The preparation and storage of anaesthetic drugs for obstetric emergencies: A SURVEY OF UK PRACTICE

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Introduction

Traditionally anaesthetic drugs for obstetrics are prepared as a contingency measure and stored until required for emergency use or until they 'expire' at a predetermined time. Expiry times are based on presumed reduction in sterility and efficacy, although the evidence base for this is controversial. Other risks associated with this practice include drug preparation errors and tampering. Wastage also has significant cost implications. We predicted practice regarding the preparation and storage of these drugs would differ widely across the UK and so we conducted a national survey.

Methods

In October 2007 a postal questionnaire was sent to the lead consultant obstetric anaesthetist at each of the 223 consultant-led obstetric units in the UK enquiring about the preparation of anaesthetic drugs for obstetric emergencies. The survey was approved by the OAA (survey number 75). Responses were anonymous.

Results

- 165 units responded (74%)
- 87% units routinely draw up emergency drugs (including vagolytics/vasopressors)
- 83% draw up an anesthetic induction agent - predominantly thiopental
- 83% draw up or use prefilled succinylcholine syringes
- 9% further units store ampoules and syringes together but don’t actually draw up drugs
- Prepared drugs are universally stored in a refrigerator
- Prepared drugs are universally stored in a refrigerator

**NDMR: non-depolarising muscle relaxant**

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Prepared by 136 units (82%)</th>
<th>Prepared by 136 units (82%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiopental</td>
<td>108 3 9 7 136</td>
<td>21 4 2 0 3</td>
</tr>
<tr>
<td>Propofol</td>
<td>108 3 9 7 136</td>
<td>21 4 2 0 3</td>
</tr>
<tr>
<td>Succinylcholine</td>
<td>100 10 1 17 8 136</td>
<td>35 4 2 0 4 3</td>
</tr>
<tr>
<td>Atropine</td>
<td>98 4 2 0 2 100</td>
<td>4 3 1 0 2 100</td>
</tr>
<tr>
<td>Glycopyrronium</td>
<td>97 3 4 0 0 98</td>
<td>4 3 1 0 2 100</td>
</tr>
<tr>
<td>Ephedrine</td>
<td>77 3 4 0 0 77</td>
<td>4 3 1 0 2 100</td>
</tr>
<tr>
<td>Oxytocin</td>
<td>14 3 0 0 0 14</td>
<td>0 0 0 0 0 14</td>
</tr>
</tbody>
</table>

- 83% of units routinely pre-preparing an anaesthetic induction agent for use in obstetrics
- 87% units routinely draw up emergency drugs (including vagolytics/vasopressors)
- 83% draw up an anesthetic induction agent - predominantly thiopental
- 83% draw up or use prefilled succinylcholine syringes
- Prepared drugs are universally stored in a refrigerator
- Prepared drugs are universally stored in a refrigerator

**Vagolytics:**

- Atropine: 98/165 units (97% prefilled)
- Glycopyrronium: 4/165 units (3 in addition to atropine, 1 alone)

**Vasopressors:**

- Ephedrine: 71/165 units (43%)
- Phenylephrine: 71/165 units (35% prefilled)
- Metaraminol: 2/165 units

- 10% (17) use prefilled syringes routinely
- 15% recommend hand washing
- 15% recommend wearing gloves
- 5% recommend cleaning ampoules before opening
- 41% units have written guidelines
- 59% units with trainees always give training; 11% never do

Discussion

24 hour drug renewal recommended by: Anesthesia Patient Safety Foundation (US) - NPSA (Promoting safer use of injectable medicines - March 2007)

But:

Several studies suggest risk of contamination is negligible, especially if prepared under aseptic conditions1-2; reduction in efficacy is also disputed3.

However:

Product characteristics for thiopental state it should be discarded after just 7 hours (Link Pharmaceuticals, West Sussex).

Cost Implications

In 2001 it was estimated that renewing these drugs was costing each hospital in the UK over £1200 per year, implying at least £270,000 per year across the UK as a whole.

Conclusion

- The majority of units draw up drugs and change them every 24 hours; this has a large cost implication
- The evidence for 24 hour changes is inconsistent and there is no evidence for impaired sterility up to 6 days if prepared under aseptic conditions; efficacy is also maintained
- The majority of units have potential for a third party to tamper with pre-prepared drugs
- Preparing multiple drugs increases the risk of drug error
- The use of prefilled syringes and pharmacy prepared drugs would eliminate concerns regarding efficacy and sterility, reduce wastage and potential for drug error and tampering by a third party

Recommendations

1. Widespread introduction of prefilled syringes for succinylcholine, vagolytics and vasopressors
2. Nationwide introduction of pharmacy prepared thiopental

References