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Comparison of effects of Dexmedetomidine and Clonidine as Adjuvants to Bupivacaine in Ultrasound Guided Supraclavicular Brachial Plexus Block

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Abstract: ***Background: Dexmedetomidine in comparison to Clonidine provides a longer duration of sensory and motor blockade as well as post-operative analgesia when used as an adjuvant to Bupivacaine in Supraclavicular Brachial plexus block. Methods: 50 patients of ASA1 and ASA2 physical status, aged between 18 to 70 years scheduled to undergo elective upper limb surgical procedures were randomly allocated into two groups of twenty five each. Group A received 0.5% Bupivacaine 20ML + 1mcg/kg Dexmedetomidine and group B received 0.5% Bupivacaine 20ML + 1mcg/kg Clonidine. The patients were monitored for intraoperative hemodynamics. Patients were assessed for the duration of sensory and motor blockade. Results: Onset of sensory blockade was found to be faster in Group A than in Group B, while onset of motor blockade occurred faster in Group B than in Group A, but the difference was not statistically significant (P>0.05). Duration of sensory block was 220.12 ±50.3 min in Group B as compared with 410.34± 60.12 min in Group A. Duration of sensory block was significantly longer in Group A as compared to Group B (P<0.01). The duration of motor block was 280.1± 20.12 min in Group B as compared with 460.4± 50.56 min in Group A. Duration of motor block was also significantly longer in Group A as compared to Group B (P<0.01). Duration of analgesia was significantly increased in Group A (452.7 ±64.23 min) as compared with Group B (270.4± 56.7 min(P<0.01). Conclusion: Dexmedetomidine and Clonidine can be used safely in combination with local anaesthetic in peripheral nerve blocks. However, Dexmedetomidine in comparison to Clonidine provides a longer duration of sensory and motor blockade as well as post-operative analgesia when used as an adjuvant to Bupivacaine in Supraclavicular Brachial plexus block.***

Keywords: Bupivacaine, Dexmedetomidine, Clonidine, Supraclavicular Brachial plexus Block, Ultrasound Guidance.

1. Aim of the Study

To compare the effects of Dexmedetomidine and Clonidine as Adjuvants to Bupivacaine in Supraclavicular Brachial Plexus Block.

2. Objectives

To compare;

a) Onset of sensory and motor blockade.
b) Duration of sensory and motor blockade.
c) Duration of analgesia.
d) Hemodynamic parameters (Pulse Rate, Blood Pressure, Spo2).

Methods

50 patients of ASA1 and ASA2 physical status, aged between 18 to 70 years scheduled to undergo elective upper limb surgical procedures will be randomly allocated into two groups of twenty five each.

a) Group A- Will receive 0.5% Bupivacaine 20ML + 1mcg/kg Dexmedetomidine.
b) Group B- Will receive 0.5% Bupivacaine 20ML + 1mcg/kg Clonidine.

3. Methodology

After obtaining approval and clearance from the ethical committee of the institution, patients fulfilling the inclusion criteria will be enrolled for the proposed study and informed written consent will be taken.

Group A will receive Bupivacaine 0.5% 20ML + Dexmedetomididne 1mcg/kg. Group B will receive Bupivacaine 0.5% 20ML + Clonidine 1mcg/kg. All the patients will be given tablet Alprazolam 0.5mg and Tablet Ranitidine 150mg orally to be taken on the previous night of proposed surgery. Patients were also advised to be nil orally from 10PM onwards on the night before surgery.

On the day of surgery all the arrangements for administering Supraclavicular Block using Ultrasound will be made. Alternatively, arrangements for general anaesthesia will also be made in case of inadequacy or failure of block.

After the patient is shifted inside the OT, non-invasive monitors will be connected for recording heart rate, NIBP, Spo2,ECG and baseline values will be recorded. With the patient lying in supine position, under aseptic conditions and Ultrasound guidance, Brachial plexus will be visualised and drug is injected using plane method. Testing for onset of sensory blockade will be made using pin prick method every minute till the patient feels no pain to pin prick. Motor blockade is assessed using modified bromagescale. After completion of surgical procedure patient will be assessed for the duration of sensory and motor blockade. Sensory blockade will be assessed on VAS scoring system. Cessation of analgesia is taken at the time when patient asks for rescue analgesia. Results will be recorded using pre-setproforma and any adverse effect during the procedure will be noted and treated accordingly.

4. Results

Onset of sensory blockade was found to be faster in Group A than in Group B, while onset of motor blockade occurred faster in Group B than in Group A, but the difference was not statistically significant (P>0.05). Duration of sensory block was 220.12 ±50.3 min in Group B as compared with 410.34± 60.12 min in Group A. Duration of sensory block was significantly longer in Group A as compared to Group B (P<0.01).The duration of motor block was 280.1± 20.12 min in Group B as compared with 460.4± 50.56 min in Group A. Duration of motor block was also significantly longer in Group A as compared to Group B (P<0.01). Duration of analgesia was significantly increased in Group A (452.7 ±64.23 min) as compared with Group B (270.4± 56.7 min (P<*0.01*). No side-effects (nausea, vomiting, dry mouth) were reported in the post-operative period in both the groups during the first 24 h.

Variables	Group A (mean ±SD)	Group B (mean ±SD)	P value
Onset time to sensory block (mins)	1.9±1.34	2.1±1.25	>0.05
Onset time to motor block (mins)	4.4±1.5	4.0±1.7	>0.05
Duration of sensory block (mins)	410.34±60.12	220.12±50.3	<0.01
Duration of motor block (mins)	460.4±50.56	280.1±20.12	<0.01
Duration of analgesia (mins)	452.7±64.23	270.4±56.7	<0.01

5. Discussion

Brachial plexus blocks are effective in providing both adequate intraoperative conditions as well as postoperative analgesia in upper limb surgeries. Recent introduction of Ultrasound guidance has established its effectiveness and safety and revolutionised the practice of peripheral nerve blocks. It has improved the safety along with marked reduction in the dose of local anaesthetics and adjuvants. USG helped us in visualizing the nerve roots and depositing the drug at the plexus.Plain bupivacaine can hardly provide analgesia beyond 3-8 hours following a peripheral nerve block. When Dexmedetomidine and Clonidine used as adjuvants, it was found that there was a significantly increased duration of sensory and motor blockade in the dexmedetomidine group than in the clonidine group without any adverse effects.

6. Conclusion

Dexmedetomidine and Clonidine can be used safely in combination with local anaesthetic in peripheral nerve blocks. However, Dexmedetomidine in comparison to Clonidine provides a longer duration of sensory and motor blockade as well as post-operative analgesia when used as an adjuvant to Bupivacaine in Supraclavicular Brachial plexus block.

References

[1] Snell RS. Clinical anatomy by regions. 9th Edn. Philadelphia: Lippincott Williams & Wilkins; 2012.
[2] Marhofer P, Greher M, Kapral S. Ultrasound guidance in regional anaesthesia. Br J Anaesth. 2005; 94: 7-17.
[3] Williams SR, Chovinard P, Arcand G, Harris P, Ruel M, Boudreault D, et al. Ultrasound guidance speeds execution and improves the quality of supraclavicular block. AnesthAnalg. 2003; 97: 1518-1523.
[4] Collin VJ. Local anesthetics. 3rd Edn. In: Principles of Anesthesiology. Philadelphia: Lea and Febiger. 1993.
[5] Gerlach AT, Dasta JF. Dexmedetomidine an uptadated review. Ann Pharmacother. 2007; 41: 245-252.
[6] Helmut Stähleet al: A historical perspective: development of clonidine. Clinical anesthesiology, June 2000;14(2):237-46.