Identification of the most commonly prescribed opioid for administration by continuous subcutaneous infusion

Andrew Dickman

Marie Curie Palliative Care Institute Liverpool, University of Liverpool, United Kingdom

BACKGROUND

In palliative care, the mixing of two or more drugs together in a syringe for delivery by continuous subcutaneous infusion (CSI) is considered fundamental for continued symptom management when the oral route is no longer a viable option. Pain is one of the most frequently encountered symptoms in advanced disease. In all previous national surveys, diamorphine has been shown to be the opioid most commonly administered by CSI.

Medication safety is an important healthcare topic due to the prevalence and incidence of errors and the implications in terms of rising healthcare costs. Drug administration is seen as a common cause of medication error or failure, with mixing of incompatible parenteral drugs seen as an important medication error. Hence, compatibility and stability of drug combinations represent an issue of patient safety.

AIMS

To carry out a national survey in order to identify the opioid most commonly administered by CSI in order to:

(i) Inform local policy and practice

(ii) Guide future compatibility work

METHODS

UK pharmacists and pharmacy technicians were invited to complete an internet-based national survey of current practice. For each CSI, participants recorded information about constituent drugs, doses, diluent, total volume, duration of administration and visual appearance. A sub-analysis of the data was performed in order to identify the frequency of opioid prescribing. The results were compared with data from local practice, obtained from an earlier study.

RESULTS

Thirty five centres across the UK completed the study. The electronic database was locked once 2,000 entries had been received, although analysis of the data uncovers 199 void entries. Thus, a total of 1,801 CSIs were recorded. The survey revealed that a total of 26 different drugs were administered by CSI, of which 7 were opioids. Figure 1 displays the frequency that opioids appeared in the national database, while Table 1 lists mean and median doses.

Figure 1 – Frequency of opioids administered by CSI – national database

Table 1 – Mean and median doses of opioids – national database

<table>
<thead>
<tr>
<th>Opioid</th>
<th>Mean Dose (mg)</th>
<th>Median Dose (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphine</td>
<td>20</td>
<td>32</td>
</tr>
<tr>
<td>Oxycodone</td>
<td>30</td>
<td>53</td>
</tr>
<tr>
<td>Alfentanil</td>
<td>5</td>
<td>28</td>
</tr>
<tr>
<td>Diamorphine</td>
<td>30</td>
<td>85</td>
</tr>
<tr>
<td>Methadone</td>
<td>48</td>
<td>66</td>
</tr>
<tr>
<td>Hydromorphone</td>
<td>85</td>
<td>80</td>
</tr>
<tr>
<td>Buprenorphine</td>
<td>0.5</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Morphine was the most commonly prescribed opioid, occurring in 29.7% of CSIs. The median and mean doses of morphine sulphate infused over 24 hours were 20 mg and 32 mg respectively. Oxycodone was the second most frequently prescribed opioid, followed by alfentanil and diamorphine.

Analysis of local practice revealed that four opioids and 13 non-opioids had been prescribed. The most frequently used opioid was morphine, being present in 35.9% of recorded combinations. The median and mean doses of morphine sulphate infused over 24 hours were 15 mg and 23 mg respectively. Alfentanil was the second most commonly encountered opioid, followed by oxycodone and diamorphine. Figure 2 displays the frequency that opioids appeared in the local practice, while Table 2 lists mean and median doses.

DISCUSSION

Although the order of use was slightly different (Figures 1 and 2), both projects identified the same top four most-frequently used opioids. Morphine was the most commonly prescribed opioid for administration by CSI in combination with non-opioid drugs both nationally and locally. Diamorphine was the least commonly prescribed opioid identified by both projects. Previous surveys of UK practice do not corroborate the sequence of opioid choice demonstrated by national and local clinical practice. In fact, in previous surveys, diamorphine has been shown to be the opioid most commonly administered by CSI.(2,3,4)

There are several reasons that may explain why diamorphine is no longer considered the first-line choice for administration by CSI. The worldwide shortage of diamorphine during the winter of 2004 forced many services adopted morphine as the opioid of choice and it would appear that many have not reverted to diamorphine. In 2012, the National Institute for Health and Clinical Excellence recommended that the parenteral opioid with the lowest acquisition cost (i.e. morphine) should be used first-line.

The alternative opioids, oxycodone and alfentanil, are used more frequently than diamorphine. This is unsurprising given the similarities between morphine and diamorphine, the former being the drug of choice. Oxycodone has been available in the UK since 2001 and its place in treatment guidelines has increased. Both alfentanil and oxycodone are also recommended for use in patients with renal impairment.(5)

Diamorphine, with its superior solubility, appears to be generally reserved for patients with a relatively high opioid requirement, as reflected by mean and median doses of 81 mg and 10 mg (national) and 86 mg and 27.5 mg (local) respectively.

CONCLUSION

This project has identified morphine as the most frequently prescribed first-line opioid for administration by CSI in the UK. This information will help to inform local policy and practice, in addition to assisting with a planned chemical compatibility study.

REFERENCES

1. Dickman A. Continuous subcutaneous infusions – are we certain the patient is getting what we prescribe? The 5th World Congress on Pain (MAD), 2007


