Neurostimulation vs. Ultrasound guided interscalenic block for traumatic upper shoulder surgery – a prospective randomised trial assesing patient comfort and satisfaction

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Background

ISB is a common technique used for traumatic shoulder surgery
Interscalenic brachial plexus block (ISB) under neurostimulation (NS) is still commonly used, but is sometime recognised as uncomfortable with most patients identifying electrical stimulus as unplesant
Ultrasound (US) guided regional anesthesia does not require electrical stimulation and then should theoretically improve patient comfort.
Comparative data concerning the comfort of the patients during ISB placement are scarce
The aim of this study was to compare the patients comfort during ISB placement using NS and US (in plane) approaches

Material and Method

112 patients ASA I-III skeduled for shoulder surgery after a traumatic event.
Psychological preparation for the procedure
Prospectively randomised (using a table of random sampling numbers) enrolled in 2 groups: gr.NS=56 pts and gr.US=56pts
Premedication before ISB:

- Sufentanyl 0.1mcg/bw
- Propofol 0.2-0.5mg/bw at pts request for more comfort

Resque dose of sufentanyl 0.05-0.1 mcg/bw as needed
Exclusion criteria: patients<18 years, pregnant woman, contraindication of regional anesthesia, psychiatric, pulmonary and cardiac disease, drug dependents, coagulopathy, allergic to one of the medications used in the study, neurological deficits, local infection
Standard monitoring includedd BP, HR, SpO2. RR, T°
Senior experienced anesthesiologist performed the ISB in both groups
Before starting surgery each patient was asked to rate maximal pain intensity for anaesthetic technique using VAS
Patients comfort score (PCS) to evaluate satisfaction during ISB performance included three criteria: maximal intensity pain using VAS score (0-100) <30/100=1,>30/100=0; number of unpleseant events 0=1,>1=0; patients satisfaction: satisfied and very satisfied=1, accetable and unsatisfied=0
Primary endpoint: PCS evaluating the ISB performance
Secondary endpoint: time to perform ISB, complications, rate of success, aditional premedication.

Results

Demographics and surgical data			
Pts. data	Gr. NS	Gr. US	p
Gender (M/F)	29/27	33/24	0.56
Age (y)	35±14	34±16	0.65
W (kg)	67±15	63±18	0.63
H (cm)	156±15	158±14	0.55
ASA (I/II/III)	28/17/11	25/16/15	-
Surgery time (min)	120±26	111±15	0.63

Pacient´s perception

	Gr. NS	Gr. US	p
VAS	60(30-90)	40 (20-60)	0.05
Unpleseant event			
Cutaneous puncture	39	22	0.05
Needle progresion	31	28	0.55
LA injection	27	11	0.06
Electric stimuli	44	-	0.01

Pacient´s comfort evaluation

Aditonal premedication

Premedication	Gr.NS	Gr. US
Sufentanyl (mcg)	10±3.5	5±1.7
Propofol (mg)	20±5.2	8±2.4

ISB placement details

Discussion

A block was arbitrary defined as comfortable if it was placed with low pain intensity without perception of any unpleseant event, resulting in a patient either satisfied or very satisfied with the regional anesthetic technique
The reason for incresed pain intensity during NS are: depth of needle insertion blinded, duration of ISB placement affecting pain perception, number of needle passing
US technique is shorter with less pain, local anesthetic volume less
Study limitations: not blinded, PCS is not validate in the literature, no follow up for unnpelaned admissions.

Conclusion

This study demonstrate that US is less painful and more comfortable than NS placement ISB
Nerve stimulation is still a good techique for performing ISB but US may improve the efficiency (less need to manipulate needle)
ISB remains the mainstay for shoulder surgery, especial before surgery causing less postoperative pain
The most unpleasant event was considered the electrical stimuli