Internal jugular vein cannulation without the risk of double wall punctures

Dear Editor,

Ultrasound guidance does not always guarantee a successful cannulation and lack of complications.\(^1\) Thus, an ultrasound of the internal jugular vein (IJV) with a maximum diameter of \(<7\) mm is associated with decreased cannulation success.\(^2\) The vein puncture with a small diameter may result in double wall punctures. As a consequence, the carotid artery injury, nerve, and pleura damages may result from double wall punctures.\(^3\) The valsalva maneuver and the trendelenburg position are considered to be well-known methods for increasing the size of the IJV. Application of these maneuvers in emergency medicine may be limited.

The cannulation method offered by us takes into account the presence of IJV respiratory excursion and individual anatomic features of vein location.\(^4\) It enables to perform an effective puncture of the vein with a small diameter (experimental group) even without the trendelenburg position [Table 1]. Preanalysis of the venipuncture angle by the formula \(\alpha = \arcsin (a/c)\), where \(a\) is the lowest value of a vein diameter, \(c\) is the longitudinal length of a needle bevel, provides full immersion of needle bevel into the vein lumen without the risk of double wall punctures. Angle calculation is helpful in case when IJV diameter is less than the longitudinal length of a needle bevel. The venipuncture at the moment of patient’s expiration enables to reduce the risk of double wall punctures at the expense of vein diameter increase at this moment and vein collapse exclusion.\(^5\) It is recommended to define an alternative vascular access with a maximum IJV diameter of \(<4\) mm.

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Nil.

Table 1: Failure and complication rates internal jugular vein cannulation

<table>
<thead>
<tr>
<th></th>
<th>Group 1</th>
<th></th>
<th>Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional methods</td>
<td>n=14</td>
<td>Experimental methods</td>
<td>n=17</td>
</tr>
<tr>
<td>Failure rate</td>
<td>5 (35%)</td>
<td>2 (12%)</td>
<td></td>
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<tr>
<td>Complication rate</td>
<td>4 (28.4%)</td>
<td>2 (12%)</td>
<td></td>
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<tr>
<td>Arterial fail puncture</td>
<td>3 (21.3%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>Local hematoma</td>
<td>1 (8%)</td>
<td>2 (12%)</td>
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</tbody>
</table>

Conflicts of interest
There are no conflicts of interest.

Anton Aleksandrovich Kasatkin, Aleksandr Livievich Urakov, Aleksei Valerianovich Shchegolev, Anna Raisovna Nigmatullina

Department of General and Clinical Pharmacology, Izhevsk State Medical Academy, Izhevsk, \*cos{Department of Anesthesiology and Intensive Care, Kirov Military Medical Academy, Saint-Petersburg, Russia}*

E-mail: ant-kasatkin@yandex.ru

REFERENCES


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