



EFFECTS OF NEO VITACAIN™ IN STELLATE GANGLION BLOCK

Tomoki Nishiyama*

Department of Anesthesiology, Kamakura Hospital, Kanagawa, Japan.

*Corresponding Author: Tomoki Nishiyama

Department of Anesthesiology, Kamakura Hospital, Kanagawa, Japan.

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ABSTRACT

The purpose of this study was to compare prospectively the effects of Neo Vitacain™ (dibucaine 5 mg (0.1%), sodium salicylate 15 mg (0.3%), and calcium bromide (0.2%)) with local anesthetics in stellate ganglion block (SGB). Thirty patients scheduled for stellate ganglion block for post herpetic neuralgia were enrolled. Fifteen patients received SGB with Neo Vitacain™ 5 mL for the first 5 times, then changed to the SGB with 1% lidocaine 5 mL for the next 5 times. Another 15 patients received SGB with 1% lidocaine 5 mL for the first 5 times, then changed to the SGB with Neo Vitacain™ 5 mL for the next 5 times. Blood pressure, heart rate, pain as assessed by the visual analog scale (VAS, 0 – 100) and appearance of Horner syndrome and hoarseness were compared between lidocaine and Neo Vitacain™. Blood pressure and heart rate did not change significantly with both Neo Vitacain™ and lidocaine. VAS score decreased without any differences between Neo Vitacain™ and lidocaine. The number of the Horner sign was smaller with Neo Vitacain™, but not statistically significant. The number of the hoarseness was significantly lower with Neo Vitacain™ than lidocaine. In conclusion, SGB with Neo Vitacain™ and lidocaine showed similar analgesic effects on post herpetic neuralgia and Neo Vitacain™ induced less hoarseness than lidocaine.

KEYWORDS: stellate ganglion block, dibucaine, sodium salicylate.

1. INTRODUCTION

Neo Vitacain™ (dibucaine 5 mg (0.1%), sodium salicylate 15 mg (0.3%), and calcium bromide (0.2%)) are included. Tanabe Mitsubishi, Osaka, Japan) is used for epidural block, peripheral nerve block, and local infiltration in Japan. The duration of analgesia prolongs with Neo Vitacain™ in comparison with local anesthetics in various kinds of blocks.^[1] However, their study^[1] was not prospective, and their patients already received blocks with local anesthetics and then changed to Neo Vitacain™. Therefore, their results did not really compare the effects of Neo Vitacain™ and local anesthetics in the same situation. Dibucaine and sodium salicylate are used worldwide, but Neo Vitacain™ is available only in Japan. Therefore, there are no studies of the effects of Neo Vitacain™ published in English. The purpose of this study was to compare prospectively the effects of Neo Vitacain™ with local anesthetics in stellate ganglion block (SGB), and report it in English.

2. MATERIALS AND METHODS

After the approval of the research committee of the hospital and informed consent from patients, 30 patients, 40 to 80 years with ASA physical status I or II, who were scheduled for SGB for post herpetic neuralgia, were enrolled in this study. Those who had allergy to the agents for the study or who had taken any analgesics

before this study were excluded.

Patients were randomly divided into two groups with 15 patients each. Fifteen patients received SGB with Neo Vitacain™ 5 mL for the first 5 times, then changed to the SGB with 1% lidocaine 5 mL for the next 5 times. Another 15 patients received SGB with 1% lidocaine 5 mL for the first 5 times, then changed to the SGB with Neo Vitacain™ 5 mL for the next 5 times.

Blood pressure, heart rate, pain as assessed by the visual analog scale (VAS, 0 – 100), and appearance of Horner syndrome and hoarseness were compared between lidocaine and Neo Vitacain™.

Power analysis was performed with the power of 0.90 and effect size of 0.30 using the G Power™ software (University Mannheim, Germany). Data were shown as mean ± standard deviation or number of the patients. Statistical analysis was performed with chi-square test for the number of Horner sign and hoarseness, and repeated measures analysis of variance (ANOVA) followed by Student-Newman-Keuls test for the measured parameters. A p value less than 0.05 was considered to be statistically significant.

3. RESULTS

The power analysis showed that total 26 patients were necessary. Therefore, we enrolled 30 patients. However, 4 patients were excluded because they did not finish the protocol.

Patients were 15 males and 11 females, 69 ± 10 years,

160 ± 11 cm in height, and 57 ± 9 kg in body weight. The days from the first symptom of herpes zoster to the start of the block was 198 ± 45 days.

Blood pressure and heart rate did not change significantly till 30 min. after the block in both Neo VitacainTM and lidocaine (Table 1).

Table 1. Blood pressure and heart rate

		0	10	20	30
Systolic blood pressure (mmHg)	Neo Vitacain	133 ± 16	135 ± 16	135 ± 16	135 ± 16
	Lidocaine	136 ± 15	138 ± 16	140 ± 17	139 ± 18
Heart rate (beats/min)	Neo Vitacain	81 ± 14	80 ± 12	79 ± 12	78 ± 12
	Lidocaine	82 ± 14	80 ± 13	78 ± 12	76 ± 12

Mean \pm standard deviation.

VAS score decreased significantly 30 min. after the block with both Neo VitacainTM and lidocaine, and no

difference was observed between Neo VitacainTM and lidocaine (Table 2).

Table 2. Pain

	Before SGB	30 min. after SGB
Neo Vitacain	66 ± 36	$31 \pm 26^*$
Lidocaine	70 ± 31	$39 \pm 28^*$

Pain was rated as visual analog scale (VAS) score 0 (no pain) to 100 (most severe pain).

Mean \pm standard deviation, SGB; stellate ganglion block *: $P < 0.05$ vs. the value before SGB.

The number of the Horner sign was smaller with Neo VitacainTM, but not statistically significant (Table 3). The

number of the hoarseness was significantly lower with Neo VitacainTM than lidocaine (Table 3).

Table 3. Side effects

	Horner sign		Hoarseness
	Block side	Non-block side	
Neo Vitacain	107	3 ⁺	19*
Lidocaine	123	4 ⁺	32

The numbers of the Horner sign or hoarseness were shown. Total number was 130.

*: $P < 0.05$ vs. Lidocaine, ⁺: $P < 0.05$ vs. Block side.

4. DISCUSSION

The present study showed that Neo VitacainTM and lidocaine showed similar analgesic effects on post herpetic neuralgia and Neo VitacainTM induced less hoarseness than lidocaine.

Dibucaine had been used for spinal anesthesia,^[2] but had not been used for SGB. In addition, we could not find any studies to compare the effects of dibucaine and lidocaine in any kinds of blocks.

Organic acid salts enhance anesthetic effects of local anesthetics.^[3] Sodium salicylate fastens the onset of analgesia, prolongs the duration of analgesia, and intensifies analgesic effects of dibucaine.^[4] Calcium bromide inhibits central excitation,^[4] which might have additive analgesic effects. Therefore, Neo VitacainTM is useful analgesic agent.

Neo VitacainTM induced longer duration of analgesic effects than mepivacaine or bupivacaine in 33% of the patients received trigger point block, epidural block, or

SGB in the study by Suzuki et al.^[1] The present study did not measure duration of analgesic effects, therefore, we could not confirm the results of the study by Suzuki et al.^[1]

Neo VitacainTM fastens to recover from herpes zoster pain and post herpetic pain.^[5] We could not follow long effects in the present study because our study design was cross-over study. Further study should compare the long effects of Neo VitacainTM and lidocaine in SGB.

Dibucaine had higher neurotoxicity than lidocaine with its clinically used concentration.^[6] However, Neo VitacainTM includes lower concentration of dibucaine than used as a single agent. Neo VitacainTM also induced axonal degeneration, which was reversible.^[4] Therefore, Neo VitacainTM is safer than dibucaine alone.

We could not find any reasons for less hoarseness with Neo VitacainTM than with lidocaine. Neo VitacainTM induced less Horner sign while statistically not significant. We speculate that lower concentration of

dibucaine in Neo Vitacain™ had lesser local anesthetic effect than lidocaine, therefore, hoarseness and Horner sign were less appeared. Sodium salicylate and calcium bromide intensified analgesic effects, thus analgesic effects were not different between Neo Vitacain™ and lidocaine.

5. CONCLUSION

SGB with Neo Vitacain™ and lidocaine showed similar analgesic effects on post herpetic neuralgia and Neo Vitacain™ induced less hoarseness than lidocaine.

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