Ireland. According to OECD figures a motorcyclist is two to three times more likely to be killed in Ireland than on the continent. However, models derived from a given dataset are not reliably generalisable to other populations due to changes in trauma care systems/protocols regionally or over-time.

Aim: To construct prognostic models in TBI applicable to British patients and recent changes in TBI management.

Method: Records of patients with brain injury since January 2005 were extracted from the Trauma Audit and Research Network (TARN) database. TARN holds the records of patients with severe injuries, i.e. longer than 3 days stay at hospital, inter-hospital transfer, critical care in hospital or death. Following a literature review, the covariates age, cause of injury, GCS, pupillary reactivity, Injury Severity Score (ISS), CT classifications, systolic and mean blood pressure, hypoxia and the presence of extracranial injury were tested with survival at discharge as outcome. Covariates with no significant correlation on univariate analysis were excluded. Multiple logistic regression analysis was performed with split sampling for internal validation.

Results: Two models were derived on 802 patients with significant brain injury (models A and B). Age, GCS, pupillary reactivity, hypoxia and brain stem haemorrhage are significant predictors in both. However, model A contains ISS and brain swelling in contrast to model B with the presence of major extracranial injury, i.e. AIS >3 instead. Both models have acceptable discrimination and calibration strength (Model A; area under the ROC curve (AUC) = 0.92 (95% CI: 0.89–0.94) and HL test: P value = 0.32. Model B; AUC = 0.92 (0.90–0.95) and HL test: P value = 0.32).

Conclusion: We have developed two prognostic models applicable to the patients hospitalised after traumatic brain injury in England and Wales.

Keywords: Traumatic brain injury; Prognosis; Outcome; Logistic regression

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6A.8

Definitive major fracture surgery after damage control and in isolated injuries—A pragmatic approach to timing is safe

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The timing of definitive fracture surgery after major trauma remains a problem. When Damage Control Surgery (DCS) is required for life threatening trauma, our unit employs a pragmatic approach in timing definitive surgery. This is undertaken when the patients’ clinical condition is judged to be satisfactory, usually when approaching weaning from ventilation. Previous data implies such surgery may result in a significant ‘second hit’ if executed too soon (<5 days) after admission and DCS.

The response to definitive fracture surgery in adult major trauma patients requiring DCS (MT ISS >25, n = 11) with fractures of the femoral shaft, pelvis or acetabulum were studied in comparison to patients with those fractures in isolation (IF n = 21) and uninjured surgical controls (SC n = 12) undergoing similar surgery.

IL-8, IL-6 and sIL-6R levels, neutrophil CD11b and monocyte HLA-DR expression were studied at admission, preoperatively and days 2 and 5 post-operatively. The MT and IF patients were divided into those undergoing definitive surgery within the first 5 days of admission (MT1st 5 and IF1st 5) or later (MTL and IFL).

IL-8 levels were elevated in MT patients throughout the study period, whereas IL-6 levels were elevated but then declined steadily. The only post-operative rise observed was in IL-6 in SC patients. sIL-6R levels were increased in MT compared to IF patients post-surgery. CD11b expression was decreased on day 2 in both

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6A.7

Models of mortality probability in severe traumatic brain injury

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Background: Prognostic models in traumatic brain injury (TBI) are employed to design clinical trials, to assess/compare trauma care systems and to adjust trauma care for an individual patient. However, models derived from a given dataset are not reliably

Keywords: Light saving time; Road traffic collision injuries; Pedestrians; Fatal crashes

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6A.6

Motorcycle related neurotrauma in Ireland and the introduction of the SHARP programme

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Introduction: Motorcycles represent less than 2% of the licensed vehicles but motorcyclists account for 12% of road deaths in Ireland. According to OECD figures a motorcyclist is two to three times more likely to be killed in Ireland than on the continent. The most successful proven injury prevention method to reduce the severity of head injury and fatalities after a crash are motorcycle helmets.

The COST 327 European research brought together experts from across Europe to investigate in detail, motorcyclists’ head and neck injuries and recommend preventative strategies. In light these recommendatons the British Road Safety Authority has introduced the Sharp programme which hopes to save 50 lives in the UK each year alone by helping riders to choose the best fitting and safest helmets.

Methods: We evaluated the pattern of head injuries sustained by motorcyclists referred to the two neurosurgical centres Beaumont Hospital and Cork University Hospital in Ireland and ascertained if the new SHARP guidelines could be of benefit in reducing the burden of motorcycle related neurotrauma and disability in Ireland.

Results: Of the 62 patients registered 24% were not wearing helmets. Mild TBI (GCS 15–13) accounted for 40% of all new referrals, moderate TBI (12–9) 6% and severe TBI (8–3) 51%. CT brain imaging of patients: contusions 63%, subdural haemorrhages 15% traumatic subarachnoid haemorrhage 15%, extra-dural haemorrhages 4%, and skull fractures 27%. The mortality for the patients registered after a motorcycle accident was 18% (11 patients).

Conclusions: Despite Ireland having mandatory helmet laws almost a quarter of our motorcyclists with traumatic brain injury were unhelmeted. Extra-dural haemorrhages virtually eliminated by strict helmet laws in Italy affected four motorcyclists. Up to 20% reduction in mortality is predicted if all motorcyclists in Ireland were to wear helmets that satisfied the SHARP criteria.

Keywords: Neurotrauma; Motorcycle; Helmet

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