Maine Medical Center
Department of Emergency Medicine

Journal Club / Research Article Summary - (Adapted from Schultz Table)

Date: 9/18/2013
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ARTICLE:
- Country: United Kingdom
- Funding Sources: None listed.

PURPOSE:
- Research Question(s): Is 3-in-1 femoral nerve block effective when taught to and implemented by ED medical staff in patients who present with fractured neck of femur?
  - Hypothesis: Not explicitly stated.

DESIGN:
- Study Design: Prospective randomized controlled trial, blinded to nurses collecting data and observer who abstracted data, unblinded to patients
- Dependent / outcome Variable(s):
  - Pain score measured at defined intervals
    - 0-3 scale correlating to no pain, mild, moderate and severe pain
    - baseline with repeat at 1, 4, 8, 12, 16, 24 hours after randomization
  - Morphine given over 24 hour period
  - Vital signs (pulse, oxygen saturation, respiratory rate)
- Independent / research Variable: IV Morphine alone for analgesia vs. 3-in-1 Femoral nerve block with morphine for analgesia

SETTING / SUBJECTS:
- Research Setting: United Kingdom medium sized district general hospital emergency department; 65,000 new patients per year
- Subjects:
  - Study population: Patient’s presenting to the UK hospital emergency department with fractured neck of femur
○ **Inclusion / Exclusion criteria:**
  - Inclusion criteria defined by presence of femoral neck fracture in a patient presenting to the emergency department during a 6 month recruiting period from February - August (2002?)
  - Exclusion criteria included patient who were confused, taking warfarin, had a bleeding diathesis, had a local or systemic infection or had previous hypersensitivity to local anesthetics.

○ **Number (control / intervention groups):**
  - n = 90, 42 excluded for confusion, 1 patient refused, 1 patient overlooked
  - 50 subjects studied
  - 24 study patients
  - 26 control group patients

○ **Demographics:**
  - Study patients mean age 76, 71% female (n = 17)
  - Control patients mean age 80, 69% female (n = 18)
  - Other demographic factors such as race were not addressed

○ **Attrition:**
  - Some unnumbered patients to OR by 24 hour time mark; 24 hour time mark excluded from analysis
  - “Minimal missing data” from earlier time marks

**METHODS:**
- **Interventions:**
  - All ED staff underwent an accreditation package (30 minute instruction, supervised simulation practice, supervised patient nerve block - not included in study with verification of safe and satisfactory technique)
  - Study patients received the 3-in-1 nerve block (femoral, lateral femoral cutaneous and obturator nerves) 20 mL 0.5% bupivacaine with a 21-gauge needle inserted one cm lateral to femoral artery pulsations below the inguinal line. This was performed with a parasthesia technique of nerve localization without ultrasound or nerve stimulator.
  - Control patients received 5-10 mg IV morphine hourly “until analgesia was achieved"
  - An initial dose of morphine was provided for all patients who required it prior to radiographic determination of injury. This dose was included in the analysis of total morphine used. No comment was made on the availability or usage of morphine in the study group following nerve block.
• **Study Groups:**
  ○ Control group - morphine only; Study group - 3-in-1 nerve block as above

• **Instruments:**
  ○ 0-3 point validated pain scale measured as “pain on movement”

• **Data Collection:**
  ○ Pain assessment performed by ward nursing staff blinded to the intervention at intervals as above. Nearest time estimate was used when needed.
  ○ Data was abstracted in blinded fashion by the primary author including total dose of morphine in 24 hours or until surgery, type of fracture and time to surgery.
  ○ Hospital notes for the patient were reviewed at 6 months for evidence of complications.

**DATA ANALYSIS:**
- **Level of Data:** Categorical  Ordinal  Interval
- **Statistics Used:**
  ○ used weighted means after adjusting for baseline values of covariance to analyze pain score data, vitals, and time to best response
  ○ refers to analysis technique as a “method of summary measures”

- **What, if any, confounding variables were controlled for / adjusted for:**
  ○ gender
  ○ age

**RESULTS:**
- **Brief answers to research questions:**
  ○ Decreased time to best response based on calculated mean pain score from control to study group (-2.93 h [-5.48 to -0.38 h])
  ○ Decreased mean pain score (1.34 without block vs. 0.57 with block or mean difference -0.78 [-1.02 to -0.54])
  ○ Decreased mean morphine dose per hour (-0.68 mg/h [-1.23 to -0.12 mg/h])
  ○ No statistical difference in pulse, oxygen saturation or respiratory rate

- **Additional findings:**
  ○ No reported adverse effects from nerve blocks
  ○ 6 month follow up
    - 6 patients died - 3 from each group
    - 2 study and 4 control patients had developed LRTI on note review
    - 2 patients developed DVT on side of injury/nerve block - 1 from each group
• Limitations?:
  ○ Unblinded patient population and potential placebo effect
  ○ Potential for patients to disclose nerve block to blinded nurse pain assessors
  ○ Large proportion of patients excluded for confusion which could contribute to sampling bias, potentially exclude sicker patients
  ○ Near complete uniformity or morphine for analgesia with 2 patients receiving NSAID’s and one patient initially receiving diamorphine

IMPLICATIONS FOR PRACTICE:
• Applicable to this clinical practice:
  ○ Directly related by emergency department setting and elderly patient population.
  ○ Applicable as a study performed in a learning institution
  ○ Potentially significant variables include different country (UK vs. US), different

• Feasibility (cost, resources, etc): The feasibility of this procedure is limited by time to train junior providers and time to perform the procedure, neither of which are particularly extensive or prohibitive. Their procedures were performed without ultrasound guidance. Although no complications were documented in this study from nerve blocks, the availability of ultrasound in our department could decrease the potential risk of complications from the procedure.

• Clinically Relevant: Pain management is a major issue in the emergency department currently, and time to adequate analgesia is being closely monitored. By decreasing the amount of narcotic analgesia and reducing time to pain control we could improve patient satisfaction and decrease the risk of adverse effects associated with narcotics (nausea, somnolence).

LEVEL OF EVIDENCE / DECISION FOR USE:
• Background  Consider Replication  Ready for use

• Level of Evidence:
  Ib  Evidence obtained from at least one RCT