Clinical trials

Traumatic spinal cord injury (tSCI) represents a significant burden of illness, but is relatively uncommon and heterogeneous, making it challenging to achieve sufficient subject enrollment in clinical trials of therapeutic interventions for acute SCI.

The Rick Hansen Spinal Cord Injury Registry (RHSCIR) is a national SCI Registry that enters SCI patients from acute-care centers across Canada. To predict the feasibility of conducting clinical trials of acute SCI within Canada, we have applied the inclusion/exclusion criteria of six previously conducted SCI trials to the RHSCIR dataset and generated estimates of how many Canadian individuals would theoretically have been eligible for enrollment in these studies. Data for SCI cases were prospectively collected for RHSCIR at 18 acute and 13 rehabilitation sites across Canada. RHSCIR cases enrolled between 2009-2013 who met the following key criteria were included: non-penetrating traumatic SCI; received acute care at a RHSCIR site; age >18- <75 years, and had complete admission single neurological level of injury data. Inclusion and exclusion criteria for the Minocycline in Acute Spinal Cord injury (Minocycline), Riluzole, Surgical Timing in Acute Spinal Cord Injury Study (STASCIS), Cethrin, Nogo antibody study (NOGO) and Sygen studies were applied retrospectively to this dataset. The numbers of patients eligible for each clinical trial were determined. 2166 of the initial 2714 cases (79.8%) met the key criteria and were included in the dataset. Projected annual numbers of eligible patients for each trial was: Minocycline 117 cases; Riluzole 62 cases; STASCIS 109 cases; Cethrin 101 cases; NOGO 82 cases; and Sygen 70 cases. An additional 8.0% of the sample had a major head injury (GCS≤ 12) and would have been excluded from the trials. RHSCIR provides a comprehensive national dataset which may serve as a useful tool in the planning of multicentre clinical SCI trials [1)].

Case series

2016

14 patients were recruited within 72 hours of severe spinal cord injury. Phang et al inserted intradurally at the injury site a pressure probe, to monitor continuously spinal cord perfusion pressure, and a microdialysis catheter, to monitor hourly glycerol, glutamate, glucose, lactate and pyruvate. The pressure probe and microdialysis catheter were placed on the surface of the injured cord.

Microdialysis monitoring did not cause serious complications. Spinal cord perfusion pressure 90 - 100 mmHg and tissue glucose >4.5 mM minimized metabolic derangement at the injury site. Increasing spinal cord perfusion pressure by ~10 mmHg, increased the entry of intravenously administered dexamethasone at the injury site three-fold.

This study determined the optimum spinal cord perfusion pressure and optimum tissue glucose concentration at the injury site. They also identified spinal cord perfusion pressure as a key determinant of drug entry into the injured spinal cord. The findings challenge current guidelines, which recommend maintaining mean arterial pressure at 85 - 90 mmHg for a week after spinal cord injury. They propose that future drug trials for spinal cord injury include pressure and microdialysis monitoring to optimize spinal cord perfusion and maximize drug delivery at the injury site [2)].

Using provincial administrative health data, adult patients with acute traumatic SCI who underwent

surgery between 2002 and 2011 were identified using SCI specific ICD-10 codes. The relationship between predictor variables and a) time to arrival at the site of definitive care and b) time to surgery was statistically evaluated. Of 1,111 patients meeting eligibility criteria, mean times to arrival at the site of definitive care and to surgery were 8.1 ± 25.5 and 49.4 ± 65.0 hours respectively, with 53.3% of patients having surgery prior to 24 hours. While most patients (88.4%) reached the site of definitive care within 6 hours, only 34.2% reached surgery within 12 hours of arrival. Older age (IRR = 1.01; 95% CI: 1.01, 1.02), increased number of stops at intermediate Healthcare centers (IRR = 7.70; 95% CI: 7.54, 7.86), higher comorbidity index (IRR = 1.43; 95% CI: 1.14, 1.72) and fall related SCI etiology (IRR = 1.16; 95% CI: 1.02, 1.29) were associated with increased time to arrival at definitive care. For surgery, increased age (OR = 1.02; 95% CI: 1.01, 1.03) and stops at intermediate health centers (OR = 2.48; 95% CI: 1.35, 4.56) were associated with a greater odds of undergoing late surgery (>24hrs). These results can inform policy decisions and facilitate creation of a streamlined path to specialized care for patients with acute SCI [3].

1)
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2)
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3)
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