Original Research Paper

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TO COMPARE DURATION BETWEEN 0.5% ROPIVACAINE ALONE VERSUS 0.5% ROPIVACAINE WITH DEXMEDETOMIDINE IN PNS GUIDED SUPRACLAVICULAR BLOCK FOR POST OPERATIVE ANALGESIA.

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ABSTRACT In modern days regional anaesthesia, a peripheral nerve block is a key anaesthetic method. Success rate, as well as safety, are the two most crucial requirements for using peripheral regional anaesthesia in routine clinical practice. **Methods:** 72 participants, split into two groups of 36 each, participated in a randomised study. In groups A and B. 30 ml of 0.5% ropivacaine & 0.5 ml of saline were administered to group A, while group B received 30 ml of 0.5% ropivacaine as well as 0.5 mcg/kg of dexmedetomidine. The BP, pulse rate, & respiration rate of the patients were assessed. **Results:** The study included a total of 72 individuals who have been scheduled to undergo elective upper limb surgeries under PNS-guided blocks. The following two groups (each with 36 participants) were assigned randomly to the participants using computer-generated random numbers: 0.5 ml of saline as well as 30 ml of 0.5 per cent ropivacaine were given to the patients in group R; 0.5 mcg/kg of dexmedetomidine with 30 ml of 0.5 per cent ropivacaine were given to the patients in group RD. **Conclusion:** In the current study, it was discovered that when compared to either a group with or without the adjuvant, the duration of things such as the length of surgical analgesia, the motor as well as sensory block, and were prolonged when dexmedetomidine was added to regional anesthesia to block its supraclavicular brachial plexus.

KEYWORDS : Analgesic effect, Ropivacaine, Dexmedetomidine, Supraclavicular blocks

INTRODUCTION

In modern days regional anaesthesia, a peripheral nerve block is a key anaesthetic method. Success rate, as well as safety, are the two most crucial requirements for using peripheral regional anaesthesia in routine clinical practice. Most procedures on the upper limbs underneath the shoulder joint are carried out while receiving peripheral blocks, like that of the brachial plexus blocks [1]. By reducing overall stress response including using fewer anaesthetic medicines, peripheral nerve pinches not just offer intra-operative analgesia throughout the post-operative period but also maintain anaesthesia while causing significant systemic side effects [2].

The local anaesthetic ropivacaine, an amino-amide, inhibits various peripheral afferents which operate on voltage-dependent Na+ channels. Compared to others Bupivacaine is one example of a long-acting local anaesthetic that poses less risk towards the heart as well as the central nervous system [3]. During supraclavicular brachial plexus block, local anaesthetics offer adequate operating parameters yet have a shorter postoperative analgesia duration. To achieve rapid, dense, and persistent brachial plexus block, several adjuvants, including opioids, clonidine, neostigmine, dexamethasone, midazolam, etc., are introduced into local anaesthetics. However, the findings could be clearer or linked to side effects [4].

When administered systemically, dexmedetomidine is a highly powerful, specific, and selective Analgesic, sedative, and antihy pertensive, as well as anaesthetic-sparing properties of a 2-adrenergic agonist [5,6]. For peripheral nerve suppression including regional anaesthesia operations, mixing dexmedetomidine with local anaesthetics may also be beneficial in surgical patients. Dexme detomidine has also demonstrated that human studies that when coupled to local anaesthetic with various regional blocks, its block's duration as well as post-operative analgesia are prolonged [7].

Due to the substantial rise in the number of autonomous automobiles on the roads, the incidence of different traffic traumas is currently rising. One of them is a fractured upper limb [8,9]. Individuals with upper limb fractures often receive analgesia through brachial plexus blocking before surgery to lessen their intense pain. However, for a variety of reasons, individuals with upper limb fractures are frequently extremely apprehensive but also nervous before and during surgery, which can cause a drop in heart rate (HR), an increase in blood pressure, and sometimes even shock [10].

Since it is easy to give and enables individuals to complete the surgery while also still conscious, brachial plexus conservative treatment is the preferred type of anesthesia throughout upper extremity procedures [11]. Yet it's crucial to administer the right analgesics. Conventional analgesics like fentanyl have potent analgesic effects, but investigators have discovered that they're prone to over-anaesthesia, which effectively raises perioperative risks as well as hinders postoperative recovery. Currently, a method of ongoing brachial plexus blockade guided by ultrasound has been devised, allowing local anaesthetics to be delivered through a connecting pipe set up with the use of visualising technology, sporadically or constantly through into the region to be blocked. This method satisfies patients' postoperative analgesic needs and is incredibly easy to use. It allows the anaesthetic dose to be adjusted by the length of the operation [12,13].

MATERIALS & METHODS

Study Design

Individuals who arrived at this hospital's outpatient department and then were scheduled for voluntary upper extremity procedures were the subjects of a randomised control study. This study comprised several 72 patients, who were split into two groups of 36 each. group B received 30 ml of 0.5% ropivacaine as well as 0.5 mcg/kg of dexmedetomidine, while group A received 30 ml of 0.5% ropivacaine but also 0.5 ml of saline [14].

Patients were evaluated for BP, pulse rate, and respiratory rate [7]. ECG, pulse oximeter, and NIBP monitors were attached. Intravenous access is secured using a 20G dwelling cannula. The needle was introduced, PNS was switched on, and the current decreased to 0.2- 0.3 mA. When muscle contraction was seen at 0.4mA and no contraction at 0.2mA needle is injected, and after negative aspiration, local anaesthetic is injected [15].

Six hours, twelve hours, twenty-four hours, and forty-eight hours following the surgery, pain was evaluated using the VAS scale. A visual analogue scale (VAS) is indeed a recognised, apparent measurement both for chronic and acute pain [16]. Handwritten markings are employed to record scores along a 10-cm line that represents a continuum between "no pain" and "worst agony". Sedation was assessed using the Ramsay Sedation Scale [17].

Conditions for Inclusion

1. ASA grades 1 and 2
2. Between the ages of 18 and 65,

3. Elective upper limb surgery

Exclusion Standards

1. Patients who refuse treatment
2. Develop local infection just at the block site.
3. Patients with coagulopathy;
4. Local anaesthesia allergy.
5. The patient's blockage is insufficient, they need more IV sedation than Butorphanol as well as Midazolam combined, or perhaps the case progresses to general anaesthesia.
6. 100 kg in weight

Statistic evaluation

ANOVA statistical software was used for data entry as well as statistical analysis. By using average scores, standard deviations, and using t-tests, statistically, appropriate percentage comparisons between the various groups were made. The threshold for significant data was indeed a P-value of 0.05.

Ethical endorsement

Before the trial began, each patient had to provide written consent. The Ethics Committee of the relevant hospital has given its approval to the study's methodology.

RESULTS

A total of 72 individuals, who were scheduled to undergo elective upper limb operations underneath PNS-guided block surgery were included in the study [18,19]. Utilizing computer-generated random values, the cases were split into a single the two groups (each with 36 cases) as follows (Table 1):

- Patients in group R received 0.5 ml of saline plus 30 ml of 0.5% ropivacaine.
- Patients in group RD got 0.5 mg/kg of Dexmedetomidine and 30 ccs of 0.5% Ropivacaine.

Table 1: Subjects are divided according to the study medication.

Group	N	%
Ropivacaine (R)	36	50
Ropivacaine + Dexmed (RD)	36	50
Total	72	100

In contrast to group R, cases in the RD group experienced sensory block much sooner (6.83 vs. 9.14 mins; p0.01). Moreover, group RD cases had a sensory block for a longer period (709.17 vs. 506.53; p=0.01) (Table 2).

Table 2: Comparison of the average sensory block parameters across study groups

Sensory Block	Group	N	Mean	SD	P-Value
Onset (mins)	R	36	9.14	0.76	<0.01
	RD	36	6.83	0.66	
Duration (mins)	R	36	506.53	19.08	<0.01
	RD	36	709.17	32.53	

As opposed to group R, cases in the RD group experienced motor block substantially sooner (9.03 vs. 13.11 mins; p=0.01). Moreover, instances in group RD had longer periods of motor block (667.08 vs. 479.17; p=0.01) (Table 3).

Table 3: Comparison of the mean motor block properties between research groups

Motor Block	Group	N	Mean	SD	P-Value
Onset (mins)	R	36	13.11	0.85	<0.01
	RD	36	9.03	0.7	
Duration (mins)	R	36	479.17	18.96	<0.01
	RD	36	667.08	19.18	

When ropivacaine and dexmedetomidine were used to treat patients, the duration of postoperative analgesia was noticeably longer (832.92 vs 570.69; p0.01) (Table 4).

Table 4: Comparison of the average post-operative analgesic duration between study groups

Duration of Post-op Analgesia (mins)	Group	N	Mean	SD	P-Value
	R	36	570.69	15.77	<0.01
	RD	36	832.92	33.5	

In cases treated with ropivacaine and dexmedetomidine, the time needed for the first rescue analgesic to take effect was substantially longer (851.53 vs. 590.42; p0.01) (Table 5).

Table 5: Comparison of the average time needed for rescue analgesia between research groups

Duration for Rescue analgesia (mins)	Group	N	Mean	SD	P-Value
	R	36	590.42	14.75	<0.01
	RD	36	851.53	34.29	

In comparison to group R, the mean VAS score was considerably lower in instances of group RD [20]. From the sixth hour through the end of the 24th hour, the difference was seen to be significant (p 0.01) (Table 6).

Table 6: Comparison of the mean VAS scores between research groups

VAS Score	Group	N	Mean	SD	P-Value
6hr	R	36	0.28	0.45	<0.01
	RD	36	0	0	
10hr	R	36	4.36	0.49	<0.01
	RD	36	0.14	0.42	
14hr	R	36	6.33	0.48	<0.01
	RD	36	4.14	0.48	
18hr	R	36	8.36	0.49	<0.01
	RD	36	5.92	0.5	
24hr	R	36	10	0	<0.01
	RD	36	8.22	0.64	

In neither group's cases did any complications like PONV, bradycardia, or hypotension appear (p-1.0) (Table 7).

Table 7: Study groups are distributed according to complications

Complications	Group		Total
	R	RD	
PONV	0	0	0
	0	0	0
Hypotension	0	0	0
	0	0	0
Bradycardia	0	0	0
	0	0	0

DISCUSSION

A study was conducted to investigate the effect to give an alternate anaesthetic method during upper limb trauma surgery, this randomised controlled trial compared Compared to ropivacaine by itself, dexmedetomidine and ropivacaine had analgesic effects on brachial plexus block [21,22]. In particular, before and following surgery, ropivacaine plus dexmedetomidine had a better brachial plexus block efficacy than ropivacaine alone. It has been done by adding various chemicals to extend the brachial plexus block [23]. We looked at the impact of ropivacaine and dexmedetomidine combined to block a supraclavicular brachial plexus. The onset, as well as the duration of the acute. The key results have been the degree of motor and sensory inhibition and the duration of analgesia [24]. The motor, as well as the sensory block, is prolonged when dexmedetomidine is added following the brachial plexus and supraclavicular brachial blockade, delays the onset of the initial analgesic, as well as reduces overall analgesic use without causing any negative side effects. Dexmedetomidine's effects just on the beginning and length of the block, in addition to postoperative analgesia after This study, focused on that supraclavicular brachial plexus blockade amongst patients who undergo surgeries on their upper limbs [25]. We conclude that for patients who undergo upper limb procedures, a combination of dexmedetomidine with ropivacaine-lidocaine increased postoperative analgesia and lengthened the durability of supraclavicular brachial plexus block without causing any negative side effects [26].

A novel agonist of the 2 receptors having analgesic and sedative characteristics is dexmedetomidine. Dexmedetomidine and ropivacaine were administered to block the supraclavicular brachial plexus [27,28]. Dexmedetomidine and ropivacaine combined with the brachial plexus and supraclavicular block postpone the onset of something like the motor and sensory block and lengthens its duration. Individual studies have demonstrated the value of dexmedetomidine as well as dexamethasone as nothing more than a ropivacaine adjuvant. In an SCBP block that is guided by ultrasound, researchers examined the effectiveness of ropivacaine combined with dexmedetomidine

versus ropivacaine combined with dexamethasone. Dexmedetomidine and dexamethasone simultaneously speed up the onset of the SCBP block as well as lengthen its duration when added as adjuvants with ropivacaine [29].

CONCLUSION

In the current investigation, it was found that adding dexmedetomidine to a local anaesthetic to block its supraclavicular brachial plexus lengthened the duration of something like the motor and sensory block as well as the length of postoperative analgesia when compared to either a group that did not receive the adjuvant. In these situations, the post-op VAS scores were likewise lower during the 24-hour follow-up period. Hence, the results of this study suggest using dexme detomidine in conjunction with ropivacaine to provide postoperative analgesia after PNS-guided supraclavicular blocks.

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