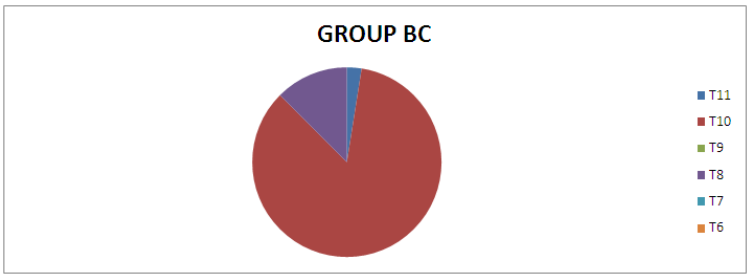

FIG: MAXIMUM LEVEL OF SENSORY BLOCK

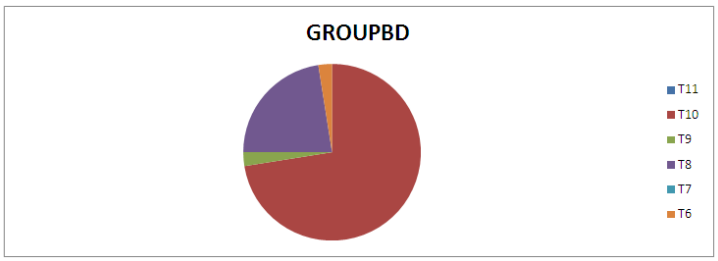

FIG: MAXIMUM LEVEL OF SENSORY BLOCK

TABLE : TIME TAKEN TO ATTAIN MAXIMUM LEVEL OF SENSORY BLOCK (IN MINUTES)

Group	**Range**	**Mean**	**SD**
BC	5-15	10.78	2.67
BD	10-15	12.63	1.33
p-value	***0.006522***		

- In Group BC, the mean time taken to attain maximum level of sensory block was 10.78 minutes with a standard deviation of 2.67.
- In Group BD, the mean time taken to attain maximum level of sensory block was 12.63 minutes with a standard deviation of 1.33.
- On comparing the two groups, the time taken to attain maximum level of sensory block was longer in Group BD, which was statistically significant (p value < 0.05).

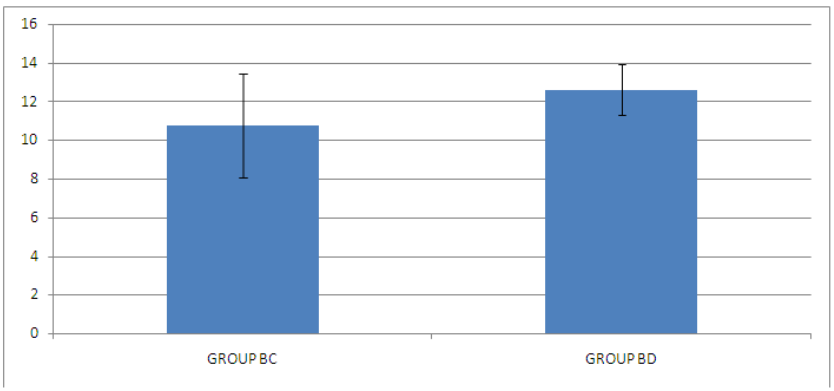

FIG. TIME TO MAXIMUM LEVEL OF SENSORY BLOCK

TABLE : TIME TAKEN TO ACHIEVE COMPLETE MOTOR BLOCKADE (IN MINUTES)

Group	**Range**	**Mean**	**SD**
BC	4-12	6.28	1.75
BD	2-5	3.48	0.99
p-value	***0.00057***		

- In Group BC, the mean time taken to achieve complete motor blockade in minutes was 6.28 with a standard deviation of 1.75.
- In Group BD, the mean time to achieve complete motor blockade was 3.48 minutes with a standard deviation of 0.99.
- On comparing the two groups, patients in Group BD took statistically significant (p value < 0.05) less time to achieve complete motor blockade.

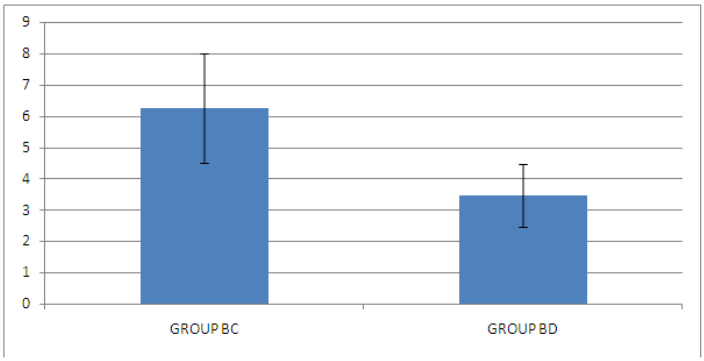

FIG. TIME TO COMPLETE MOTOR BLOCK

TABLE : DISTRIBUTION OF SUBJECTS ACCORDING TO SIDE EFFECTS

Side Effect	**Group-BC**		**Group-BD**		***p-value***
	No.	**%**	**No.**	**%**	
Nausea	0	0.00	1	2.50	***0.26274***
Vomiting	0	0.00	1	2.50	***0.14187***
Hypotension	1	2.50	2	4.00	***0.16534***
Bradycardia	0	0.00	1	2.00	***0.45455***

Nausea

No patients in Group BC, an one patient in Group BD complained of nausea. The difference was not statistically significant (p value > 0.05).

Vomiting

One patient in Group BD complained of vomiting, but none in Group BC. The difference was not statistically significant (p value > 0.05).

Hypotension

1 patient in (2.5%) in Group BC and 2 patients (5%) in Group BD had hypotension.The difference was not statistically significant (p value > 0.05)

Bradycardia

No patients in Group BC and 1 patient (2.5%) in Group BD had bradycardia. The difference was not statistically significant (p value > 0.05)

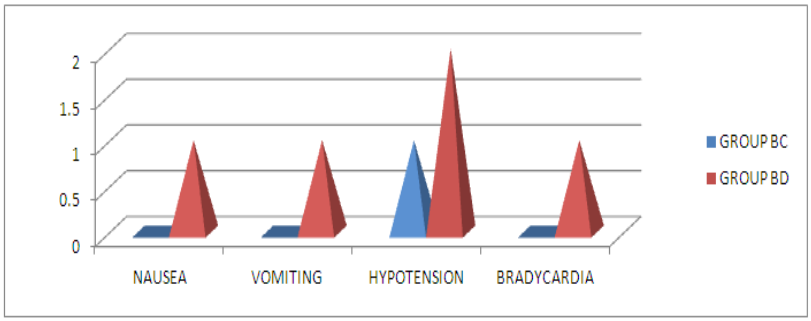

FIG: -SIDE EFFECTS AMONG GROUPS

TABLE : FREQUENCY OF SEDATION

Group	Sedated (%)	No Sedation (%)
BC	14 (35%)	26 (65%)
BD	22 (55%)	18 (45%)
p-value	***0.97059***	

14 patients (35%) in Group BC and 26 patients (55%) in Group BD had adequate sedation. There were no instances of excessive sedation in either group. The difference however was not statistically significant (p value > 0.05).

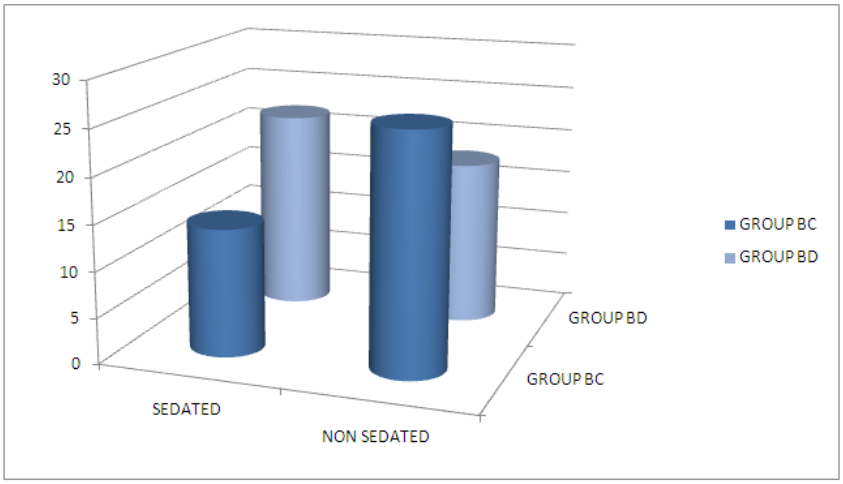

FIG: FREQUENCY OF SEDATION AMONG GROUPS

Post operatively patient's pain was graded according to VAS score and rescue analgesia was given at a VAS score of 4.

- The mean baseline VAS score in Group BC was 0.13 with a standard deviation of 0.56, whereas in Group BD it was 0.13 with a standard deviation of 0.46.
- On statistical analysis there was significant difference between the two groups at 90 minutes, 120 min, 150 min, 180 min and 210 min post operatively (p value < 0.05).
- The trend of increase in VAS score was earlier in Group BC as compared to Group BD.
- In Group BC the maximum duration of analgesia, post operatively was 210 minutes whereas in Group BD it was 330 minutes.

TABLE : DURATION OF ANALGESIA AMONG SUBJECTS (IN MINUTES)

Group	Range	Mean	SD
BC	180 – 330	261.75	33.62
BD	240 – 510	354.38	59.20
p-value	***0.000581***		

This table depicts the duration of time elapsed in minutes, from the time of onset of analgesia to the time when the first dose of analgesia was given, i.e. at VAS Score = 4.

- In Group BC the mean time was 261.75 minutes with a standard deviation of 33.62 minutes.
- In Group BD the mean time was 354.38 minutes with a standard deviation of 59.20 minutes.
- On comparing the two groups, Group BD had a longer duration of analgesia which was statistically highly significant (p value < 0.0005).

TABLE : TIME OF REGRESSION TO T12 AMONG SUBJECTS (IN MINUTES)

Group	Range	Mean	SD
BC	90 – 180	149.25	24.01
BD	150 – 300	197.63	36.72
p-value	***0.003702***		

This table depicts the duration of time elapsed in minutes, from the time of onset of sensory blockade to the time when the sensory blockade level had regressed to T12 level.

- In Group BC the mean time taken was 149.25 minutes with a standard deviation of 24.01 minutes.

- In Group BD the mean time taken was 197.63 minutes with a standard deviation of 36.72 minutes.
- On comparing the two groups, Group BD had a longer duration of sensory block, and the difference was found to be statistically significant (p value < 0.05).

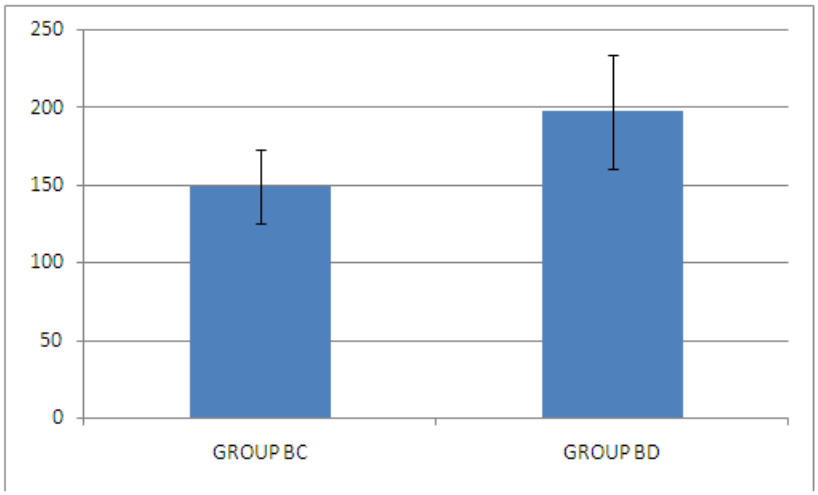

FIG. TIME TO REGRESSION TO T12

TABLE :

TIME UNTIL FULL RETURN OF MOTOR FUNCTION (IN MINUTES)

Group	**Range**	**Mean**	**SD**
BC	150 – 270	191.25	25.13
BD	225 – 510	283.13	57.56
p-value	***0.00054***		

This table depicts the duration of time elapsed in minutes, from the time of onset of motor blockade to the time when motor function is completely recovered in the lower extremities (Modified Bromage Score = 0).

- In Group BC, the mean time taken was 191.25 minutes with a standard deviation of 25.13, whereas in Group BD it was 283.13 minutes with a standard deviation of 57.56.
- On comparing the two groups, Group BD had a longer duration of motor blockade, which was statistically highly significant. (p value <0.0005).

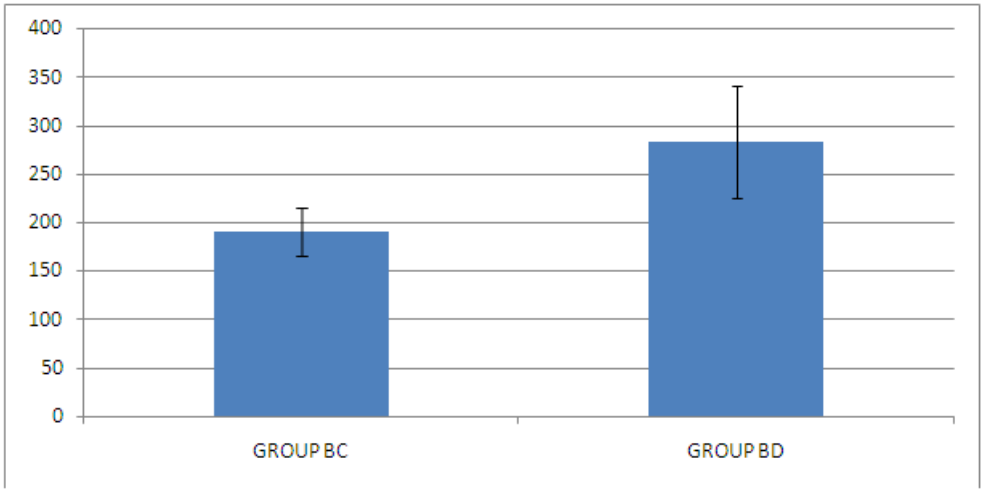

FIG: TIME UNTIL RETURN OF MOTOR FUNCTION

IV. Discussion

Alpha 2 – adrenergic agonists such as clonidine and Dexmedetomidine have come to play a major and reliable role in enhancing the duration of spinal anaesthesia.

Clonidine has an alpha 2:alpha 1selectivity ratio of approximately 220:1 where as the alpha 2:alpha 1 selectivity for Dexmedetomidine is 1520:1.Alpha 2 adrenergic agonism produces analgesia which is mediated in the superficial layers of the dorsal horn in the spinal cord.In our study we have evaluated the efficacy of intrathecal clonidine 30 micro grams added to 2.5 ml of 0.5% heavy Bupivacaine and intrathecal Dexmedetomidine 5 micrograms added to 2.5 ml of 0.5% heavy Bupivacaine.

In Kanazi et al' study[8] of low dose intrathecal Dexmedetomidine and clonidine as adjuvants to intrathecal Bupivacaine ,they found that 3 µg Dexmedetomidine intrathecally was not associated with any side effects postoperatively.This is comparable to our study also.

Al –Ghaneur et al's study[9] concluded that 5 µg Dexmedetomidine seems to be an alternative as adjunct to spinal bupivacaine in surdical procedures of **of long duration** with minimal side effects and excellent quality of analgesia which is in concurrence to our study.

Time taken for regression of sensory blockade ; Kanazi GE et[8] al in their study on the effect of low dose Dexmedetomidine 30 µg and clonidine 3 µg on the characteristics of Bupivacaine spinal block reported that the sensory block regression times of the two dermatomes and to the S 1 dermatome were significantly different between the Bupivacaine group and that of the clonidine and Dexmedetomidine groups.This is in correlation with our study.

In the study conducted by strebel et al[10] in 2004 the duration of sensory block was prolonged by the addition of intrathecal clonidine in a dose dependent manner.This is comparable to our study.

Gupta et al[11] in their study evaluating the efficacy and safety of intra thecal Dexmedetomidine 5 µg added to Ropivacaine with Ropivacaine alone also concluded that the addition of Dexmedetomidine to Ropivacaine intrathecally produces a prolongation in the duration of the motor and sensory block which is comparable to our study.

In our study the trend in regression of sensory blockade to T 12 level was earlier in group BC as compared to group BD.The mean time taken from the onset of sensory blockade to regression to T12 level was longer in group BD (197.63 ± 36.72 min) as compared to group BC (149.25 ± **24.**01 min).This difference was statistically significant (p value = 0.003).

V. Summary

Bupivacaine spinal anaesthesia is prolonged by intrathecally administered Clonidine 30 µg and Dexmedetomidine 5 µg, with minimal influence on haemodynamic parameters.

Addition of 5 µg Dexmedetomidine significantly prolonged the duration of sensory blockade, motor blockade and post-operative analgesia as compared to the addition of 30 µg of clonidine. Nevertheless, the relatively small number of patients included in our study, warrants larger studies to conclusively evaluate the effects of varying doses of intrathecal Clonidine and Dexmedetomidine in association with Bupivacaine spinal anaesthesia.

VI. Conclusion

We conclude from the present study that

1. 5 µg of Dexmedetomidine given intrathecally along with 0.5% hyperbaric Bupivacaine has a faster onset of motor blockade as compared to 30 µg of clonidine.
2. 5 µg of Dexmedetomidine given intrathecally along with 0.5% hyperbaric Bupivacaine has a longer duration of sensory blockade, motor blockade and analgesia as compared to 30 µg of clonidine.
3. There was a statistically significant fall in systolic and diastolic blood pressure in both the groups. However, on comparing the two groups, there was no statistically significant difference in the fall in blood pressure between the groups.
4. The difference in the incidence of sedation between the two groups is not statistically significant.
5. The incidence of side effects was minimal in both the groups, and the difference between the groups was statistically insignificant.

Bibliography

[1]. Gordh T Jr, Post C, Olsson Y. Evaluation of the toxicity of subarachnoid clonidine, guanfacine, and a substance P-antagonist on rat spinal cord and nerve roots: light and electron microscopic observations after chronic intrathecal administration. Anesth Analg 1986; 65 (12): 1303–11.

[2]. Eisenach JC, et al. a2-adrenergic agonists for regional anaesthesia: a clinical review of clonidine (1984-1995). Anaesthesiology; 1996:85, 655-674.

[3]. Sethi BS, Samuel M, Sreevastava D. Efficacy of analgesic effects of low dose intrathecal clonidine as adjuvant to bupivacaine. Indian J. Anaesth. 2007; 51(5): 415–419.

[4]. Virtanen R, Savola JM, Saano V, Nyman L: Characterization of the selectivity, specificity and potency of medetomidine as an alpha 2-adrenoceptor agonist. European Journal of Pharmacology, 1988; 150: 9-14.
[5]. Aho M. Erkola O. Korttila K. Alpha-2 Adrenergic agonists in anaesthesia. Curr Opin Anaesthesiol 1992; 5:481.
[6]. Bhana N, Goa KL, McClellan KJ: Dexmedetomidine. Drugs, 2000; 59:263-268.
[7]. Bromage PR. Philadelphia: WB Saunders; 1978: 144.
[8]. Kanazi GE, Aouad MT, Jabbour-Khoury SI, Al Jazzar MD, Alameddine MM, Al-Yaman R, Bulbul M, Baraka AS. Effect of low-dose dexmedetomidine or clonidine on the characteristics of bupivacaine spinal block. Acta Anaesthesiologica Scandinavia, 2006; 50:222-227.
[9]. Al-Ghanem SM, Massad IM, Al-Mustafa MM, Al-Zaben KR, Qudaisat IY, Qatawneh AM, et al. Effect of adding dexmedetomidine versus fentanyl to intrathecal bupivacaine on spinal block characteristics in gynecological procedures. Am JApplSci2009;6:882-7.
[10]. Strebel S , Jürg A. Gurzeler, Schneider m .c, Aeschbach A, Kindler c.h, Small- Dose Intrathecal Clonidine and
[11]. Isobaric Bupivacaine for Orthopedic Surgery: A Dose- Response Study Anesth Analg 2004;99:1231-1238 (s)
[12]. Gupta R, Bogra J, Verma R, Kohli M, Kushwaha J K, Kumar S. Dexmedetomidine as an intrathecal adjuvant for postoperative analgesia. Indian J Anaesth 2011;55:347-51.

Dr.B.Trinath Kumar. "A Comparative Study of Anaesthetic & Haemodynamic Effects of Intrathecal Dexmedetomidine & Clonidine as Adjuvants To 0.5% Hyperbaric Bupivacaine.. "IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 18, no. 1, 2019, pp 43-53.