

Anesthesia and Intensive Care

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Introduction

Anesthesia or anaesthesia, traditionally meant the condition of having sensation (including the feeling of pain) blocked or temporarily taken away. It is a pharmacologically induced and reversible state of amnesia, analgesia, loss of responsiveness, loss of skeletal muscle reflexes or decreased stress response, or all simultaneously. This allows the patients undergo surgery and other procedures without the distress and pain they would otherwise experience.

Types of anesthesia include: Local anesthesia, regional anesthesia, General anesthesia and Dissociative anesthesia. Study of anesthesia is called "Anesthesiology" [1].

A case study was done on 10 persons and the aim was to compare TIVA (total intravenous anesthesia) with protocol/remifentanyl and anesthesia with desflurane/fentanyl in open hemicolectomy surgery. The primary endpoint hemodynamic stability was evaluated as number of dose-adjustments due to responses to surgery (hypertension, tachycardia, somatic or autonomic responses). Catecholamine levels, recovery times after anesthesia, postoperative variables and costs were also evaluated. The conclusion was that hemodynamic stability is not different between the two types of anesthesia in patients undergoing open hemicolectomy. TIVA [2, 50] reduces catecholamine levels and increases postoperative analgesic demands and costs.

An experiment was done to evaluate the effects of vasoactive drugs, specifically low-dose vasopressin and phenylephrine infusions, on blood loss / transfusion requirements during dissection and a hepatic [3,54] (pre-reperfusion) stages of orthotopic liver transplantations. The result suggests that the decrease in blood loss in the vasopressin group may be attributed to the use of a vasopressin infusion. A low-dose (0.04U/min) vasopressin infusion may be an effective technique for blood loss reduction during the pre-reperfusion stages in orthotopic liver transplantation.

Now Anesthesiologists are reluctant to considerer higher levels for spinal anesthesia largely due to direct threats to spinal cord. Paresthesias [4,34,48,52] are relatively common during spinal needle insertion; however, the clinical significance of the paresthesia is unknown. The main objective of this study was to evaluate the incidence of paresthesia and neurologic complications after lower thoracic spinal anesthesia with a cut needle compared to a pencil point needle. The data suggests that all transient paresthesia are transitory. Lower thoracic injection is safe. Traumatic injury to the spinal cord is a rare cause of neurologic deficits in the thoracic puncture.

Respiratory impairment is common in the preoperative [5,30-36] period, especially in the obese. In this study it evaluated the impact of anesthesia related factors, use of neuromuscular blocking agents, choice of anesthesia maintenance, duration of surgery and patient related factors such as age, gender and body-mass index on postoperative pulse oximetry and lung function in the obese. The result cited that Anesthesia related factors rather than patient related factors exhibit a greater effect on lung function impairment within the immediate postoperative period. Lung function impairment occurs independently

from fast-track criteria and can be attenuated by choosing well predictable agents for general anesthesia.

Post intubation croup is a serious complication among pediatric population, frequently necessitating reintubation. It is a potential threat to any child anesthetized with endotracheal intubation. It is characterized by hoarseness, stridor and severe upper airway obstruction. A case study was done about the management of post intubation croup in a 10-month-old infant with Down syndrome (DS) [6,38]. While it has been recognized that children with DS tend to develop obstruction of the upper airway postoperatively, debate remains concerning the appropriate management in this situation. The result suggests that the management of postextubation croup can be done using intravenous dexamethasone and low dose nebulizer epinephrine in a 10-month-old infant with Down syndrome (DS) operated for bilateral undescended testis.

In the last several years, EGAs [7,43] have evolved tremendously. There are now several disposable devices available which offer excellent seal pressures and the ability to easily pass a gastric tube. These include the Esophageal-Tracheal Combitube, EasyTube, LMASupreme and King LTS-D. Here, we describe a novel approach to emergent intubation of the hypoxemic patient. This approach involves using Rapid Sequence Airway with an extraglottic airway for planned positivepressure pre-oxygenation and gastric decompression as a bridge to safer intubation. This technique warrants further evaluation.

Guadeloupe [8] is characterized by one of the higher prevalence of prostate cancer in the world. In French Caribbean regions, 48.3% of women and 55.6% of men above 50 years suffer from hypertension. Abstract In hypertensive patients undergoing general anesthesia, elevated pulse pressure (PP) (>60 mmHg) and/or diastolic dysfunction (DD) could be risk factors for intraoperative hemodynamic instability. The aim of this study was to investigate, during general anesthesia, the contribution of DD and/or preoperative PP with the occurrence of hemodynamic instability during urologic surgery, which were brought about by induction of anesthesia or by the operative procedure itself.

The incidence of obesity is increasing in Europe and Asia as well as in the United States. The significant rise in childhood obesity predicts that this problem will continue for the foreseeable future. Since the overweight population represents a large segment of the surgical caseload it presents significant challenges to the anesthesia care team

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Received November 22, 2011; Accepted December 27, 2011; Published January 05, 2012

Citation: Swati Srabani N, Mohammad Abbas Q, Naresh Kumar R (2012) Anesthesia and Intensive Care. J Anesthe Clinic Res S3:004. doi:10.4172/2155-6148.S3-004

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particularly during endotracheal intubation. Bariatric surgeons are becoming more knowledgeable regarding the importance of the HELP [9,34] position and anesthesiologists will continue to seek safe, efficient and dependable alternatives to using blankets and elevation pillows will be available. Hence it is advisable to place obese patients with coexisting OSA in the HELP position in the following situations: prior to induction of general or MAC anesthesia and prior to the placement of an ETT or LMA; prior to emergence from general anesthesia; prior to extubation or LMA removal; and during the post anesthesia recovery period as indicated.

Many studies have indicated that local anesthetics are cytotoxic and can induce apoptosis; however, the types of local anesthetics and the induction rates of apoptosis remain unclear. The aim of this study was to clarify the local anesthetics that induce apoptosis or necrosis and their induction-related factors. The results indicate that local anesthetics with high lipophilicity are highly toxic and induce mainly necrosis [10,44,31], while local anesthetics with low pKa induce more apoptosis.

A case study was done by taking 92 patients to determine the most effective route of midazolam administration in children prior to surgery to produce a cooperative patient. Children receiving midazolam by the rectal route were more cooperative than the nasal or oral groups during administration of midazolam, at separation and at induction. The rectal group had similar cooperativeness to baseline at administration, while the nasal and oral groups were less cooperative at administration than at baseline. The result suggested that in children undergoing surgical procedures under general anesthesia, rectal administration of midazolam [11,32], compared to oral or nasal routes, is better tolerated and more effective at alleviating preoperative uncooperativeness.

Fractures around the hip joint are associated with considerable moderate to severe pain. Adequate preoperative analgesia in these patients is difficult to assess and often an overseen aspect of their care. A case study was done by taking 60 patients to assess the efficacy of adding clonidine [12,27,29,46] as adjuvant in fascia iliaca compartment block (FICB) in relieving pain and increasing the pain free duration in the preoperative period. The results suggest that 100µg clonidine is superior to 50µg clonidine and the control group and is the appropriate dose in fascia iliaca compartment block and provides significant benefit in terms of pain relief at rest as well as during transportation and more importantly also facilitates positioning required for proper imaging in the preoperative period.

Thymoma [13], which can be surgically treated under general anesthesia, is associated with the path physiology of myasthenia gravis. Muscle weakness is a hallmark of myasthenia gravis; therefore, these patients are hypersensitive to the effects of no depolarizing muscle relaxants. Neuromuscular blockers can cause prolonged postoperative muscle relaxation, leading to decreased respiratory function. Hence neuromuscular antagonist, Sugammadex, has been used to counteract problems associated with muscle relaxants. Sugammadex should be administered postoperatively, so that it would be safe to use in patients with myasthenia gravis, and may effectively reduce the risk of postoperative respiratory complications.

The case series that includes 14 patients illustrates the spread of local anesthetic resulting from a standardized single injection technique of intermediate cervical plexus block before carotid endarterectomy [14]. The result suggests that Intermediate cervical plexus block is associated with an extensive spread of injectate that transverses the deep cervical fascia. The distribution pattern and the sensory and motor blockade

level of this intermediate cervical plexus block seems to be sufficient for surgery and is of minor risk compared to the deep cervical plexus block.

Less is known about prevalence of postoperative cognitive dysfunction after neurosurgical procedures. The aim of this study was to assess effects of anesthetics on neurocognitive [15] function in patients undergoing interventional procedure in neuroradiological suite. It was observed that anesthetic technique did not affect post embolization cognitive function, but, a better hemodynamic stability was maintained with total intravenous anesthesia.

The aim of the study is to evaluate the effect of combination of nitroglycerin and lornoxicam on nociception and antioxidative system in rats, by taking 39 Wistar male rats as sample. Finally result showed that Nitroglycerin enhances the antioxidative effects of lornoxicam for antinociception [16,33,45] but different mechanisms might also play a role on antinociception. Further studies must be carried out with experimental models and different drug doses to reach an ultimate conclusion.

Pain following intravenous injection of propofol continues to be an intriguing problem. None of the commonly used methods completely attenuate the pain. Inflammatory response to propofol contributes to the pain. Role of hydrocortisone in attenuating pain has not been evaluated. A study was conducted to compare the efficacy of lignocaine [17] and hydrocortisone in attenuation of pain following intravenous injection of propofol. The result showed that use of intravenous low dose hydrocortisone pretreatment of the vein does not attenuate pain following propofol injection.

The use of opioids, which provide adequate pain control, is associated with a high incidence of nausea and vomiting, and this association is dose-dependent. Recent analgesic techniques use analgesic with different mechanisms of action to improve postoperative pain relief and reduce opioids requirements, and opioids-related adverse effects. Studies suggest that the use of low dose of S(+)-ketamine, a nonspecific blocker of NMDA [18] receptors, may reduce the need for opioids and opioid-related adverse effects. The purpose of this study was to evaluate in a double blind randomized trial the analgesic and adverse effects of S(+)-ketamine in a patients undergoing laparoscopic cholecystectomy.

To compare the quality of perioperative analgesia provided by levobupivacaine 0.5% and ropivacaine 0.5%, by taking 35 patients undergoing shoulder arthroscopy and thirty-six patients undergoing anterior cruciate ligament (ACL) reconstruction[19]. The result suggested that time to onset of anesthesia, intraoperative and postoperative opioid requirements, duration of postoperative analgesia, and overall patient satisfaction were similar between patients who received levobupivacaine and those who received ropivacaine. The study demonstrates that levobupivacaine and ropivacaine produce comparable postoperative analgesia when used for interscalene and femoral nerve blocks.

Adequate postoperative pain relief is one of the commonest challenges faced by women who deliver by caesarean section. This study was aimed at finding out the effect of pre-incisional administration of low dose intravenous ketamine on the post-operative analgesia demand time, by taking 80 women. The result depicted that the pre-incisional administration of low-dose intravenous ketamine [20] only demonstrated a delayed time to first analgesic request in the women who had plain bupivacaine/fentanyl spinal anesthesia and not a pre-emptive analgesic effect.

Intrathecal opioids have been used for many patients undergoing surgical operations to improve clinical outcomes. Cardiopulmonary bypass in patients undergoing coronary artery bypass graft surgery carries a number of drawbacks, namely hemodynamic derangements. Several methods have been used to suppress this state; among them is sympathetic blockade by neuraxial anesthesia. This study assesses the effect of intrathecal adjuvant bupivacaine plus sufentanil on intraoperative hemodynamic changes in elective coronary artery bypass surgery. The result depicts that administration of intrathecal sufentanil plus bupivacaine seems to keep the hemodynamic status of the patients more stable than intrathecal sufentanil [21] alone.

Residual neuromuscular blockade (NMB) [22] is associated with increased risk of post-operative critical respiratory events. This study includes comparison incidence of residual NMB at tracheal extubation after reversal of rocuronium-induced NMB with sugammadex versus neostigmine. The result showed significantly more sugammadex-treated patients recovered to a TOF ratio ≥ 0.9 at extubation and did so significantly faster than neostigmine-treated patients. This study confirms that sugammadex is more effective than neostigmine in reducing potential for residual blockade in the absence of objective NMB monitoring.

This case study includes about a woman with history of dysphasia [23] underwent an elective surgery for cervical lymph node excision. After anesthesia induction and muscle relaxation, mask ventilation was moderately difficult and direct laryngoscopy showed an extremely swollen and deformed epiglottis and throat, with no clear view of the vocal cords. Utilizing supraglottic jet ventilation, we intubated this patient quickly, smoothly and successfully, without any obvious complications. Difficulties and/or failures in tracheal intubation is still one of the major causes of morbidity and mortality related to the practice of anesthesia and critical care. It has been noted that the, "cannot ventilate/intubate" emergency airway may be responsible for up to 28% of all deaths associated with anesthesia practice. Now the new SJV technique that have been introduced is expected to reduce the chance of the "cannot ventilate and cannot intubate" emergent difficult airway as patients was oxygenated and ventilated through SJV rather than a mask, and theoretically reduce morbidity and mortality related to difficult airway management.

Intermittent technique of labor epidural analgesia [24] has been showing promising results over other techniques. This study was to assess and compare efficacy of two different doses of fentanyl mixed with low doses of bupivacaine in intermittent labor epidural analgesia. The result showed that addition of fentanyl (2 μ g/ml) to bupivacaine 0.125% decreases the time of onset of analgesia and increases the duration of analgesia and level of maternal satisfaction during labor as compared to fentanyl (1 μ g).

An experiment was done to examine the optimal concentration of sevoflurane [25] to prevent cardiovascular depression after induction of general anesthesia with remifentanyl and propofol. The result suggested that an end-tidal sevoflurane concentration of 1% was sufficient when general anesthesia was induced with an effect-site concentration of remifentanyl of 6.0 ng/mL and propofol of 1 mg/kg.

An experiment was done to determine if the irrigation of the breast cavity with local anesthetics in patients who undergo breast augmentation surgery reduces rescue analgesic requirements and postoperative pain intensity level, measured with the visual analogue scale (VAS) [26]. The result depicted that local anesthetic irrigation in

patients who underwent breast augmentation surgery reduces opioid rescue analgesia requirements and postoperative pain intensity level.

Many analgesic modalities have been employed with limited success to alleviate the pain associated with botulinum [52] toxin type A (BTX-A) injections. Vibration is a safe and effective means of reducing patient discomfort during BTX-A injections for cosmetic rhytid reduction and may have applications in other cosmetic procedures.

The topical application of IRS 19 [53] and imudon bacterial lysates during the postoperative period after adenotonsillectomy produces the well-apparent therapeutic effect and considerably improves the quality of surgical treatment of the patients.

Acceleromyography [54] monitoring reduces the incidence of residual blockade and associated unpleasant symptoms of muscle weakness in the PACU and improves the overall quality of recovery.

As anesthetic drugs [55] are given at a point of potentially high vulnerability in terms of dissemination and establishment of metastases there is an urgent need to determine the most appropriate anesthetic strategy for surgical oncology so that the optimal techniques are employed to maximize long-term survival.

The risk for PNI after THA was not increased with the use of neuraxial anesthesia [56] or peripheral nerve blockade. Neurologic recovery in patients who experienced PNI was not affected by the use of RA. These results support the use of RA techniques in patients undergoing elective THA given their known functional and clinical benefits.

In patients undergoing lower extremity surgery with spinal anesthesia, the addition of 100 mg IT MgSO₄ to 15 mg bupivacaine [57] without opioid supplement, prolonged the duration of the sensory block, decreased postoperative analgesic consumption, and significantly prolonged the onset of spinal anesthesia.

The mandibular infiltration [58] anesthetic technique is an effective method of anesthetizing mandibular incisors. Four percent articaine with epinephrine appears to be the preferred solution. The choice of anesthetic solution is important when using the infiltration anesthetic technique in the adult mandible.

A study demonstrated no clinical benefit to adding i.v. parecoxib [59] to local anaesthetic scalp infiltration, i.v. paracetamol, and patient-controlled i.v. morphine after supratentorial craniotomy.

Autopsy findings [60] were more often helpful than harmful in the medicolegal defense of anesthesiologists. Autopsy identified a significant nonanesthetic contribution to death in two thirds of claims with evaluable autopsy information.

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