RCoA Research, Education & Travel Grants 2017

Award: Sargant Fund

Applicant: Dr Boyne Bellew

Project Title: *Serratus Anterior Block and catheter use in Rib fractures in the Emergency department*

Project Description:

The main aim of this single centre, randomized controlled study is to determine whether Serratus Anterior Plane (SAP) blockade provides improved analgesia after rib fractures compared to epidural administration of the local anaesthetic.
We aim to show that SAP catheter (SAPC) can be placed in more situations and are less operator-dependent then thoracic epidural anaesthesia (TEA). This reduces the waiting time required to achieve satisfactory analgesia in the patient. The decreased failure rate and reduction in treatment side effects will also improve patient experience. Optimal analgesia allows early respiratory physiotherapy and reduction in the complications of multiple rib fractures, which may aid recovery times and shorten time to discharge. Since respiratory parameters may deteriorate significantly, without adequate pain relief, to the detriment of the patient, we are seeking funding to purchase a spirometer to compare these parameters in our study.

Pain from rib fractures can be severe. The SAP is a fascial plane in the thoracic wall between the latissimus dorsi and the serratus anterior muscles. The sensory nerves of the thoracic wall lie in this plane and a single injection of local anaesthetic spreads widely and provides useful post-injury analgesia for several hours. If a catheter is left in the SAP, the nerve blockade can be maintained for several days. Ultrasound-guided SAP block (SAPB) and catheter has been shown to provide good analgesia that was comparable to TEA for acute post-thoracotomy pain.

Rib Fracture pain is traditionally treated with systemic analgesics or thoracic epidural block. Opiate analgesia via patient controlled analgesia (PCA) can work very well but it is often associated with excessive sedation, constipation, nausea and vomiting. Continuous TEA is generally regarded as the gold standard but it demands monitoring by adequately trained ward staff and is commonly associated with high failure rates and increased risk of complications (hypotension, urinary retention, itching and weakened legs). SAPC has also been used when TEA and PCA were not desirable due to relative contraindications (e.g. coagulopathy).

The primary outcome will be the amount of morphine analgesia required by the patient, delivered by a PCA. Secondary outcomes will be static and dynamic pain scores, measures of the side effects of morphine (nausea, vomiting, itching, delayed bowel function), complications of TEA/ SAPC (failure/ intervention rates, patient refusal), spirometry measures of respiratory function and a pre-discharge quality of recovery assessment.

Eligible patients will be recruited to one of 2 arms of the trial:
A) Patients with rib fractures only and no other injuries

B) Patients with rib fractures and other injuries, including other traumatic fractures or thoracic/abdominal/pelvic injuries.

The control group will have an epidural block and catheter placed. The dermatomal level of the block will be tested to ensure adequate analgesia. The treatment group will have SAP blocks and catheters placed under ultrasound guidance. The block will be tested to ensure adequate analgesia. To avoid potential confounding effects, analgesic management will adhere strictly to the study protocol.

We aim to publish our results in a peer-reviewed journal.