ANALGESIC CONSUMPTION AFTER TOTAL KNEE REPLACEMENT (TKR) IN 11 EUROPEAN HOSPITALS PARTICIPATING IN THE PAIN-OUT PROJECT

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Background and aims

Pain after TKR is reported to be moderate to severe, regardless of the type of analgesia administered.

For this type of surgery, postoperative analgesia is often performed using peripheral nerve blocks (PNB) combined with systemic analgesia (SYS) with opioids ± non-opioids.

We compared systemic analgesic requirements in patients receiving analgesia with or without PNB, in order to establish the effectiveness of the treatments

Patients and methods

All Ethics Committees approved the protocol and patients gave informed consent. Participating site's names were coded to ensure anonymity.

Data was obtained from 924 patients of consenting age (range 18-92, mean 68.7±10.5 y.o.), on postoperative day 1. All patients underwent a TKR, coded as 81.54 in the ICD-9.

All patients completed a self-administered questionnaire containing 17 items on a NRS 0-10 related to pain, AE, and satisfaction; there were also 5 additional categorical questions (yes/no). In a different questionnaire demographic data and the characteristics of surgery, anaesthesia and analgesia were registered. Patient data was collected during 2010-2012.

In the study we compared worst pain and analgesic consumption in patients receiving SYS or PNB+SYS.

Student's t-test, Mann-Whitney's U test and ANOVA were used for the statistical analysis. P-value <0.05 was considered significant.

Results

Systemic analgesia was administered to 46.4% of patients, while systemic plus a peripheral nerve block (PNB+SYS) to 53.6%; there were no significant differences between the nº of patients that received or not a PNB for postoperative analgesia. PNB were: femoral in 26%, femoral+sciatic 26%, and only sciatic in 2% of the patients (Figure 1).

We observed statistically significant differences (p<0.001) on the percentage of use of PNB between hospitals. The range went from site nº116 where PNB were used in 91% of patients, to nº 83 where PNB were not used (Figure 2).

We assessed the worst pain (WP) in the first 24h post-surgery, in all participating hospitals. Significant differences were found between sites (p<0.001). The global mean value was 6.0±2.9, and median (interquartile range) 7(4-8). The hospital with better pain scores had a median of 5(2-8) and the worst site 9(8-10). Results shown in Figure 3.

Worst pain scores were compared in patients receiving a PNB+SYS with those treated with SYS analgesia only. Statistically significant differences were observed (p= 0.012) between groups when comparing either mean values (6.2±3.2 and 5.9±2.7 for SYS and SYS+PNB, respectively) or median scores (Figure 4). The differences do not seem to be clinically relevant.

Figure 1. Type of postoperative analgesia (%)

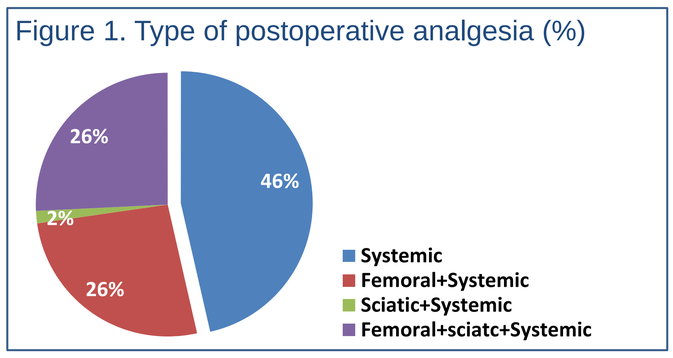
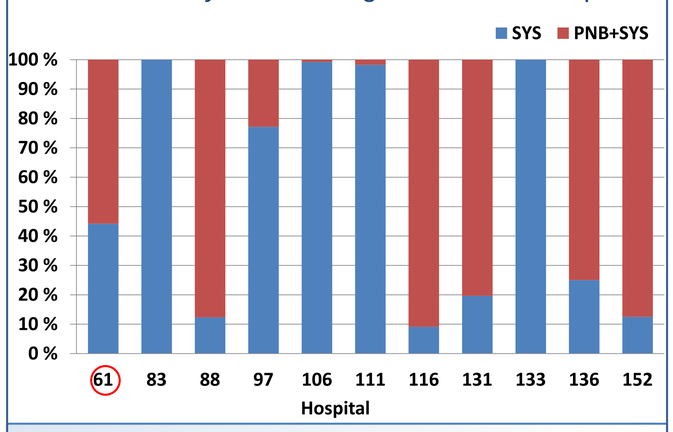
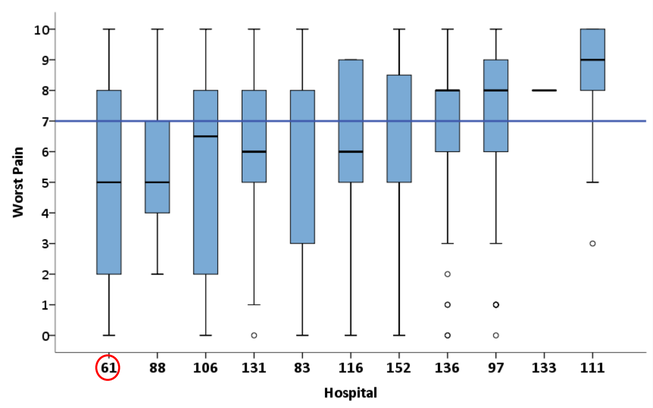


Figure 2. Patients (%) receiving peripheral nerve blocks and/or systemic analgesia at each hospital



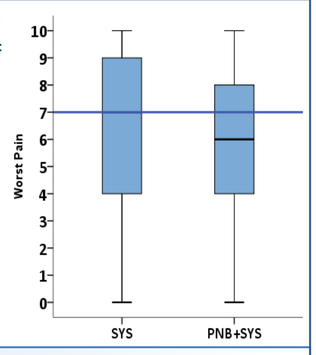
Bar chart with percentage (%) of patients receiving a SYS or PNB+SYS analgesia at each site. Results from Hospital del Mar highlighted in red.

Figure 3. Pain intensity 24 hours after surgery on the 11 participating hospitals



Box-plot representing median values for each site. Blue line represents the overall median value. Results from Hospital del Mar highlighted in red.

Figure 4. Worst pain related to type of analgesia



Box-plot representing median values and interquartile range for systemic (SYS) and SYS+PNB (peripheral nerve block) analgesia. Blue line represents the overall median value.

Table 1. Analgesic consumption according to type of analgesia

	SYS		PNB+SYS		p-value
	N	Mean dose ± SD	N	Mean dose ± SD	
Morphine	210	15.9±19.5	223	18.5±20.7	0.058
Oxycodone	137	11.1±6.2	33	10.9±7.2	0.618
Tramadol	72	184.8±104.9	91	177.7±103.5	0.610
Piritramide	35	17.1±10.9	102	18.9±13.5	0.435
Paracetamol	351	2948.5±1232.5	356	3172.4±1338.3	0.021
Ketoprofen	97	125.6±104.5	155	121.6±44.1	0.192
Metamizole	60	2410.8±1887.9	148	2685.8±1844.3	0.128
Diclofenac	43	122.7±67.4	97	133.1±62.6	0.273

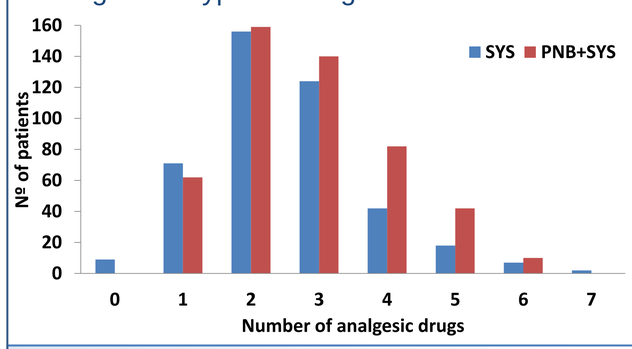
Results in mg/patient during post-operative day 1. SYS= systemic analgesia; PNB+SYS= Peripheral nerve block + SYS; N= number of patients receiving each drug. Mann-Whitney U test for comparison.

Systemic analgesic consumption was also assessed in the two groups (with and without PNB). Table 1 shows that mean requirements were similar in both groups, for opioids and non-opioids analgesics. When analyzing drug requirements individually, we observed that patients receiving a PNB required higher doses of paracetamol (p=0.021).

On average each patient received 2.7±1.2 different systemic analgesic drugs per day; this calculation does not include local anesthetics used for the PNB. Patients with SYS received 2.5±1.2, and PNB+SYS= 2.8±1.2 drugs/day. Although the differences were statistically significant (p<0.001), they were not clinically relevant (Figure 5).

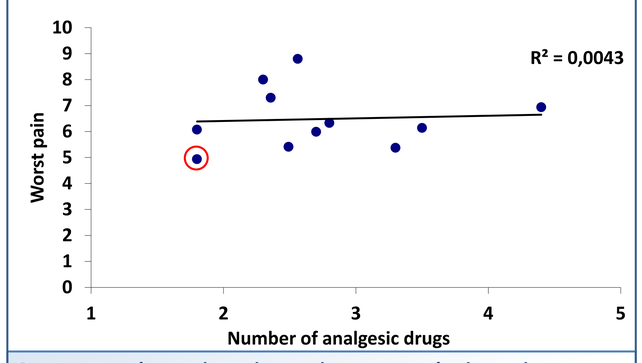
We assessed the correlation between the number of drugs and worst pain scores for each hospital (Figure 6). The number of analgesic drugs administered per hospital fluctuated between 1.8±0.8 and 4.4±1.1 (p<0.001). As stated before, worst pain scores also varied significantly between hospitals. There was no correlation between worst pain and the number of analgesic drugs used in each hospital (R^2=0,0043).

Figure 5. Number of different analgesic drugs relating to the type of analgesia



Bar chart representing the number of patients in relation to the number of drugs received in the course of each type of analgesia. SYS= Systemic analgesia, PNB+SYS= Peripheral nerve block+SYS.

Figure 6. Correlation between number of analgesic drugs/patient, and worst pain



Scatter plot showing the correlation between mean number of analgesics/patient and worst pain in each hospital and worst pain. Each hospital is represented by a blue dot. Results from Hospital del Mar highlighted in red.

Conclusions

- PNB were used in 54% of patients undergoing TKR, but the frequency differs greatly between hospitals (0 to 90%)
- Median value for worst pain was 7 (4-8). Pain scores varied largely between participating hospitals (range 5-9)
- Adding a PNB to systemic analgesia does not decrease worst pain in a clinically relevant way
- The number and dose of analgesics required was similar in patients with SYS or PNB+SYS analgesia, except for the dose of paracetamol that was higher in the PNB group
- Increasing the number of analgesics did not correlate with lower pain scores

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