

Comparative Study of 0.5% Centbucridine and 2% Lignocaine in Supraclavicular Brachial Plexus Block for Upper Limb Surgeries

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Abstract: ***Introduction:** Centbucridine is a new drug, which has a promising future in supraclavicular brachial plexus block. **Objective:** This study is to compare the drugs 0.5% centbucridine and 2% lignocaine in supraclavicular block for upper limb surgeries. **Methods and Materials:** Sixty patients between the age from 15 to 60 were randomly allocated into 2 groups. One group received 0.5% centbucridine and other received 2% Lignocaine during the supraclavicular block, which was performed with guidance of nerve stimulator. The parameters like onset of sensory blockade, motor blockade, duration of analgesia were noted. **Results:** Comparing the both groups, 2% lignocaine has quicker onset of sensory and motor blockade and longer duration of analgesia over 0.5% centbucridine. **Conclusion:** The new drug 0.5% centbucridine had slow onset of sensory and motor blockade and less duration of analgesia than 2% lignocaine. But the parameters were comparable and quality of surgical anaesthesia was good.*

1. Introduction

Regional Anaesthesia is known for its advantages like superior pain management, early ambulation, and cost effectiveness. With advancement in medical facilities, there is an increased incidence of aged population with wide range of co morbid conditions presenting for surgical procedure for whom regional anaesthesia alone or in conjunction with general anaesthesia plays a pivotal role in reducing the morbidity.

The prime importance in practise of regional anaesthesia will be to target local anaesthetics precisely to the concerned nerve. Brachial plexus block will be most common block performed for upper limb surgeries. Of these supraclavicular block remains most popular among practising anaesthesiologists. In performing supraclavicular block various tools like nerve stimulator and ultra sonogram aids to target the desired nerve. Equally important as the technique is the understanding the importance of pharmacology of local anaesthetics. They form a corner stone of regional anaesthesia by providing reversible nerve block. Commonly used local anaesthetics will be lignocaine and bupivacaine. Both these drugs remain popular mainly due to their safe and predictable pharmacokinetics and pharmacodynamics. The need for safe and ideal local anaesthetic is undeniable and various researches are going on to overcome this need.

Centbucridine, 4-N-Butylamino-1,2,3,4-tetrahydroacridine Hydrochloride, chemically discovered by Central Drug Research Institute, Lucknow. This local anaesthetic is a new chemical moiety and has no relation whatsoever with lignocaine. This study was to assess the reliability of newly found local anaesthetic drug in nerve blocks.

2. Methods and Materials

This study was conducted in a tertiary care hospital after obtaining approval from the institutions Ethical committee. The study is a prospective, randomised and double blinded

study. The study population was patients undergoing below elbow surgeries. The inclusion criteria will be patients between age 15-60 years and ASA Physical Status 1 and 2. The exclusion criteria will be Patient refusal, Patients with hypersensitivity to local anaesthetics and coagulation abnormality.

Sixty patients were included in this study and they were randomly allocated into two groups, Group C and Group L. Group C patients will receive Centbucridine in the dose of 2mg/kg and Group L patients Lignocaine in the dose of 3mg/kg. Supraclavicular block was performed using nerve stimulator using 50mm, 22 Gauge Teflon coated needle. Onset, duration and quality of sensory and motor blockade were compared between these groups.

The parameters observed were time of onset of sensory block which was noted by loss pin prick sensation at appropriate dermatomal level, onset of motor block (Using Bromage Scale), time of rescue analgesia, duration of surgery, complications, parameters like pulse rate, blood pressure and SpO₂ and use of anxiolytics.

3. Statistical Analysis

The information collected regarding all the selected cases were recorded in a master chart. Data analysis was done with the help of computer by using SPSS software and Sigma Stat 3.5 version (2012). Using this software, percentage, mean, standard deviation and 'p' value were calculated through One way ANOVA, and Chi square test and P value of < 0.05 was taken as significant. Categorical data were analysed between two groups using chi square test.

4. Observation and Results

The demographic factors like age, gender and weight of the patients between the two groups were compared. All the factors were comparable and found to be statistically not significant. (Table 1,2,3.)

Table 1: Age distribution

Age Distribution	Group C	Group L
< 20	5	6
21 - 40	12	13
41 - 60	10	9
>60	3	2
Total	30	30
Mean	39.1	35.8
SD	16.79	14.26
p value	0.415 Not significant	

Table 2: Sex Distribution

Sex	Group C	Group L
Male	17	17
Female	13	13
p value	0.830 Not significant	

Table 3: Weight Distribution

Weight	Group C	Group L
Mean	60.9	58.53
SD	9.05	9.64
p value	0.331 Not significant	

The mean onset of sensory blockade in Group C is 5.65 minutes and in Group L is 5.5 minutes (Table 4).

Table 4: Onset of sensory block

Onset Sensory Block	Group C	Group L
Mean	5.65	5.5
SD	0.5	0.95
p value	< 0.553 Not Significant	

The mean onset of motor blockade in Group C is 11.93 mts and Group L is 11.5 minutes (Table 5).

Table 5: Onset of Motor block

Onset Sensory Block	Group C	Group L
Mean	5.65	5.5
SD	0.5	0.95
p value	< 0.553 Not Significant	

The mean duration of analgesia in Group C and Group L will be 60.50 and 70.50 minutes respectively. This value is statistically significant with p value of <0.001. (Table 6)

Table 6: Duration of Analgesia

Duration in min - Analgesia	Group C	Group L
Mean	60.5	70.5
SD	6.08	6.34
p value	< 0.001 Significant	

The mean duration of motor blockade in both groups was 56.50 and 65.50 minutes, which was also statistically significant (Table 7).

Table 7: Duration of motor block

Duration in min - Motor block	Group C	Group L
Mean	56.5	65.5
SD	3.88	3.93
p value	< 0.001 Significant	

The mean time of onset for rescue analgesia was noted in both groups and in Group C it was after 93.6 minutes and in Group L it was after 102.7 minutes. This value was found to be statistically significant. (Table 8)

Table 8: Onset of rescue analgesia

Rescue Analgesia(min)	Group C	Group L
Mean	93.63	102.7
SD	9.17	8.52
p value	< 0.001 Significant	

5. Discussion

Regional Anaesthesia is evolving in rapid pace after the use of nerve stimulators and ultra sonogram. Use short acting and safe local anaesthetics are in increasing demand ,since number of day care surgeries are in rising trend. Lignocaine is the gold standard local anaesthetic in nerve blocks. To find an alternate to lignocaine is not a easy process but centbucridine, a novel drug comes close to properties of lignocaine. So this study was aimed to compare between Centbucridine and lignocaine in supraclavicular block performed using nerve stimulator.

In this study 60 patients were enrolled and they were randomly allocated with 30 in each group. Demographic data comparison showed that there is no statistically significant difference in terms of age, sex , weight of the population. The average time required for Onset of analgesia was 5.65 +/- 0.5 minutes and 5+/- 0.95 minutes with Centbucridine and Lignocaine groups respectively, the difference being statistically not significant. Similarly the average time required for onset of motor paralysis was 11.9+/- 1.75 minutes and 11.5+/-1.2 minutes with Centbucridine and Lignocaine respectively, the difference again being statistically insignificant. The mean total duration of sensory loss was 60.0 +/- 6.08 minutes and 70.50+/- 6.34 minutes with Centbucridine and Lignocaine respectively, the difference being significant statistically (Refer Table 6). The mean total duration of motor paralysis was 56.5+/- 3.88 minutes and 65.50 +/- 3.93 minutes with Centbucridine and Lignocaine respectively, the difference being significant statistically(Refer Table 7). Time of rescue analgesia that is VAS score >4 is also noted(Refer Table 8). There was only one patient in centbucridine group who developed vomiting that does not prove statistically significant when compared with lignocaine group.

6. Conclusion

When lignocaine and centbucridine are compared the onset of sensory and motor block being comparable and although the total duration of sensory and motor paralysis centbucridine produced good quality blockade comparable to lignocaine. Since the duration of motor blockade is comparatively shorter can be considered particularly in setting of day care surgeries. Hence centbucridine can be considered as an alternative local anesthetic of entirely different group.

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