Spine

For other Roundups in this issue that cross-reference with Spine see: Research Roundup 3, 4.

Traumatic spinal cord injury under the spotlight

x-ref Trauma

There are precious few large epidemiological studies investigating long-term patterns of treatment and disease. Although often not scintillating reading, these types of studies are of key importance to establishing what the trends in disease incidence are and how effective changes in treatment and disease prevention have been. Blunt traumatic injuries on the whole are reducing, with safer cars, workplaces and in many parts of the world, lower crime rates. However, there is little data surrounding spinal injury in particular, and we were delighted to see that epidemiologists from **Nashville, Tennessee (USA)** have stepped up to fill this gap. Using the now all-too-familiar method of the National Inpatient Sample, the researchers set out to predict the trends of spinal cord injury over a ten year period and also undertook some basic outcome and causation analysis. The overall incidence reported across the study was unchanging, with 53/million (based on 2659 cases) in 1993 and 54/million in 2012 (based on 3393 cases). Although the incidence hasn't changed, the population demographics have; the proportion of cases in the older age group has increased dramatically (particularly in men over 65, from 84/million to 131/million), with a matching reduction in incidence in the younger age group. As perhaps would be expected, this was matched with a change in aetiology, with falls making up just 28% of cases between 1997 and 2000, and 66% from 2010 to 2012.[1] It is important to remember when extrapolating these kinds of figures that cross-sectional sampling doesn't always reflect national trends, and that the numbers in each sample year are actually quite low. However, this paper does reflect an important message – there has been a huge shift in the burden of spinal cord injury over the last 20 years, with the majority now not being from RTCs or assaults, but fragility fractures in predominantly elderly men. Treatment and prevention strategies should reflect this population change.

The odontoid peg nonunion

x-ref Trauma

Odontoid peg fractures are common in the elderly population and will likely become more common as the population ages. Spinal surgeons in **New York (USA)** asked what seems to be an obvious question – what happens if it doesn't heal? They identified 34 patients with minimally displaced Type II fractures treated conservatively with a rigid collar. Contrary to perhaps much of the perceived wisdom, the authors of this study report that 88% went on to nonunion, despite 12 weeks of immobilisation. All of the patients they were able to follow-up ended up with a displaced mobile nonunion, although outcomes as assessed with the VAS scale and Neck Disability Index suggest that although not united, the functional outcomes are excellent. As perhaps would be expected in a cohort of elderly frail patients, there was a high mortality rate, with 68% of patients dying within the average 4-year follow-up period of the study. The authors were able to establish that the deaths were not attributable to the failure of union and there were no adverse neurological events in the longer term.[2] It does leave us wondering here at *360* why, given that these patients invariably go on to nonunion, do we treat them with 3 months of hard collar immobilisation? Surely a source of much morbidity in a frail age group.

Driving and spinal surgery

One of the most often asked questions of a clinician in clinic is, "Doctor, when can I return to driving?" A simple question that rarely has a simple answer. Clinicians often make judgements based on the patient, past experience and a 'gut feeling'. There are however more scientific ways of establishing the answer to this. Following on from previous work on hip and knee replacements, plaster casts and a range of other orthopaedic diagnoses, these researchers in **Los Angeles, California (USA)** set out to use driver reaction time as a measure of the likely 'safe point' to return to driving. The study team recruited 37 patients with a mixture of lumbar (n = 23) and cervical (n = 14) spinal surgery, and these were compared to 14 healthy controls. Measurements were made pre-operatively and at 2,6 and 12 weeks post-operatively.[3] The authors established that there were in fact no differences in pre- and post-operative reaction times. Whilst the authors conclude that it may be acceptable to allow patients with single-level spinal decompression to drive at 2 weeks post-operatively due to a normalised reaction time, it is important to take into consideration other factors such as patients' opioid use, ability to look round corners and return of normal breaking power. Perhaps patients shouldn't be encouraged to drive themselves to their post-operative check-up just yet!

Drains and antibiotics post-spinal surgery

Concerned about the possibility of introducing infection with prolonged postoperative drainage sometimes necessary in spinal surgery to prevent cord compression, researchers in **New York (USA)** undertook a prospective randomised control trial of 314 patients undergoing multilevel thoracolumbar surgery with drains placed for an extended period of time. Patients were randomised to receive prophylactic antibiotic cover for the duration of the drain insertion, or just the immediate 24 hour peri-operative period.[4] There were no significant differences seen in the rates of surgical site infection (which were astronomically high) of 12.4% in the 24 hour group and 13.2% in the longer prophylaxis group. Whilst we would applaud the authors for their undertaking of a randomised control trial on the sticky subject of peri-operative antibiotic cover for drain retention, we are concerned here at *360* that given the above-expected level of superficial infection, things may not be all they seem.

Vertebroplasty and kyphoplasty equally effective

In selected patients there is an excellent indication for the use of percutaneous cement augmentation to treat vertebral compression fractures. Whilst the vast majority of spinal surgeons would agree with this, there are staunch proponents of the kyphoplasty, and equally staunch proponents of the vertebroplasty approach. Spinal surgeons in **Charlottesville (Virginia, USA)** have designed their own prospective study to establish the relative merits of both approaches. Their study design was a randomised controlled trial with a primary outcome measure of pain scores at baseline and regular follow-ups for a year following intervention. All of the 115 study participants had sustained a vertebral body compression fracture which would be suitable for intervention by kyphoplasty or vertebroplasty.[5] Essentially in the first study to attempt to establish the effect size difference between the two interventions, the difference in pain and disability is essentially irrelevant. This then remains dealer's choice.

Who will benefit from steroid injections?

Epidural corticosteroid injections are a staple of spinal care pathways the world over. Offering the potential of pain relief for sometimes many months following injection, epidural corticosteroid injections are the mainstay of treatment with a low risk

of complications for many patients who do not wish to undergo/are unsuitable for surgery. However, the effect is variable, with some patients benefitting greatly, and some barely benefitting at all. Authors in **Seattle (USA)** hoped to shed some light on exactly which patients will benefit from epidural steroids using a randomised controlled trial as their platform. The study population consisted of 400 patients randomised to either epidural with lidocaine alone or epidural with lidocaine and corticosteroid, in 16 centres across the US. All patients had symptoms of moderate or severe leg pain and central lumbar spinal stenosis. Outcomes were assessed with a pain scale and the Roland-Morris Disability Questionnaire (RMDQ).[6] The authors collated data on 21 potential predictors of benefit and used covariant analysis to explore which were linked to any of the six outcome measures. The only variable that appeared in this study to have any bearing on prediction of outcome was the ED-5D score, with patients who rated their quality of life as 'poor' benefitting more than those who did not. There were some predictors of a good outcome in both groups – but surprisingly nothing else was predictive of a beneficial effect of steroids.

Back pain following lumbar discectomy

■ In an unusual methodology, surgeons in **Nashville (USA)** undertook a systematic review and longitudinal study in their attempt to establish who gets long-term back pain following lumbar disc decompression. Whilst we intrinsically don't like this kind of mixed methodology study here at *360*, there is a valuable message in this paper. The review team were able to identify 90 studies including the outcomes of 21 180 patients reported at least six months following decompression for an isolated lumbar disc prolapse. To this the results of their own 103 patients were added as a prospective outcomes cohort, using a range of PROMs measures. The systematic review suggested high levels of reported secondary back and leg pain, with studies reporting between a 3% and 36% incidence of both at 1- or 2-year follow-up, although rates

of reoperation were much lower, at between 0% and 13%.[7] The prospective portion of this study found similar results, with their patients reporting worsening of either lower back pain or disability in 26% of patients by two years. This study serves to underline the ongoing disability suffered by many patients following a prolapsed lumbar disc.

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Trauma

For other Roundups in this issue that cross-reference with Trauma see: *Foot & Ankle Roundup 1, 2; Wrist & Hand Roundup 4, 5; Shoulder & Elbow Roundup 4, 7; Spine Roundup 1, 2; Paeds Roundup 2, 3, 4, 6, 8; Research Roundup 2, 3, 4.*

PCA not the best in resuscitation

x-ref Research

■ The provision of adequate and optimal pain management can be tricky at the best of times, but in the emergency department and particularly the resus room, it can be incredibly challenging to provide adequate analgesia. One potential solution is to use patient-controlled analgesia (PCA) which has an excellent track record in the provision of peri-operative analgesia in elective and emergency surgical care. A research team in **Plymouth (UK)** set out to determine if PCA has a role to play in controlling pain following traumatic injury in the emergency department. They carefully designed a randomised controlled trial of 200 participants, undertaken across five hospitals. Patients were included if presenting to the emergency room with traumatic injury requiring admission, and for which intravenous opioid analgesia was required for pain control. Patients were randomised to either a PCA or nurse-managed, titrated analgesia. Outcomes were assessed using hourly pain scores, with the primary outcome measuring the area under the curve. Secondary outcomes included total morphine use, satisfaction, sleep period and hospital length of stay.[1] Perhaps surprisingly, there was no difference in the primary outcome measure between patients, with the PCA group faring marginally better (AUC 44.0 *vs* 47.2) but with no statistically significant difference. Interestingly, the PCA group used significantly more morphine (443 mg *vs* 27.2 mg) but there were no significant differences in satisfaction rates.

Impact of trauma centre care

■ The maturation of the trauma networks continues and the latest figures in the UK from the Trauma Audit Research Network (TARN) show a 50% improvement in mortality over the past three years in the UK. In other areas of the world, networks are more mature, but arranged in different manners. One of the surprising things about trauma networks is that our understanding of which patients benefit, and why, leaves something to be desired. If we could understand why there is such a profound survival benefit, we may even be able to improve on these figures. A collaboration between **San Francisco (USA)** and **Seattle (USA)** has shed some light on what is achievable in the field of pelvic and acetabular fractures within the setting of a trauma network. This registry-type study concerns the outcomes of patients managed both within (18 centres) and without