

# COMPARISON OF THE ONSET OF SENSORY BLOCK USING LIDOCAINE 1.5% WITH ADRENALINE OR LIDOCAINE 1.5% WITH ADRENALINE AND DEXAMETHASONE IN ULTRASOUND GUIDED AXILLARY NERVE BLOCK FOR BELOW ELBOW SURGERIES

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## ABSTRACT

**The aim:** To demonstrate the onset of dexamethasone when added to lidocaine in ultrasound regional axillary brachial block.

**Materials and methods:** 30 patients participated in this study in Al-wasity hospital from June 1st to December 1st 2019; all were of ASA I-II type, aged 18-65 years old. All patients were scheduled for upper limb below elbow surgery with peripheral nerve block. They were divided randomly in to 2 groups: Group A: received 20 ml of lidocaine 1.5% with adrenaline 1:200000; Group 2 : received 20 ml of lidocaine with adrenaline and dexamethasone 8 mg. There was no significant differences among the groups regarding the change in pulse rate, MAP and Oxygen saturation. The group B was faster than group A (p value < 0.001) in both the time of cold sensory block onset and pinprick sensory block onset at all dermatome (C5,C6,C7,C8,T1).

**Results:** A variety of adjuvants have been used with peripheral nerve block to decrease the onset time, improve block quality, and prolong analgesia. Steroids have been shown to be beneficial in improving block onset.

**Conclusions:** Adding dexamethasone to lidocaine enhanced the onset time of the block with no hemodynamic effect.

**KEY WORD:** Axillary nerve block, dexamethasone

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## INTRODUCTION

Regional anesthesia: techniques of abolishing pain using local anesthetic agents as opposed to general anesthesia [1].

Techniques include: [1]

- Topical anesthesia;
- Infiltration anesthesia;
- Peripheral nerve blocks: plexus and single nerve blocks;
- Central neuraxial blockade: epidural and spinal anesthesia;
- IVRA;
- Sympathetic nerve blocks;
- Others, e.g. interpleural analgesia.

Advantages of regional anesthesia: [1]

- Conscious patient, able to assist in positioning, and warn of adverse effects (e.g. in carotid endarterectomy and TURP);
- Good effect of postoperative analgesia;
- Reduction of certain postoperative complications, e.g. atelectasis.

Contraindications and risks: [2]

Patient cooperation and participation are key points to the success and safety of every regional anesthetic procedure; patients who are unable to remain still for a procedure may be exposed to increased risk. Examples include younger pediatric patients and some developmentally

delayed individuals, as well as patients with dementia or movement disorders [2].

Bleeding disorders and pharmacological anticoagulation heighten the risk of local hematoma or hemorrhage, and this risk must be balanced against the possible benefits of regional block [2].

## THE AIM

To demonstrate the onset of dexamethasone when added to lidocaine in ultrasound regional axillary brachial block.

## MATERIALS AND METHODS

30 patients participated in this study in Al-wasity hospital from June 1st to December 1st 2019; all were of ASA I-II type, aged 18-65 years old. All patients were scheduled for upper limb below elbow surgery with peripheral nerve block. They were divided randomly in to 2 groups: Group A: received 20 ml of lidocaine 1.5 % with adrenaline 1:200000; Group 2 : received 20 ml of lidocaine with adrenaline and dexamethasone 8 mg. There was no significant differences among the groups regarding the change in pulse rate, MAP and Oxygen saturation. The group B was faster than group A (p value < 0.001) in both the time of cold

**Table I.** Comparison of sensory block tested by thermogel between the groups

	Groups	N	Mean	Std. Deviation	Std. Error	P Value
Thermogel C5 (min)	A	15	14.00	1.07	0.28	< 0.001
	B	15	9.33	1.23	0.32	
Thermogel C6 (min)	A	15	15.33	2.09	0.54	< 0.001
	B	15	8.93	1.28	0.33	
Thermogel C7 (min)	A	15	16.27	1.83	0.47	< 0.001
	B	15	11.20	1.47	0.38	
Thermogel C8 (min)	A	15	18.67	2.35	0.61	< 0.001
	B	15	11.87	2.07	0.53	
Thermogel T1 (min)	A	15	19.33	2.09	0.54	< 0.001
	B	15	12.80	1.26	0.33	

**Table II.** Comparison of sensory block tested by pinprick between the groups

	Groups	N	Mean	Std. Deviation	Std. Error	P Value
Pinprick C5 (min)	A	15	16.13	1.19	0.31	< 0.001
	B	15	11.07	1.67	0.43	
Pinprick C6 (min)	A	15	16.93	1.98	0.51	< 0.001
	B	15	11.73	2.12	0.55	
Pinprick C7 (min)	A	15	18.00	1.85	0.48	< 0.001
	B	15	12.40	1.88	0.49	
Pinprick C8 (min)	A	15	20.27	1.98	0.51	< 0.001
	B	15	14.00	1.51	0.39	
Pinprick T1 (min)	A	15	21.33	2.23	0.57	< 0.001
	B	15	14.67	0.98	0.25	

sensory block onset and pinprick sensory block onset at all dermatome (C5,C6,C7,C8,T1).

Inclusion criteria:

- ASA type 1 and 2;
- Aging 18 to 65;
- Both sexes;
- Aimed for below elbow elective upper limb surgeries.

Exclusion criteria:

- Patient refusal;
- Any known allergy to the drugs studied;
- Coagulopathy;
- Local infection at site of injection;
- Pregnancy or lactation period;
- Hemodynamically unstable.

Group A: patients received 20 ml of 1.5% lidocaine with 1 : 200.000 adrenalin

Group B: patients received 20 ml mixture of 1.5% lidocaine with adrenaline 1:200000 and 8 mg dexamethasone

**Statistical analysis:**

- Simple randomized technique was used;
- T-test has been used to detect the correlation between two groups in hemodynamic parameter (Systolic , diastolic blood pressure , pulse rate and oxygen saturation ) , and for onset of loss of cold sensation and pain sensation;
- The correlation was significant when p value less than 0.05.

## RESULTS AND DISCUSSION

During the test of block success by cold touch the group B was significantly faster in onset to achieve the block the sensation by thermogel touch as compared with group A, p value in C5,C6,C7,C8,T1 was < 0.001 as shown in table I.

In the test of block successfulness by pinprick the group B was significantly faster in onset to achieve the block of sensation of pinprick as compared to group A, p value in C5,C6,C7,C8,T1 was < 0.001 as shown in table II.

This study was incompatible with Marhofer et al (Austria 2019). They studied the efficacy of dexamethasone in extending the duration of local anaesthetic block in Ultrasound-guided ulnar nerve blocks (ropivacaine 0.75% wt/vol, 3 ml, with saline 1 ml with or without dexamethasone 4 mg); it was performed on three occasions in 24 male volunteers grouped as control group with perineural injection and received i.v. saline; perineural group who received perineural dexamethasone and i.v. saline; i.v. group, who received perineural saline and i.v. dexamethasone. Sensory block was measured using a VAS in response to pinprick testing. The duration of sensory block was the primary outcome and time to onset of sensory block – the secondary[26]. Study has showed that there was no significant differences between group when adding dexamethasone to peripheral nerve block and this result may have occurred

due to less dose as the use 4 mg of dexamethasone compared to our study where 8 mg of dexamethasone were used [26].

## CONCLUSIONS

Adding dexamethasone to lidocaine enhances the onset time of the block with no hemodynamic effect.

## RECOMMENDATION

- We recommend the use of dexamethasone in peripheral nerve block to speed up the onset of block.
- Further study with much samples is recommended.

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### Conflict of interest:

The Authors declare no conflict of interest.

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