Local warming of the hand and lower arm improved successful peripheral venous cannulation and reduced insertion time


QUESTION: Does local warming of the hand and lower arm facilitate insertion of peripheral venous cannulas?

Design
Randomised (allocation concealed), blinded (clinicians and outcome assessors) controlled trial and randomised (allocation concealed), blinded (clinicians and outcome assessors) crossover trial.

Setting
Neurosurgical unit and haematology ward of a university hospital in Vienna, Austria.

Active warming vs passive warming before insertion of peripheral venous cannulas (neurosurgical patients only)*

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Active warming</th>
<th>Passive warming</th>
<th>RBI (95% CI)</th>
<th>NNT (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Successful insertions on first attempt</td>
<td>94%</td>
<td>72%</td>
<td>31% (10 to 62)</td>
<td>5 (3 to 13)</td>
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</tbody>
</table>

*Abbreviations defined in glossary; RBI, NNT, and CI calculated from data in article.

COMMENTARY

Venous cannulation is a common procedure with a relatively high first time failure rate—one that would be unacceptable in other invasive procedures. Most practitioners could relate at least a few “horror” stories of patients with difficult access, and no doubt, more than a few patients view cannulation with some trepidation. When troubleshooting difficult peripheral intravenous access, the use of warmth in various forms is often invoked. A mitt, or warming device is electrically heated, insulation makes the likelihood of burns low if patients are relaxed their hands. One nurse anaesthetist attempted to insert an 18 gauge cannula into a vein on the back of the left hand.

In conducting a second study on patients receiving chemotherapy and confirming the results of the first study, Lenhardt et al, in 2 studies, offer the first evidence of the superior of this practice over standard insertion.

The designs of the studies were good. Randomisation was secure with an audit confirming the integrity of the allocation sequence. Loss to follow up was minimal. Efforts were made to blind the nurse anaesthetist and residents to group assignment; however, complete blinding was impossible due to the obvious change in hand temperature. Although some subjectivity exists in the method used to determine vein scores, outcomes such as time to insertion, number of failed first attempts, and skin temperature provide quantitative evidence of benefit.

It is clear that use of the Thermamed mitt increases skin temperature and reduces cannulation failure. With an NNT of 5 (95% CI 3 to 13) to obtain first attempt cannulation, the mitt could benefit many patients with little risk of adverse events. Although the device is electrically heated, insulation makes the likelihood of burns low if patients are conscious and peripheral sensation is intact. More careful monitoring may be required in patients with altered consciousness or sensation.

In its conducting a second study on patients receiving chemotherapy and confirming the results of the first study, Lenhardt et al verify the usefulness of the device in a subset of patients in which venous access is likely to be more difficult. For practical purposes, patients with difficult access may be most likely to benefit from purchase of this device. The question of whether the mitt is superior to other means of topical warming, such as warmed, moistened towels, remains unanswered. The results of such a comparison should be considered before institutions invest in the device for use with all patients.

Conclusion
Local warming of the hand and lower arm increased the rate of successful insertion of peripheral venous cannulas and reduced insertion time in neurosurgical patients and patients with leukaemia.