Perfomance of the MTBI Decision Rule for Early Discharge of Patients with Findings on CT: A Center-TBI Validation Study

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Aims/Objectives/Background GCS 13–15 patients with TBI identified by CT imaging are routinely admitted for observation in the UK. A small proportion of patients clinically deteriorate or require intervention. We previously derived a prognostic model and decision rule to identify low-risk patients with injuries on CT who could be safely discharged from the ED. Neither has been externally validated.

We aim to externally validate our empirically derived prognostic model and decision rule.

Methods/Design A cohort of initial GCS13-15 patients with injuries on CT was derived from the CENTER-TBI cohort study. CENTER-TBI recruited patients who underwent CT imaging for head trauma between December 2014 and 2017 at 63 centres across Europe and Israel. A composite outcome encompassing need for hospital admission was used, including: seizures, death, intubation, admission to ICU, neurosurgical intervention and neurological deterioration. Performance of the model was assessed by measures of discrimination and calibration. The sensitivity and specificity of the decision rule to the composite outcome was estimated at the discharge threshold.

Results/Conclusions 1047 of 4509 patients recruited to the CENTER-TBI study met the inclusion criteria. 25.5% (95% CI: 22.9% to 28.2%) clinically deteriorated and 20.2% (95% CI: 17.9% to 22.8%) underwent neurosurgery, died, or were intubated. The prognostic model had an estimated C-static of 0.81 and a calibration slope of 0.5. Our decision rule achieved 100% (95% CI: 97% to 100%) sensitivity and specificity of 4.7% (95% CI: 3.3% to 6.5%) to clinical deterioration. This would allow 3.5% of patients to be discharged-

Abstract 59 Table 1 Discrimination and calibration of mTBI prognostic model in CENTER TBI cohort

<table>
<thead>
<tr>
<th>Model performance</th>
<th>Value (averaged across imputations)</th>
<th>Recalibrated model performance</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-Statistic</td>
<td>0.81 (95% CI, 0.78 – 0.84)</td>
<td>C-Statistic</td>
<td>0.81</td>
</tr>
<tr>
<td>Calibration in the large (CTU)</td>
<td>-5</td>
<td>Calibration in the large (CTU)</td>
<td>0.0</td>
</tr>
<tr>
<td>Calibration slope</td>
<td>0.5</td>
<td>Calibration slope</td>
<td>1</td>
</tr>
<tr>
<td>Expected vs. observed (E:O)</td>
<td>3.3</td>
<td>Expected vs. observed (E:O)</td>
<td>1.0</td>
</tr>
</tbody>
</table>
none of whom deteriorated. The decision rule outperformed the BIG criteria, which is used to triage hospital admissions in the USA.

External validation shows our decision rule may be safe for routine use in clinical practice. The inclusion of biomarkers or other novel factors may improve the calibration of the model and the specificity of the decision rule.

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156 PREHOSPITAL DETERMINANTS OF SUCCESSFUL RESUSCITATION AFTER TRAUMATIC AND NON-TRAUMATIC OUT-OF-HOSPITAL CARDIAC ARREST

Aims/Objectives/Background Out-of-hospital cardiac arrest (OHCA) is prevalent in the UK. Reported survival is lower than in countries with comparable healthcare systems; a better understanding of outcome determinants may identify areas for improvement. Aim: to compare differential determinants of survival to hospital admission and survival to hospital discharge for traumatic (TCA) and non-traumatic cardiac arrest (NTCA).

Methods/Design An analysis of 9109 OHCA in East of England between 1 January 2015 and 31 July 2017. Univariate descriptive and multivariable analysis were used to understand the determinants of survival for NTCA and TCA. Two Utest outcome variables were used: survival to hospital admission and hospital discharge. Data reported as number (percentage (95% CI)) and median (IQR) as appropriate. Continuous data have been analysed with a Mann-Whitney U test, and categorical data have been analysed with a χ2 test. Analyses were performed using the R statistical programming language.

Results/Conclusions The incidence of OHCA was 55.1 per 100 000 population/year. The overall survival to hospital admission was 27.6% (95% CI 26.7% to 28.6%) and the overall survival to discharge was 7.9% (95% CI 7.3% to 8.5%). Survival to hospital admission and survival to hospital discharge were both greater in the NTCA group compared with the TCA group: 27.9% vs 19.3% p=0.001, and 8.0% vs 3.8% p=0.012 respectively.

Determinants of NTCA and TCA survival were different, and varied according to the outcome examined. In NTCA, bystander cardiopulmonary resuscitation (CPR) was associated with survival at discharge but not at admission, and the likelihood of bystander-CPR was dependent on geographical socioeconomic status.

NTCA and TCA are clinically distinct entities with different predictors for outcome and should be reported separately. Determinants of survival to hospital admission and discharge differ in a way that likely reflects the determinants of neurological injury. Bystander CPR public engagement may be best focused in more deprived areas.