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Video Analysis as a Tool for Learning Epidural Skills.

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INTRODUCTION: Improper placement of epidural analgesia for labor is associated with unacceptable failure and complication rates. Self appraisal of psychomotor skills has been described, but is not commonly used for teaching of epidural technique. Based on information gained from a preliminary study using video technology in teaching anesthesia skills, the aim of the current study was to evaluate further the applicability of video technology in teaching Anesthesiology residents to place epidurals flawlessly.

METHODS: Anesthesiology residents doing their first obstetric anesthesia rotation were randomly assigned to one of two groups. Group I residents (n=9) were allowed to view their videotape together with an attending anesthesiologist and fellow. Group II residents (n=9) did not review their tapes but instead had a daily tutorial. Four judges, blinded to resident and video review group, evaluated specific criteria of epidural technique on days 1, 15, and 30. Each criterion was given a score of 0-2 (0=major error, 1=minor error, 2=no error). Agreement among judges was assessed by kappa coefficients.

RESULTS: Inter-rater reliability was excellent for each evaluated skill, (K ranged from 0.7 to 0.9). Day 1 grades were low in both groups, particularly for aseptic technique, needle withdrawal technique, and gentle treatment of the patient. Day 30 grades were much improved in both groups, however the video group demonstrated greater skill particularly in aseptic technique and control of the needle. In addition, the percentage of residents with substantial improvement in skills between Days 1 and 30 (excluding those few residents who demonstrated near perfect technique on Day 1 and could therefore not show perceptible improvement) was markedly greater in the video group.

DISCUSSION: Videotape assisted teaching of epidural anesthesia technique may be a valuable tool that improves skills while allowing residents to participate actively in their own learning experience. Video review also permits teaching without heuristic and critical discussions in the presence of an awake parturient.

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Neural Substrates Of Labour Pain: Uterine Distension In The Rat During Oestrus Elevates Nitric Oxide In Neurons Of The Nucleus Of The Solitary Tract
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Introduction: Childbirth is often associated with severe pain. First stage labour pain (LP) (uterine contractions) is predominantly visceral, but poorly understood. Recent investigations have shown that noxious visceral stimuli evoke both increased nitric oxide (NO) synthesis and neuronal activation in specific areas of the 'central visceral pain pathways' (1). The nucleus of the solitary tract (NTS) has recently been recognised as an important viscerosensitive relay of the brainstem (2). The purpose of this study was to define specifically whether NO synthesis is upregulated and neurons are activated in the NTS during first stage LP using detection of NADPH diaphorase (NADPH-d) and Fos protein expression, respectively, in a rat model of parturition.

Methods: Three groups of virgin female Wistar rats in oestrus were anaesthetised with 1% halothane. In Gp I (n=6), a balloon catheter was introduced into the uterine horn and inflated under direct vision. In Gp II (n=7), the balloon was introduced but not inflated. Gp III animals (n=6) were anaesthetised only. At 2 hours, each rat was perfused through the heart with fixative and the brain removed. Histochemical detection of NADPH-d was used to visualise neurons synthesising NO and immunohistochemical detection of Fos used to visualise 'activated' neurons in coronal sections of the brainstem containing the NTS.

Results: There was an increase in NADPH-d containing neurons in the NTS of rats in Gps I and II compared with the surgical controls (Gp III). Moreover, there was a 44% increase in the number of NADPH-d containing neurons in the rats which underwent uterine distension (Gp I) compared with Gp II. Although Fos expression increased in Gp I, there were no cells that contained both markers.

Discussion: These data indicate that pain arising from distension of the uterus evokes an increase in NO production by neurons of the NTS. Furthermore, they suggest that NTS neurons play an important role in the processing of Stage I LP. The NTS has been identified as a source of descending spinal inhibition.

Determination of a specific role of NTS-NO containing cells will allow us to evaluate whether these neurons could be targeted to develop more selective analgesic techniques for this specific pain experience.

References: 1) Brain Res 1999; 834: 173. 2) J Comp Neurol 1992; 315: 244.

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Effect Of Oral Naproxen On Pain Following Cesarean Section

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Introduction: Intrathecal morphine can reduce postoperative pain after Cesarean section (C/S) for about 18 hours¹. Non-steroidal anti-inflammatory drugs (NSAIDs) can augment the analgesia provided by intrathecal morphine.^{2,3} Naproxen is a NSAID that is safe for lactating mothers³, is easy to administer (oral or rectal), and is inexpensive. However, the benefits and the dosage of naproxen after C/S remain controversial. The purpose of our study was to assess the effects and side effects of oral naproxen after C/S.

Methods: 110 women undergoing elective C/S under spinal anesthesia (bupivacaine 0.75%, fentanyl 15 mcg, morphine 150 mcg) were randomized to one of three analgesic groups. Each group received 2 pills in the post-anesthesia care unit (PACU) and then one pill every 8 hours for eight pills (10 pills in total). Naproxen pills (250mg) and placebo pills were visually identical. The groups were: placebo in PACU and placebo on the ward (PP); naproxen in PACU and placebo on the ward (NP); or naproxen both in PACU and on the ward (NN). Visual Analogue Scores (VAS) were recorded for pain at the following intervals: in PACU, 4 hours after spinal injection, and on post-operative days (POD) 1, 2 and 3. Additional analgesic medication required was recorded for the operative day, POD1, POD2, and POD3. The Fischer Exact Test and ANOVA with correction for multiple comparisons were used to analyze the data. The results are presented as mean±standard deviation.

Results: The records of 102 women randomized for the study were eligible for data analysis (33PP, 34NP, and 35NN). The dropout rate for inadequate analgesia was higher in the PP group (5) [NP(0), NN(0), p<0.05]. VAS on POD1 at rest and on ambulating was higher in the PP group (2.9±2.1 and 5.4±2.1) than in the NN group (1.3±1.3 and 3.9±2.2) (p<0.01). Fewer analgesic supplements were required (p<0.05) in the NN group on both POD1 and POD2 (6.3±3.2 and 9.1±7.0) when compared to the PP group (8.9±3.5 and 13.3±7.5), and the NP group (7.2±3.2, and 14.8±7.8).

Conclusion: Naproxen augments post-cesarean section analgesia. Patients who receive naproxen for 2 days are more comfortable and require less analgesic supplementation than those who receive either no naproxen, or only one dose of naproxen on the operative day.

References: 1. Anesthesiology 1999;91:1919-27.

2. Anesth. Analg. 1992;75:64-8. 3. Anesth. Intensive Care 1995;23:555-9.

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Efficacy and Cost-effectiveness of Prophylactic Ondansetron versus Metoclopramide for Cesarean Section patients under Epidural anesthesia
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INTRODUCTION: Cesarean under epidural anesthesia (EA) is associated with high incidence of emetic symptoms. This randomized, double blind study was the first to compare the cost-effectiveness and efficacy of prophylactic ondansetron (O), metoclopramide (M) and placebo (P) in cesarean (C/S) patients under EA.

METHODS: After IRB approval, 164 ASA I-II parturients scheduled to undergo non-emergent C/S under standard EA were randomly assigned to: GP M - 10mg IV metoclopramide; GP O - 4mg IV Ondansetron; and GP P-10 cc normal saline as placebo when umbilical cord was clamped. Promethazine (12.5-25 mg IV) was given as rescue if subsequent emetic symptoms persisted for > 10 mins. Bolus IV LR and ephedrine were given if systolic BP decreased > 20% from baseline. The incidence and total number of nausea and vomiting (N/V) episodes, need for rescue, need for nurse's response, N/V analog severity scores (0-10), analog sedation score (0-10), patient satisfaction, recovery room duration, side effects and treatment (labor and materials) cost for emetic symptoms were recorded for 24 hours post-delivery. Efficacy ratio between 2 GPs is defined as the inverse ratio of the total number of emetic episodes in the 2 GPs. Chi-squares, Fisher's exact test and ANOVA were used. P < 0.05 was considered significant.

RESULTS: Demographics were similar among 3 GPs. GP O had a lower incidence (24%, 26%) of nausea compared with GPs M (43%, 51%) and P (57%, 71%) for the Intraoperative period and the 24-hour period post-delivery respectively (P<0.03). Both groups O and M had similar incidence of vomiting and need for rescue antiemetic but the incidences were lower than those in GP P for the 24-hour period (P<0.05). Maximum analog sedation score was highest in GP M (P<0.05). Overall patient satisfaction was highest in group O (P<0.05). Based on the total number of emetic episodes as a measure of efficacy, relative cost-effectiveness for hospital cost per patient were \$21 (95% confidence interval (CI) \$11-33), \$30 (95% CI \$14-47) and \$64 (\$95% CI \$43-85) for groups O, M and P respectively.

CONCLUSION: Prophylactically administered IV ondansetron 4 mg is cost-effective and more efficacious than IV metoclopramide 10 mg and placebo in preventing nausea during cesarean section under epidural anesthesia and the first 24-hour postpartum period; and is associated with a higher patient satisfaction.