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Research Paper

Intravenous Dexmedetomidine Prolongs Motor and Sensory Effect of Spinal Anaesthesia

Medical Science

KEYWORDS :

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INTRODUCTION:-

Spinal anesthesia is a well-known technique used in lower abdominal and lower limb surgery DEXMEDETOMIDINE, α-2 agonist has been used as pre-medication and as an adjunct to general anesthesia. It decreases the inhalational anesthesia and opioid requirement during GeneralAnaesthesia

Small doses of dexmedetomidine (3 μg) used in combination with bupivacaine in spinal anaesthesia produces a shorter onset of motor block and a prolongation in the duration of motor and sensory block.

We hypothetised that intravenous dexemedetomidine started after spinal anaesthesia also prolongs effect of spinal block.(1)

AIM:-

- To evaluate and compare motor and sensory effect of intrathecal Bupivacaine(hyperbaric) analgesia along with intravenous dexmedetomidinesupplemention(2)
- To assess the hemodynamic changes, level of sedation and effective post operative analgesia.

MATERIAL AND METHOD:-

Following approval of the institutional Committee and obtaining written informed consent from patients, fifty patients, ASA I-II, scheduled for lower abdominal and lower limb surgery were enrolled in the study.

EXCIUSION CRITERIA:-

- Patients with history of known allergies to study drugs.
- Emergency surgeries
- Unwilling patients
- Patient having circulatory and cardiovascular failure, shock , severe anemia
- Patient on anticoagulant therapy
- Anatomical deformity of spine
- Local tissue infect

PRE-STUDY EVAIUATION:-

Pre-anaesthetic evaluation of all patients consists of detailed history, clinical examinationand routine investigations. Written and informed consent was taken. All patients were keptnilorally 6hours prior to surgery. Vital signs noted in preoperative roomand considered as baseline values. All procedure was explained to the patients

PRE MEDICATION

In preoperative room, inj.ondansatron 0.1mg/.kgi.v was givenprior to induction. On entering operation theatre, IV line secured with 18G IV canulaand pulse-oximeter,non invasive blood pressure(NIBP) and ECG monitor were applied. Heart rate, systolic BP(SBP), diastolic BP (DBP) and mean arterial pressure (MAP) were recorded

STUDY GROUP

50 patients of lower abdominal or lower limb surgery were randomly allocated into two equal groupsreceiving spinal analgesia withhyperbaric Bupivacaine 15 mg.

GROUP D(25 patients)

Immediately after spinal analgesia;

Each Patient received i.v. loading dose of 1μg /kg dexmedatomidine over 10 min followed by maintenance dose of 0.5 μg/kg / hr till end of surgery.

GROUP C (25 patients)

Each patient received normal saline same as group D

ANESTHESIA TECHNIQUE

Under all strict aseptic and antiseptic precaution patients in left lateral position using 23 G spinal needle was inserted in L3-L4 space via mid line approaching bupivacaine heavy 15mg was given after free flow of clear csf.

Patients lay down to supine position after motor blockage and loading infusion of dexemetomidine after 10 min of intrathecal injection or NS started.

MONITORING

- After performing the spinal block, the vital signs were recorded at 1,5,10,15,20,25,30,45 minutes in the operation room and every 30 minutes in the Post Anesthesia Care Unit (PACU) until the patient was discharged to his ward.
- Time required to sensory level T10 sensory onset and motor blockage by modified Bromage scale.
- Time required grading 3 motor blockages, time for sensory regression to S2.
- Total duration of analgesia from sensory level T10 to fist resume analgesia in min.
- Sedation was accessed by ramsay score.
- Patients were observed for intraoperative complication as bradycardia,hypotension,sedation,shivering,nausea, vomiting ,respiratory depression.
- Postoperative pain was accessed by VAS score which was explained to patients preoperatively.

Bromage criteria:-

SCALE	CRITERIA	DEGREE BLOCK
0	Free movement of legs and feet with ability to raise extended legs.	None
1	Inability to raise extended leg and knee flexion decreased, but full flexion of feet and ankle is present.	Partial (33%)
2	Inability to raise leg or flex knees, but flexion of ankle and feet present.	Partial(66%)
3	Inability to raise leg, flex knees or ankle or move toes.	Complete paralysis

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Ramsay score:-

1. Patient anxious, agitated, or restless;
2. Patient cooperative, oriented, and tranquil alert;
3. Patient responds to commands;
4. Asleep, but with brisk response to light glabellartap or loud auditory stimulus;
5. Asleep, sluggish response to light glabellar tap or loud auditory stimulus
6. Asleep, no response

Visual Analogscale (VAS):-

VAS is a continuous scale comprised of horizontal (HVAS) or vertical (VVAS) line usually 10cm (100mm) in length. For pain intensity, the scale is most commonly anchored by no pain (score 0) , worst imaginable pain (score 100). Based on the distribution of pain VAS scores inpostsurgical patients who described their post operative pain intensity as

- No pain (score o-4mm)
- Mild pain (score 5-44 mm)
- Moderate pain (score 45-74mm)
- Severe pain (score 75-100mm)

STATISTICAL ANALYSIS:-

Descriptive data of both groups were compared byunpaired "t" test. For all thetests "p" value of less than 0.05 was considered for statistical significance

OBSERVATION AND RESUITS:-

TABLE1: DEMOGRAPHIC DETA

The Demographic data like age, sex, height and weight did not differ significantly between the two study groups.

Age	40±25	40±25
Sex (M/F)	19/6	19/6
ASA(I/II)	19/8	15/9
Height	165±7	165±8
Weight	60.1±4	60.4±4.2

TABLE 2: ONSET AND REGRESSION TIME IN MIN

	Onset(min)		Regression(min)	
	Motor (Bromage 3)	Sensory (T10)	Motor (Bromage 0)	Sensory (S1)
Group C	5.2±0.8	4.35±0.7	196±27.2	214.5±26.5
Group D	8±0.6	4.25±0.5	290±23.4	340±24

Time of onset of sensory and motor effect after spinal block is slightly prolonged in group D and Time to regression to S1 dermatome and Bromage scale 0, was significantly prolonged in group D in comparison with group C. The regression time to S1 in group C was 196± 27.2 min and group D 290 ± 23.4 min, the P value <0.0001. The regression time to reach the Bromage 0 scale was 214.5 ± 26.5min in group C and 340 ±24 min in group D, the P value <0.0001 (Table 2)

TABLE3:-PER OP SEQUELE,ADVERSE REACTION AND TREATMENT.

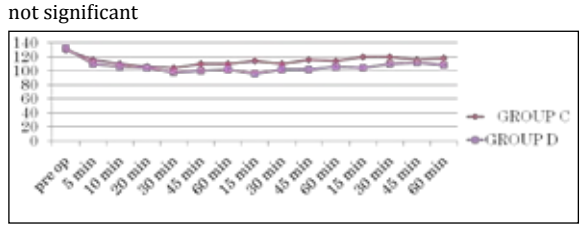
	GROUP C	GROUP D	
Total iv (fluid) liter	1.70		1.72
Blood Transfusion	4%		4%
Additive analgesia	12%		0%
Nausea and vomiting	8%	4%	
Bradycardia	8%	12%	
Hypotension	12%	16%	
Atropine	4%	8%	
Mephentermine	8%	8%	

HR, MAP and level of sedation of both the groups were compared statistically. Group D showed significant decrease in HR and MAP after loading infusion of Dexmedetomidine. Though there was decrease in MAP, patients were hemodynamically stable throughout the duration of surgery. Out of 25 patients in Group D, 12% patient were reported to have significant bradycardia (pulse < 60) per operatively, 1 of them required dose of Atropine (0.6mg IV) to overcome bradycardia. Out of 25 patients in group D, 16% patients had hypotension which was coreected by 1 liter of IV fluid (RL or DNS) in which 8% patients corrected with 6mg of IVmephentermine given. Out of 16%, 8% patients required IV mephentermine. And 4% patient required blood transfusion. However, requirement of additional analgesic was decreased in Group D. Only 4%patient was given additive analgesia inform of IV fentanyl 1µg/kg compared to 16% of Group C. Also, duration of requirement of first dose of post operative analgesic was prolonged in Group D(8)

DISCUSSIONS:-

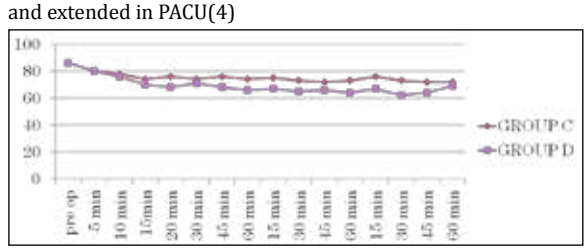
1, Comparison of BP

These graph shows that hypotensive effect of dexmedetomidine persists in intraoperative as well as in the postoperative period.(3) In our patients the mean arterial pressure was also decreased in the group D as well as group C andclinically was not significant



2. Comparison of HR

The heart rate was decreased significantly in group D as compare to group C after the start of IV infusion dexemedetomidine and extended in PACU(4)



3. Duration of post op Analgesia

	GROUP C	GROUP D	P value
TIME (MIN)	100-150	240-280	< 0.05
MEAN(STD)	126.7±13.6	220±18	<0.05

4. Levelof sedation

Level of sedation was assessed by ***RAMSEY*** score. In group C, patients were awake(scale 1-2) . In group D , sedation scale range from 2-4. Maximum mean sedation score achieved 30 minutes after starting i.v.dexmedetomidine. The oxygen saturation was higher than 95% in all patient in the two groups either intraoperative or in PACU.

CONCIUSION:-

Duration of motor-sensory block and analgesia is prolonged in group D.

- If surgery is prolonged after spinal analgesia has been given, and if it is conducted by i.v.dexmeditomidine, no need to give supplemented GA.
- So It is useful in which time required for surgery is unpredictable like micro vascular surgery
- Per op good sedation level is achieved ,so it is advantageous in anxious patients and enables their co operation and better operating condition for surgeon without significant res-

piratory depression.(7)

- Post op analgesia is also prolonged, so patients lying comfortablypost operatively.(9)
- In nutshell with IV Dexmedetomidinesupplementation to Intrathecal bupivacaine anesthesia prolongation of sensory and motor blockage as well as effective postoperativeanalgesia.

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