Rate of admissions and extrapolated number of admissions with venous air embolus or arterial air embolus to critical care in England, Wales and Northern Ireland

Questions

What were the number, extrapolated number and rate of admissions with a primary reason for admission of venous air embolus or arterial air embolus to adult, general critical care units in England, Wales and Northern Ireland participating in the Case Mix Programme from 1 April 2011 to 31 March 2012?

Background to the ICNARC Case Mix Programme

The Intensive Care National Audit & Research Centre (ICNARC) was established in 1994 on a two-year (1994-1995), pump-priming grant from the Department of Health (England) and Welsh Health Common Services Authority (Wales), ICNARC became an independent Registered Charity in July, 1994 (Registered Charity Number: 1039417).

ICNARC’s aim is to foster improvements in the organisation and practice of adult critical care (intensive and high dependency care) to improve patient care and outcomes. Towards achieving part of this aim, ICNARC coordinates a national, comparative audit of patient outcomes from adult, critical care units in England, Wales and Northern Ireland known as the Case Mix Programme (CMP). Currently, 92% of adult, general critical care units in England, Wales and Northern Ireland are participating in the CMP.

The CMP is a voluntary, performance assessment programme using high quality clinical data to facilitate local quality improvement through routine feedback of comparative outcomes and key quality indicators to clinicians/managers in adult critical care units.

The CMP recruits predominantly adult, general critical care units. Adult, general critical care units are defined as either standalone intensive care units (ICUs) or combined intensive care/high dependency units (ICU/HDUs). Participation in the CMP is entirely voluntary.
CMP specified data are recorded prospectively and abstracted retrospectively by trained data collectors according to precise rules and definitions - set out in the ICNARC Case Mix Programme Dataset Specification. Data collectors from each unit are trained prior to commencing data collection with retraining of existing staff, or training of new staff, also available. CMP training courses are held at least four times per year.

CMP specified data are collected on consecutive admissions to each participating critical care unit and are submitted to ICNARC quarterly. Data are validated locally, on data entry, and then undergo extensive central validation, for completeness, illogicalities and inconsistencies, with data validation reports returned to units for correction and/or confirmation. The validation process is repeated until all queries have been resolved and then the data are incorporated into the CMP Database (CMPD).

Participating units receive comparative data analysis reports on outcomes and key quality indicators, in which they can identify their own unit data and compare with all units participating in the CMP. In addition, staff at units can interrogate the CMPD by submitting analysis requests which are provided free-of-charge.

Data collected for the CMP include alphanumeric unit/admission identifiers, demographics (e.g. age, sex, ethnicity), case mix (e.g. acute severity, comorbidity, surgical status, reason for admission), outcome (e.g. unit/acute hospital survival) and activity (e.g. unit/acute hospital length of stay) for each admission to each critical care unit.

Available data for report

133,425 admissions to 205 critical care units
1 April 2011 – 31 March 2012

Selection of Cases

All admissions to adult, general critical care units (i.e. excluding admissions to specialist critical care units or standalone high dependency units) in England, Wales and Northern Ireland that were participating in the CMP from 1 April 2011 to 31 March 2012.

Methods

The extrapolated numbers of admissions in the given year was obtained by calculating the rate of admissions per year (number of observed admissions divided by proportion of the year for which data were collected) for each unit, averaging over the units, and multiplying by the total number of adult, general critical care units in England and Wales. This was assumed to be 222 units.
Definitions for variables included

The ICNARC Coding Method (ICM) is a 5-tiered hierarchical method specifically designed for coding reasons for admission to critical care. Primary reason for admission is mandated; however secondary reason for admission is optional, unless the patient was admitted following surgery. For the purposes of this analysis the following primary reasons for admission were included:
- Venous air embolus
- Arterial air embolus

Results

Table 1: Rate, actual number and extrapolated number of admissions with venous air embolus or arterial air embolus to CMP units in England, Wales and Northern Ireland, 1 April 2011 – 31 March 2012

<table>
<thead>
<tr>
<th></th>
<th>1 April 2011 – 31 March 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of admissions with venous air</td>
<td>6 (0.0) [133,425]</td>
</tr>
<tr>
<td>embolus or arterial air embolus, (%)</td>
<td></td>
</tr>
<tr>
<td>Extrapolated number of admissions</td>
<td>7 (0.0) [149,000]</td>
</tr>
<tr>
<td>with venous air embolus or arterial</td>
<td></td>
</tr>
<tr>
<td>air embolus, (%) [N]</td>
<td></td>
</tr>
<tr>
<td>Rate of admissions with venous air</td>
<td>4.5</td>
</tr>
<tr>
<td>embolus or arterial air embolus per</td>
<td></td>
</tr>
<tr>
<td>100,000 admissions</td>
<td></td>
</tr>
</tbody>
</table>

Acknowledgement

Please acknowledge the source of these data in all future presentations (oral and/or written), as follows:

“These data derive from the Case Mix Programme Database. The Case Mix Programme is the national, comparative audit of patient outcomes from adult critical care coordinated by the Intensive Care National Audit & Research Centre (ICNARC). These analyses are based on data for 133,425 admissions to 205 adult, general critical care units based in NHS hospitals geographically spread across England and Wales. For more information on the representativeness and quality of these data, please contact ICNARC.”