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 to the 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 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.

Systemic analgesic consumption was also assessed in the two groups (with and without PNB). Table 1 shows that mean requirements of paracetamol (p=0.021) were statistically significant (p<0.001), they were not clinically relevant (Figure 5).

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 drug/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 analgesics drugs used in each hospital (R²=0.0043).

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

Table 1. Analgesic consumption according to type of analgesia

<table>
<thead>
<tr>
<th>Drug</th>
<th>SYS Mean dose ± SD</th>
<th>PNB+SYS Mean dose ± SD</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphine</td>
<td>210 15.9±19.5</td>
<td>223 18.5±20.7</td>
<td>0.058</td>
</tr>
<tr>
<td>Oxycodone</td>
<td>137 11.1±6.2</td>
<td>33 10.9±7.2</td>
<td>0.618</td>
</tr>
<tr>
<td>Tramadol</td>
<td>72 184.8±104.9</td>
<td>91 177.7±103.5</td>
<td>0.610</td>
</tr>
<tr>
<td>Piritramide</td>
<td>35 17.1±10.9</td>
<td>102 19.8±13.5</td>
<td>0.435</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>351 2948.5±1322.5</td>
<td>356 3172.4±1338.3</td>
<td>0.021</td>
</tr>
<tr>
<td>Ketoprofen</td>
<td>97 125.6±104.5</td>
<td>155 121.6±44.1</td>
<td>0.192</td>
</tr>
<tr>
<td>Metamizol</td>
<td>60 2410.8±1887.9</td>
<td>148 2685.8±1844.3</td>
<td>0.128</td>
</tr>
<tr>
<td>Diclofenac</td>
<td>43 122.7±67.4</td>
<td>97 133.1±52.6</td>
<td>0.273</td>
</tr>
</tbody>
</table>

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.

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