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Original Research Article

TO STUDY THE EFFECT OF DEXAMETHASONE TO LOCAL ANAESTHETIC AGENT IN SUPRA CLAVICULAR BRACHIAL PLEXUS BLOCK DURATION OF ANALGESIA & SIDE EFFECTS

Dr. Kannam Peddulu[1] (Associate Professor)

Dept. Anaesthesiology, Amaltas Institute of Medical Sciences, Dewas[1]

Corresponding Author: Dr. Kannam Peddulu

Abstract

Background & Methods: The aim of the study is to study the Effect of Dexamethasone to Local Anaesthetic agent in Supra clavicular Brachial plexus block Duration of analgesia & side effects. All the patients underwent thorough preanaesthetic evaluation on the day prior to surgery. All systems were examined including airway and the surface anatomy where the block was going to be given. The anaesthetic procedure to be carried out was explained. Patients were reassured to alleviate their anxieties.

Results: The average duration of analgesia were 4.27±0.13hrs and 15.84.±0.29hrs in groups A and B respectively, showed statistical significance, the group B showed prolonged analgesia produced by addition of dexamethasone to local anaesthetics.

Conclusion: It is concluded from study that side effects & duration of analgesia number of analgesics required are concerned dexamethasone group appeared to be better than the other group.

Keywords: dexamethasone, anaesthetic, clavicular, brachial

Study Design: Observational Study.

1. Introduction

Brachial plexus provides the motor innervation and nearly all sensory supply of the upper limb. The plexus is formed by the anterior primary rami of fifth, sixth, seventh, eighth cervical and first thoracic nerves. Sometimes the plexus is derived mainly from fourth to eighth cervical nerve (prefixed plexus) or from sixth cervical nerve to second thoracic nerves (post fixed plexus). The components are designated according to their location as roots, trunks, divisions, cords and branches. Roots after emerging from intervertabral foramina unite to form trunks between scalene muscles. Each trunk divides into anterior and posterior divisions. The divisions in combination form cords which surrounds the axillary artery.

Each peripheral nerve consists of both afferent and efferent axons. A typical nerve consists of several axonal bundles or fascicles. Endoneurium is the connective tissue covering of the axons and it permits easy diffusion of local anaesthetics. Each fascicle of axons is encased by

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a squamous cellular sheath, the perineurium, which comprises of several layers of cells and acts as a semi permeable barrier to local anaesthetics.

Each peripheral nerve axon possesses its own cell membrane called axolemma. Non myelinated nerve fibers such as autonomic postganglionic and nociceptive afferent C fibers are encased in a single schwann cell sheath. Most large motor and sensory fibers are enclosed in many layers of myelin which consists of plasma membranes of specialized schwann cells that wrap themselves around the axon during axonal growth. Myelin greatly enhances the speed of conduction by insulating the axolemma from the surrounding conducting salt medium and forcing the action current to flow through the axoplasm of nodes of Ranvier, which are periodic interruptions in the myelin sheath where the action currents are regenerated. The sodium channels that serve impulse generation and propagation are highly concentrated at the nodes of Ranvier of myelinated nerve fibers.

2. Material and Methods

The present study was conducted at Osmania M. C. & MNJ Cancer Hospital, Hyderabad for 01 year on 40 patients. All the patients underwent thorough preanaesthetic evaluation on the day prior to surgery. All systems were examined including airway and the surface anatomy where the block was going to be given. The anaesthetic procedure to be carried out was explained. Patients were reassured to alleviate their anxieties. A written informed consent was taken. They were educated regarding the visual analogue scale. All the patients were fasted overnight. All of them received oral Alprazolam and tablet ranitidine 150mg night before the surgery.

Group A: Bupivacaine.

Group B: Dexamethasone.

Inclusion criteria:

- Male & female of both sex
- Patient height more than 150 cm
- Weight more than 55 kg.

Exclusion criteria:

- Patchy or inadequate Anaesthesia
- Diabetes / Glucose intolerance
- Peptic disease.
- Patients undergoing emergency surgical procedures.

3. Result

Table 1: Comparison of demographic parameters

Demographic parameters Mean ± SD	Group A (n=20)	Group B (n=20)	P value
Age in years	31.36±0.97	32.07±0.98	0.315
Weight in kg	59.48±1.62	62.69±1.48	
Sex	Male=15	Male=13	
	Female=05	Female=07	

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31.36. ±0.97 yrs in-group A and 32.07±0.98 yrs in-group B. The average weights of the patients were 59.48±1.62 kgs in-group A and 62.69 ±1.48 in-group B respectively. Both groups had predominantly male patients, accounting for nearly 2/3 of the total study population in each group. There was no significant difference in age, weight and sex distribution.

Table 2: Duration of Analgesia

Study Parameter	Group A		Group B		P Value
	Mean	SD	Mean	SD	
Duration of analgesia (hours)	4.27	0.13	15.84	0.29	<0.0001

The average duration of analgesia were 4.27±0.13hrs and 15.84.±0.29hrs in groups A and B respectively, showed statistical significance, the group B showed prolonged analgesia produced by addition of dexamethasone to local anaesthetics.

Table 3: Comparison of side effects between the two groups

Side Effects	Group A	Group B
Nausea	3 (10.0%)	3 (10.0%)
Vomiting	2 (6.7%)	1 (3.3%)
Numbness	1 (3.3%)	1 (3.3%)
No side effects	24 (80.0%)	25 (83.3%)

The observed parameters like nausea, vomiting and numbness were comparable in both groups without any significance.

4. Discussion

In their study position of needle was considered to be acceptable when distal motor response was observed with output current of less than/equal to 0.7mA where as in our study position of needle was considered to be acceptable when distal motor response was observed with output current of less than/equal to 0.5mA. So, deposition of local anaesthetic was closer in vicinity of brachial plexus, as well as presence of local anaesthetic with adrenaline admixture could be the explanation for prolonged analgesic effect of our study. Apart from this addition of 2 ml dexamethasone might have altered the concentration of local anesthetics of their study drug could be another possibility of less duration of analgesia in their study.

It has been also observed that addition of small amounts of dexamethasone to local anesthetics prolonged duration of analgesia after subcutaneous, intercostals blockade, intra-articular and epidurally. In few study it was observed that systemic administration of Dexamethasone reduced pain.

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Though actual mechanism of Dexamethasone in producing rapid block and prolonging duration of analgesia is not well understood but by reviewing various previous studies, the reason of prolongation of analgesia in our study could be due to local action of dexamethasone on nerve as well as systemic anti-inflammatory effect after being observed from peripheral site (BPB site) to systemic circulation. Other possibilities are alteration in channel of nerve cell thereby synergistic action with local anesthetics or, the action on corticosteroid receptor present in brain after being absorbed from periphery to systemic circulation.

5. Conclusion

It is concluded from study that side effects & duration of analgesia number of analgesics required are concerned dexamethasone group appeared to be better than the other group.

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