

Abstracts

Ultrasound-guided peripheral nerve blocks: what are the benefits?

Koscielniak-Nielsen ZJ.

BACKGROUND: Use of ultrasound by anaesthesiologists performing regional blocks is rapidly gaining popularity. The aims of this review were to summarize and update accumulating evidence on ultrasound-guided nerve blocks, with an emphasis on the clinical relevance of the results and to critically appraise changing standards in regional anaesthesia. **METHODS:** A search of MEDLINE and EMBASE (1966 to 31 December 2007) was conducted using the following free terms: 'ultrasound and regional anaesthesia', 'ultrasound and peripheral block' and 'ultrasound and nerve and block'. Trial type: meta-analysis, randomized-controlled trial and clinical trial. **RESULTS:** When peripheral nerves are adequately imaged by ultrasound, the concomitant use of nerve stimulation offers no further advantage. However, several studies reported problems with obtaining satisfactory images in some patients. Ultrasound guidance significantly shortened the block performance time and/or reduced the number of needle passes to reach the target in all comparative studies. The occurrence of paraesthesia during block performance was also reduced, but not the incidence of short-lasting post-operative neuropraxia. The frequency of accidental vascular punctures may be lower, but the data are contradictory. Block onset time was significantly shortened. Block duration was longer in children, but not in adults. Ultrasound also allowed dose reduction of the local anaesthetic (LA). **CONCLUSIONS:** Ultrasound guidance shortens the block performance time, reduces the number of needle passes and shortens the block onset time. Blocks may be performed using lower LA doses. (*Acta Anaesthesiol Scand.* 2008 Jul;52(6):727-37.)

Decline in research publications from the United Kingdom in anaesthesia journals from 1997 to 2006.

Feneck RO, Natarajan N, Sebastian R, Naughton C. We undertook this survey to identify the trend in the

published output of original research in anaesthesia emanating from the United Kingdom (UK) in a 10-year period from 1997 to 2006, inclusive. We examined seven major anaesthetic journals for each of the 10 years, and four other specialist journals for the years 1997, 2000, 2003 and 2006. We included papers on experimental research, randomised controlled clinical trials, large observational studies and case series, formal equipment and apparatus assessments, but we excluded editorials, comments, reviews including systematic reviews, special articles, small case series and case reports, questionnaire surveys of clinical practice and correspondence. We found a highly significant reduction in published research output from the UK in the period under study (% change per year; -5.7 (95% CI -7.4 to -4.0), a trend which was significantly different ($p < 0.001$) from the trend of changes in research publications worldwide (-1.0% change per year; 95% CI -1.7 to 0.0). We discuss the implications of these findings for UK anaesthesia research strategy. (*Anaesthesia.* 2008 Mar;63(3):270-5.)

A bibliometric analysis of global clinical research by anaesthesia departments.

Swaminathan M, Phillips-Bute BG, Grichnik KP.

BACKGROUND: Few studies have investigated the diversity in research conducted by anaesthesia-based researchers. We examined global clinical research attributed to anaesthesia departments using Medline and Ovid databases. We also investigated the impact of economic development on national academic productivity. **METHODS:** We conducted a Medline search for English-language publications from 2000 to 2005. The search included only clinical research in which institutional affiliation included words relating to anaesthesia (e.g., anaesthesiology, anaesthesia, etc.). Population and gross national income data were obtained from publicly available databases. Impact factors for journals were obtained from Journal Citation Reports (Thomson Scientific). **RESULTS:** There were 6736 publications from 64 countries in 551 journals. About 85% of all publications were represented by 46 journals.

Randomized controlled trials constituted 4685 (70%) of publications. Turkey had the highest percentage of randomized controlled trials (88%). The United States led the field in quantity (20% of total) and mean impact factor (3.0) of publications. Finland had the highest productivity when adjusted for population (36 publications per million population). Publications from the United States declined from 23% in 2000 to 17% in 2005. CONCLUSIONS: Clinical research attributable to investigators in our specialty is diverse, and extends beyond the traditional field of anesthesia and intensive care. The United States produces the most clinical research, but per capita output is higher in European nations. (Anesth Analg. 2007 Dec;105(6):1741-6,)

Sciatica: a review of history, epidemiology, pathogenesis, and the role of epidural steroid injection in management.

Stafford MA, Peng P, Hill DA.

Radicular pain in the distribution of the sciatic nerve, resulting from herniation of one or more lumbar intervertebral discs, is a frequent and often debilitating event. The lifetime incidence of this condition is estimated to be between 13% and 40%. Fortunately, the majority of cases resolve spontaneously with simple analgesia and physiotherapy. However, the condition has the potential to become chronic and intractable, with major socio-economic implications. This review discusses the history, epidemiology, pathophysiology, and natural history of sciatica. A Medline search was performed to obtain the published literature on the sciatica, between 1966 and 2006. Hand searches of relevant journals were also performed. Epidemiological factors found to influence incidence of sciatica included increasing height, age, genetic predisposition, walking, jogging (if a previous history of sciatica), and particular physical occupations, including driving. The influence of herniated nucleus pulposus and the probable cytokine-mediated inflammatory response in lumbar and sacral nerve roots is discussed. An abnormal immune response and possible mechanical factors are also proposed as factors that may mediate pain. The ongoing issue of

the role of epidural steroid injection in the treatment of this condition is also discussed, as well as potential hazards of this procedure and the direction that future research should take. (Br J Anaesth. 2007 Oct;99(4):461-73.)

Ultrasound guidance with nerve stimulation reduces the time necessary for resident peripheral nerve blockade.

Orebaugh SL, Williams BA, Kentor ML.

BACKGROUND AND OBJECTIVES: Educating residents in peripheral nerve blockade may impact the efficiency of a busy regional anesthesia service. Ultrasound guidance may affect the efficiency and effectiveness of nerve block. We examined the impact of ultrasound guidance on resident performance of peripheral nerve block in a regional anesthesia rotation. METHODS: An existing de-identified database was used for retrospective analysis of resident performance of interscalene, axillary, femoral, and popliteal nerve blocks, by peripheral nerve stimulator guidance alone and by nerve stimulator aided by ultrasound. The primary variable examined was the time required to perform the block. Others variables included (1) number of needle insertions; (2) proportion of blocks in which there was a blood vessel puncture; and (3) block efficacy. Peripheral nerve-stimulator blocks were guided by surface anatomy and motor stimulation, refined to 0.2 to 0.5 mA of current before injection of local anesthetic, while ultrasound nerve stimulator blocks were confirmed using a current of 0.5 mA. RESULTS: Ultrasound-aided blocks required less time to perform (median = 1.8 min) than nerve stimulator-guided blocks (median = 6.5 min, $P < .001$). More needle insertions were required for nerve localization in the nerve stimulator-guided blocks (median = 6) than in ultrasound-aided blocks (median = 2; $P < .001$). There were fewer blood vessel punctures with ultrasound-aided blocks ($P = .03$). CONCLUSIONS: During resident teaching, ultrasound-aided peripheral nerve-stimulated block required less time to perform than did nerve-stimulator-guided blocks. Fewer needle insertions were required to perform the ultrasound-guided

blocks, and there were fewer blood vessel punctures when ultrasound was used. (*Reg Anesth Pain Med.* 2007 Sep-Oct;32(5):448-54.)

A randomized trial of ultrasound-guided brachial plexus anaesthesia in upper limb surgery.

Soeding PE, Sha S, Royse CE, Marks P, Hoy G, Royse AG.

Ultrasound guidance allows real-time identification of relevant anatomy and needle position when performing brachial plexus regional anaesthesia. The aim of this investigation was to determine whether the use of surface ultrasound could improve the quality of brachial plexus anaesthesia for upper limb surgery. Forty patients were randomized to either conventional "landmark-based" plexus anaesthesia, or to an ultrasound-guided approach using a 13 MHz linear array transducer. Both interscalene and axillary techniques were used. The use of ultrasound significantly improved the onset and completeness of sensory ($P=0.011$) and motor ($P=0.002$) block. Ultrasound guidance also significantly reduced ($P=0.012$) the incidence of paraesthesia during the performance of the blocks. Ultrasound guidance increases the quality of sensory and motor blockade in brachial plexus regional anaesthesia, and by reducing the incidence of paraesthesia during performance of the blocks, may confer greater safety. (*Anaesth Intensive Care.* 2005 Dec;33(6):719-25.)

Scoring systems for prediction of mortality in patients with intensive care unit-acquired sepsis: a comparison of the pitt bacteremia score with APACHE II scoring systems.

Rhee JY, Kwon KT, Ki HK, Shin SY, Jung DS, Chung DR, Ha BC, Peck KR, Song JH.

This study compares the effectiveness of the Pitt bacteremia score, the Charlson weighted index of comorbidity, and the Acute Physiology and Chronic Health Evaluation II (APACHE II) scoring systems for the prediction of mortality in intensive care unit (ICU) patients with sepsis using the retrospective

observational method on 134 patients with ICU-acquired sepsis. The statistical analyses show several important findings. First, Pitt bacteremia score is significantly correlated with the APACHE II scoring system (correlation coefficient = 0.738, $P < 0.001$). Second, the APACHE II scoring system, the Pitt bacteremia score, and the Charlson weighted index of comorbidity are independently correlated with mortality. Third, the Pitt bacteremia score and the APACHE II scores are positively related to mortality in patients with ICU-acquired sepsis. As the result of the analyses, the mortality rate in patients with sepsis in the ICU is better predicted with the Pitt bacteremia score because it provides better estimation of sensitivity and specificity than the APACHE II scoring system and the Charlson weighted index of comorbidity. (*Shock.* 2008 Jul 16.)

Beta-blockers In Sepsis: Reexamining The Evidence.

Novotny NM, Lahm T, Markel TA, Crisostomo PR, Wang M, Wang Y, Ray R, Tan J, Al-Azzawi D, Meldrum DR.

Sepsis remains the leading cause for noncardiac intensive care unit deaths in the United States. Despite recent advances in the treatment of this devastating condition, mortality and morbidity remain unacceptably high. Sepsis is characterized by a multitude of pathophysiological changes that include inflammation, metabolic derangements, hemodynamic alterations, and multiorgan dysfunction. Unfortunately, several studies of treatment modalities aimed at correcting one or more of the underlying derangements have led to disappointing results. New treatment modalities are needed. beta-Receptor blockers have long been used for a variety of conditions such as coronary artery disease, congestive heart failure, and arterial hypertension. Recent data suggest that beta-blocker effects on metabolism, glucose homeostasis, cytokine expression, and myocardial function may be beneficial in the setting of sepsis. Although treating a potentially hypotensive condition with a drug with antihypertensive properties may initially seem counterintuitive, the metabolic and

immunomodulatory properties of beta-blockers may be of benefit. It is the purpose of this review to discuss the effects of beta-blockers on the following: (1) metabolism, (2) glucose regulation, (3) the inflammatory response, (4) cardiac function, and (5) mortality in sepsis. (Shock. 2008 Jul 16. [Epub ahead of print])

Diuretics in acute kidney injury.

Karajala V, Mansour W, Kellum JA.

BACKGROUND: In an acute care setting, diuretics are often prescribed to maintain or increase urine output in patients presenting with acute kidney injury (AKI). The rationale behind giving diuretics is that they may protect the kidney from ischemic injury by maintaining a nonoliguric state. There have been many studies both supporting and criticizing diuretic use in AKI for improving overall patient outcomes.

METHODS: A systematic review of the literature was conducted to evaluate the role of diuretics including osmotics, loop diuretics, and nesiritide in modifying AKI.

RESULTS: There was no evidence to suggest that the use of loop diuretics in AKI reduces mortality, the need for dialysis, the number of dialysis sessions, or length of Intensive Care Unit/hospital stay or that it increases the recovery of renal function. There is no benefit for the use of mannitol as an osmotic diuretic over hydration in rhabdomyolysis. In contrast, mannitol was found to cause more harm and to induce nephropathy. Nesiritide did not improve renal function in patients with decompensated heart failure and mild chronic renal insufficiency. Nesiritide may be effective in the prevention of AKI when applied in lower doses for a prolonged period of time in patients with mild to moderate renal insufficiency.

CONCLUSION: Diuretics have been shown to be ineffective in the prevention of AKI or for improving outcomes once AKI occurs. At best, diuretics can help decrease symptoms of pulmonary edema

secondary to volume overload. (Minerva Anesthesiol. 2008 Jul 18. [Epub ahead of print])

[Flexible bronchoscopy in a pediatric pulmonology service]

Maffey AF, Berlinski A, Schkair JC, Teper AM.

INTRODUCTION: Flexible bronchoscopy is a valuable diagnostic and therapeutic tool. The objective of the study is to describe the experience with flexible bronchoscopy in a Pulmonology Section of a Pediatric tertiary care hospital associated to the university. **POPULATION AND METHODS:** Studies performed between 01/2002 and 12/2005 were reviewed. Olympus(R) bronchoscopes (external diameters 2.8 and 4.8 mm) were used. Bronchoalveolar lavage was performed with 3 aliquots of 1 ml/kg of warmed sterile saline solution. **RESULTS:** One hundred and two fiberoptic bronchoscopies (49 males, 42 outpatients) and 77 bronchoalveolar lavage were performed. Patient's age ranged from 2 months to 18 years. Fifty one studies were done in an endoscopy suite, 47 in the operating room and 4 in the intensive care unit. Patient's diagnosis were: chronic lung disease (recurrent/persistent pneumonia, bronchiectasis, primary ciliary dyskinesia) 65% (n: 66); immune deficiencies 18% (n: 18); cystic fibrosis 7% (n: 7), difficult airway 5% (n: 6) and noisy breathing 5% (n: 5). Ten patients developed mild complications (7 hypoxemia, 2 upper airway obstruction, 1 cardiac arrhythmia), and 1 patient a severe one (severe bronchial obstruction). Eighty five (65/77) bronchoalveolar lavage samples, 100% (12/12) bronchial brushing and 100% (6/6) endobronchial biopsies were representative. Procedures helped the decision-making process in 75% (76/102) of the patients studied. **CONCLUSIONS:** In this carefully selected population, flexible bronchoscopy and bronchoalveolar lavage were useful for their diagnosis and treatment. (Arch Argent Pediatr. 2008 Feb;106(1):19-25)