Opioid-sparing analgesia in Proximal Femur Fracture in ederly: a dose finding study.

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Introduction

Proximal femur fracture (PFF) is the most common orthopaedic emergency. It occurs mainly in ederly, due to low-intensity trauma. In Italy there were over 14 milion people over 65 in 2022 (23% of population) and the number is constantly increasing. In 2019 there were 94.645 surgical hospitalizations for this condition. Recent guidelines and good clinical practices suggest to employ pripheral nerve blocks in order to reduce opioids administration in ederly patients. Furthermore, ederly people are at increased risk of developing Local Anaesthetic Sistemic Toxicity (LAST) and the dose should be minimized. This study aims to investigate the lower concentration of 20 ml Levobupivacaine that provides analgesia when injected around femoral nerve under ultrasuound and ENS guidance.

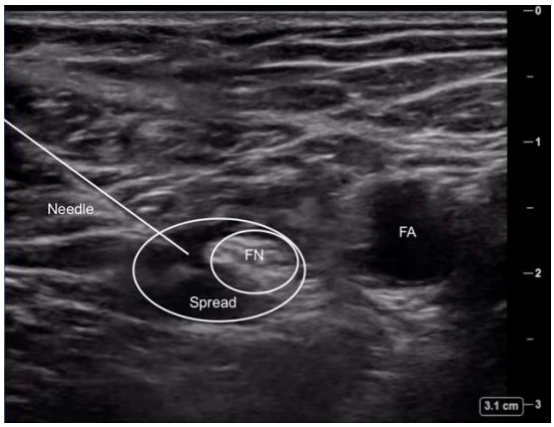


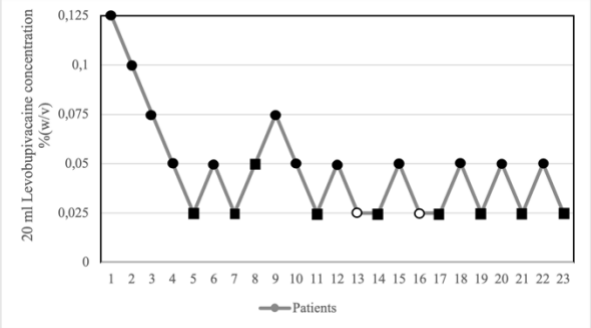
Figure 1. Femoral nerve block performed by ultrasound guidance. FN (Femoral nerve); FA (Femoral artery).

Materials and Methods

We used sequential up-down method: we increased the concentration of levobupivacaine if the preceding dose had been ineffective and decreased it if the preceding dose had been effective. The block was considered "effective" when resulted in a reduction of at least 3 point on NRS scale with reduced cold sensation, after 20 minutes. We enrolled 24 patients aged over 65, which rated a minimum score of 24 in MMSE. The block was performed preoperatively, regardless of the kind of anesthesia (general or subarachnoid), under ultrasound guidance (using SonoSite M-Turbo® Ultrasound System) and a perineural catheter was placed, using a Temena Poliplex USD 90® 18 G 90 mm needle, for the administration of rescue doses when the block resulted ineffective. If the perineural rescue dose was ineffective to manage postoperative pain, intravenous paracetamol 1 g was administered.

Results

The first patient recived 0,125% concentration and upwards and downwards variation were by 0,025%. 0,075% concentration was effective. 0,05% concentration resulted effective in 88,8% of cases. 0,025% concentration was ineffective. EC50, calculed by Hill equation, was 0,0425.



Graphic 1. Results after perineural injection of 20 ml of Levobupivacaine in different concentrations: effective (●), uneffective (■), equivocal (○).

Levobupivacaine concentration %(w/v)	Number of patients	20 minute rescue dose (uneffective)	6 h rescue dose	12 h rescue dose	24 h rescue dose	48 h rescue dose
0,125	1	/	/	/	1 (p)	/
0,1	1	/	/	1(p)	/	1 (iv)
0,075	2	/	1 (p)	1 (p)	2 (iv)	/
0,05	8	1	/	3 (p)	5 (p)	2 (iv)
0,025	8	8	/	6 (p)	2 (p)	4 (iv)

Table 1. 48-hours pain monitoring and need for rescue dose (p: perineural, iv: intravenous).

Conclusions

The concentration began to fluctuate around two values after four patients had been recruited, indicating that the stepping value was too large. It would be desirable the recruitment of a larger number of patients in order to reduce the stepping value to increase the accuracy of results.
All patients received adequate analgesia and opioid-free pain management.