

Sensory block in Day Surgery



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Daniela Messineo^{***}, Paolo Izzo^{*}, Pier Francesco Di Cello^{**}, Sandro Spaziani Testa^{**},
Giulio Di Scala^{**}, Luciano Izzo^{*}
Collaboratori: Alessandro Monti^{***}, Giuseppe Marzio^{**}

^{*}Department of Surgery "Pietro Valdoni", Policlinico Umberto I, "Sapienza" University of Rome, Rome, Italy

^{**}Clinica Villa Gioia Sora, Frosinone, Italy

^{***}Department of Radiological, Oncological and Anatomico-pathological Sciences, Università degli studi "La Sapienza", Rome, Italy

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BACKGROUND: *The aim of our research is to evaluate the effectiveness of the spinal anesthesia versus Local Anesthesia within the context of Day Surgery.*

MATERIALS AND METHODS: *This study is a clinical trial. 140 patients were enrolled (60 female, 80 male). Some parameters have been evaluated with scales ASA, Bromage Scale, Hollmen Scale, Numerical Rate Scale, and Patient Satisfaction that are now internationally recognized as valid to assess both the degree of anesthesia and the patient benefit.*

RESULTS: *Data is mostly matching between the two groups, even though there are some differences. Every patient from the group SUB underwent a single sensory block due to the fact that everyone had a Bromage Score under 2 and Hollmen score between 2 and 3*

CONCLUSIONS: *Results showed the versatility of the SUB blockage in a Acute postoperative pain is associated to the surgical treatment and is still today unavoidable. We always tried to keep in check or even avoid the pain, thinking it is useless and ethically unacceptable. It is considered dangerous since it starts neurovegetative and neuroendocrinal cascade which lead to delayed functional and psychophysical recoverywider population, compared to the LAs, the better surgical planning, but mostly a better analgesia over the following 24 hours and a better satisfaction. Despite all these findings the patients continue to prefer the local anesthesia.*

KEY WORDS: Analgesia, Epidural, Post-operative, Ultrasound.

Introduction

Day Surgery, also known as Outpatient Surgery, is an organization model procedure that allows to perform surgery and or diagnostic procedures limited to only some hours of the day, and can be accomplished through various anesthetic regimens, such as local anesthesia or

central nerve blockade. This way the discomfort of the hospitalization is limited to the minimum and the patients can return to their houses much quicker ¹.

Local Anesthetics (LAs) allow the discharge from the hospital the same day as the hospitalization, due to their temporary action over the neural conductivity which blocks both the pain/touch and motor function. LAs belong to one of two classes, aminoamides and aminoesters, and are used at specific concentrations achieving only analgesia and not paralysis. The absorption of LAs happens mostly in the site of injection, which is also where the first reactions for elimination happen, allowing a fast catabolism. Factors that play a role in their absorption are multiple, such as: conditions of the area where they are injected, doses, pharmacody-

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Correspondence to: Prof. Luciano Izzo, General Surgery Unit, P. Valdoni Department, University of Rome "La Sapienza" Viale del Policlinico 150, 00161 Roma, Italy (e-mail: luciano.izzo@uniroma1.it)

namics of the anesthetics, administration at the same time as vasoconstrictors and characteristics of the patient. Duration of action varies according to the systemic absorption and the individual LAs.

LAs are weak bases which influence various cellular metabolic pathways implied in the transmission of the pain, such as those regulated by MAPK, G protein-coupled receptors and NMDA. Even though they usually interfere with other organs (e.g. heart), their low bioavailability reduces side effects ².

Local anesthesia is limited mostly to the area of injection, being able to block only the surgical site, on the other hand regional anesthesia (e.g. spinal or epidural) is not, being therefore more inaccurate.

The aim of our research is to evaluate the effectiveness of the spinal anesthesia (Subarachnoid block, SUB) versus Local Anesthesia within the context of Day Surgery.

Material and Methods

This study is a clinical trial. 140 patients were enrolled (60 female, 80 male, average age $57,5 \pm 0,5$). Patients in order to be enrolled had to satisfy all the following criteria: belonging to either ASA Physical Status Classification System 1 or 2³; having age over 20 years; undergoing surgery to treat inguinal hernia, anal fissures, abscess of the glutei, phimosis or sacrococcygeal fistulas, and skin neoformations in the lower limbs.

Patients with ASA 3 or 4, or with cardiac diseases (e.g. aortic stenosis), or patients treated with negative chronotropes, or patients with medical history of hypersensitivity to chosen medications were not included in the study.

We identified two groups: the first, which is composed of patients who underwent the surgery with a subarachnoid block (SUB Group) and the second with Local Anesthesia (LA Group).

The SUB group is made of 72 patients treated with the following protocol: bupivacaine 0.08% + sufentanil 7 mcg + clonidine 20 mcg.

The LA group is made of 68 patients treated with the following protocol: Carbocaine® (mepivacaine hydrochloride) 7 mg/Kg.

The patients were evaluated for the following parameters: Hemodynamics (Mean Arterial Pressure MAP, Heart Rate HR), pain perception (Numerical pain Rating Scale NRS), PONV (post-operative nausea and vomiting), motor and sensory abilities.

Bromage Scale: the ability to move the lower extremities is assessed (0 = free movement, 1 = inability to extend knees, 2 = inability to flex knees, 3 = inability to move legs or knees)⁴.

Hollmen Scale: the residual sensory block is assessed through the pin prick test evaluating for the ability to perceive touch (0 = ability to determine that the pin prick is sharp, 1 = ability to determine that the pin

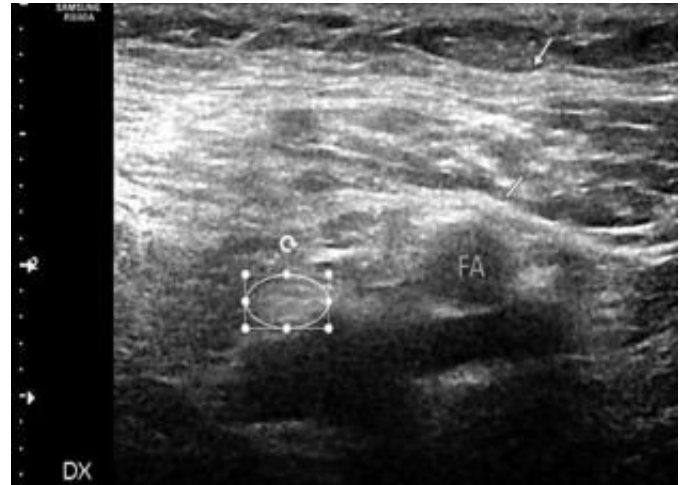


Fig. 1: Ultrasound scan performed on the axial plane in the right inguinal region: in the yellow circle is visible the femoral nerve, the yellow arrow indicates the fasciae latae, the green arrow points to the iliac band and, AF indicates the femoral artery.

prick is between sharp and dull, 2 = inability to recognize pin prick sharpness, 3 = inability to perceive the touch, i.e. anesthesia).

Numerical Rate Scale (NRS): the patients assessed the residual pain giving a score from 0 (i.e. no residual pain) to 10 (i.e. worst imaginable pain).

Patient Satisfaction after the surgery (from 0 to 10): the patients assess how much they are satisfied giving a score from 0 to 10.

From the LA Group 30 patients needed ultrasound to identify the nerve to block. We used an Aloka Arisetta 850 equipment with surface probe. The selected cases required femoral anesthesia. The identification of the femoral nerve with ultrasound is often facilitated by a slight cranial or caudal inclination of the transducer. Administration of anaesthesia for femoral nerve blockage results in anaesthesia of the anterior and medial thigh up to and including the knee, as well as a variable strip of skin on the leg and medial foot. It also innervates the hip, knee, and ankle joints (Fig. 1).

Post-operative analgesia: Paracetamol 1g for patients with NRS <5 and Ketorolac 30 mg if NRS >5.

Patients enrolled have given their consent for the processing of sensitive data and for the reporting of such data for research and study purposes.

Results

Data is mostly matching between the two groups, even though there are some differences. Every patient from the group SUB underwent a single sensory block due to the fact that everyone had a Bromage Score under 2 (Table I) and Hollmen score between 2 and 3 (Table II).

In the SUB Group there was only a case of PONV

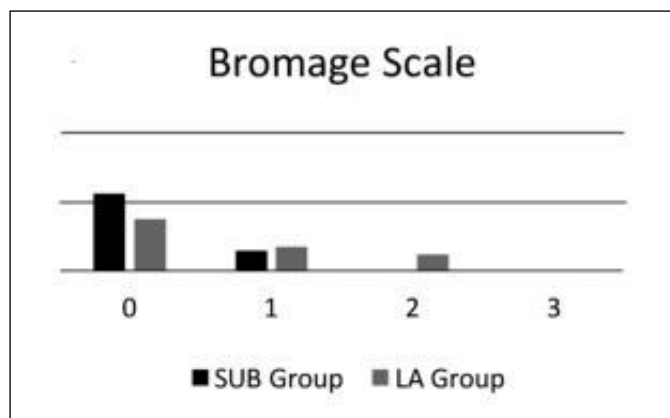


Table I

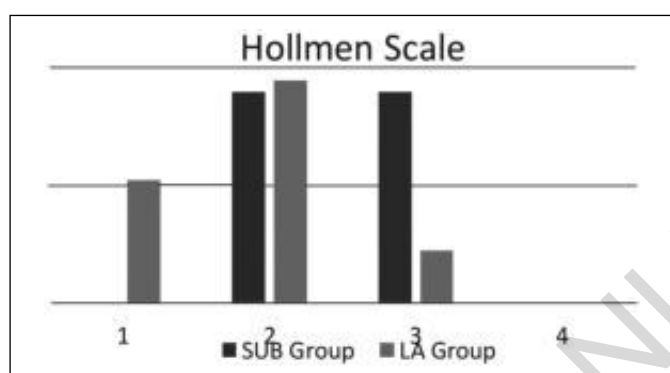


Table II

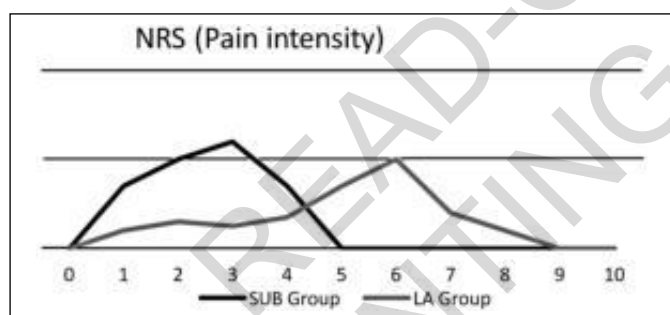


Table III

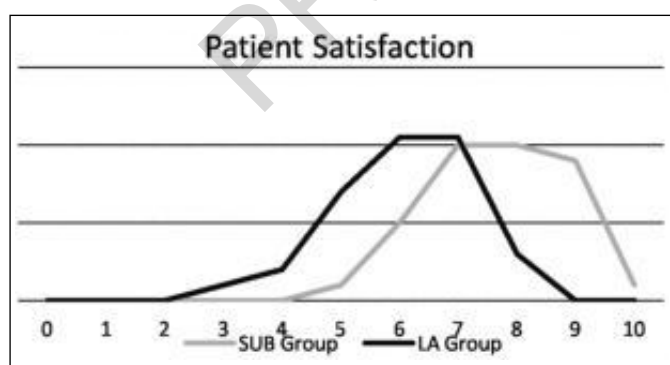


Table IV

treated with ondansetron 4 mg, 1 case of intra-operative bradycardia (HR of 40 bpm) treated with atropine 0,01 mg/Kg and 12 patients reported a NRS > 7 during the following 24 hours (Table III).

The Surgery Gain was higher in the SUB Group compared to the LA group (Table IV).

All patients who underwent ultrasound guided procedures had no local complications. 1 of the patients who did not needed more local injections.

Discussion

Acute postoperative pain is linked to the surgical treatment and is still today unavoidable. We always tried to keep in check or even avoid the pain, thinking it is useless and ethically unacceptable. It is considered dangerous since it starts neurovegetative and neuroendocrinal cascade which lead to delayed functional and psychophysical recovery.

The distinguished doctor Philip Raikes Bromage (1920-2013) introduced the homonym scale in order to optimize the local and regional anesthesia. Various changes have been proposed to the Bromage Scale, e.g. the usage of more grades. Breen et al., used indeed a 6 grades scale. The gain from these changes is a better evaluation of Bromage IV patients. Though we decided to use the first version of the Bromage Scale.

In the SUB Group a low dosage of sufentanil and clonidine was used due to the opinion of some Italian authors to be able to improve the pain management and reduce the incidence rate of post-operative hypotension. This last matter might improve the compliance of the departments for the management of the epidural catheter, having for this reason a reduction of the above mentioned post-operative pain ⁶.

The usage of the ultrasound guide showed, as already widely proved by other authors ⁷, that the optimal point for the injection of LAs are perineural sheaths, in order to grant a quick and steady analgetic effect.

During the post-operative procedure, paracetamol is contraindicated in patients with severe hepatic failure, albeit most patients can take up to 4 g/day without side effects. It is more important to be cautious in administering paracetamol in patients who are abstaining from eating, those who at the same time take isoniazid, zivoduvine, barbiturates or those who drink high amounts of alcohol. The dilution used was checked for it to be 100 ml/g.

Conclusions

Results showed the versatility of the SUB blockage in a wider population, compared to the LAs, the better surgical planning, but mostly a better analgesia over the following 24 hours and a better satisfaction. Despite all these findings the patients continue to prefer the local

anesthesia. The psychological implications of the usage of these two techniques should be further analyzed in order to explain the procedures in a better way and to opt for the best procedure for each individual patient.

Riassunto

Lo scopo Di questa ricerca è di valutare l'efficacia dell'anestesia spinale rispetto all'anestesia locale nel contesto della Day Surgery.

Si tratta di una sperimentazione clinica. Sono stati arruolati 140 pazienti (60 donne, 80 uomini). Alcuni parametri sono stati valutati con le scale ASA, Bromage Scale, Hollmen Scale, Numerical Rate Scale e Patient Satisfaction che ora sono riconosciute a livello internazionale come valide per valutare sia il grado di anestesia che i benefici per il paziente.

I dati dei risultati si riferiscono principalmente ai due gruppi, anche se ci sono alcune differenze. Ogni paziente del gruppo SUB ha subito un singolo blocco sensoriale perché tutti avevano un punteggio di Bromage inferiore a 2 e un punteggio di Hollmen compreso tra 2 e 3. Il dolore postoperatorio acuto è associato al trattamento chirurgico ed è ancora oggi inevitabile. Abbiamo sempre cercato di tenere sotto controllo o addirittura evitare il dolore, pensando che fosse inutile ed eticamente inaccettabile. È considerato pericoloso poiché inizia una cascata neurovegetativa e neuroendocrina che porta a un recupero funzionale e psicofisico ritardato.

I risultati di questo studio hanno dimostrato la versatilità del blocco SUB in una popolazione più ampia, rispetto alle LA, la migliore pianificazione chirurgica, ma soprattutto una migliore analgesia nelle successive 24 ore e una migliore soddisfazione. Nonostante tutti questi risultati, i pazienti continuano a preferire preliminarmente l'anestesia locale.

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