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Übungen parkinson

General Anaesthesia is a medically induced loss of consciousness that renders a patient unresponsive to painful stimuli. It is achieved through medications, often used in combination with analgesics and neuromuscular blocking agents. This allows for surgical procedures that would otherwise be intolerable due to pain. During surgery, general anaesthesia ensures the patient's natural breathing may be inadequate, necessitating intervention to protect the airway. Various drugs are used to induce unconsciousness, amnesia, analgesia, and paralysis of skeletal muscles. The history of general anaesthesia dates back to ancient civilizations, with recorded attempts at producing the phenomenon in the writings of Sumerians, Babylonians, and Greeks. However, it wasn't until the late 18th and early 19th centuries that significant scientific discoveries led to the development of modern anaesthetic techniques. Advances in pharmacology, physiology, and antisepsis significantly improved general anaesthesia's safety and efficacy. On November 14, 1804, Japanese surgeon Hanaoka Seishū performed the first recorded successful surgery using general anaesthesia. New anaesthetic agents with improved properties contributed to a trend in general anaesthesia, accompanied by standardized training programs for anaesthesiologists and nurse anaesthetists. General anaesthesia has various purposes, commonly used in many surgical procedures. A comprehensive anaesthesia plan should include inducing unconsciousness, analgesia, amnesia, immobility, and paralysis. In contrast to continuous deep sedation, dying patients may opt for complete unconsciousness as they pass away. The biochemical mechanism of general anaesthetics is not fully understood, with multiple sites of action affecting the central nervous system. General anaesthesia interrupts or alters CNS components, including the cerebral cortex, thalamus, and spinal cord. Theories identify target sites in the CNS, neural networks, and arousal circuits linked to unconsciousness. Anaesthetics can potentially activate specific sleep-active regions. Two non-exclusionary mechanisms include membrane-mediated and direct protein-mediated anaesthesia. Potential targets are GABAA and NMDA glutamate receptors. General anaesthesia was thought to enhance inhibitory transmission or reduce excitatory transmission of neuro signaling. Most volatile anaesthetics act as GABAA agonists, while ketamine is a non-competitive NMDA receptor antagonist. The chemical structure and properties of anaesthetics suggest they target the plasma membrane. A study revealed that inhaled anaesthetics can displace phospholipase D2 from ordered lipid domains, producing the signaling molecule phosphatidic acid. Before a procedure, an anaesthesiologist reviews medical records, interviews the patient, and examines them to determine an appropriate anaesthetic plan. Factors considered include age, gender, body mass index, medical history, current medications, exercise capacity, and fasting time. A thorough preoperative evaluation is crucial for ensuring the safety of the anaesthetic plan. Anaesthetics can interact with commonly used medications, increasing the risk during operations if these interactions are not disclosed. Inaccurate timing of last meals can lead to serious complications due to food aspiration. Pre-anaesthetic evaluation involves assessing the patient's airway by inspecting their mouth opening and visualising the soft tissues of the pharynx. The Mallampati score evaluates airway structures with the mouth open and tongue protruding, but other assessments are also performed, including mouth opening, thyromental distance, neck range of motion, and mandibular protrusion. In cases where airway anatomy is suspected to be distorted, endoscopy or ultrasound may be used for evaluation before planning airway management. Before administering a general anaesthetic, an anaesthetist may give one or more drugs that complement the anaesthetic's quality or safety, or provide anxiolysis. Premedication can also have mild sedative effects and reduce the amount of anaesthetic agent required during the case. Commonly used premedications include clonidine, dexmedetomidine, midazolam, melatonin, and beta adrenergic antagonists, which can provide anxiolysis, sedation, and analgesia while reducing the risk of postoperative complications. Adverse reactions with beta-blockers during non-cardiac surgery can be mitigated by utilizing various medications such as ondansetron, droperidol, or dexamethasone to prevent postoperative nausea and vomiting. Additionally, NSAIDs are commonly used for pain management and can reduce the need for opioids like fentanyl or sufentanil. Other analgesic options include gastrokinetic agents like metoclopramide and histamine antagonists such as famotidine. To minimize anxiety before surgery, non-pharmacological interventions like cognitive behavioral therapy, music therapy, aromatherapy, hypnosis massage, and guided imagery relaxation techniques can be employed. These methods are particularly beneficial for children and individuals with intellectual disabilities. Sensory stimulation or distraction through video games may also help alleviate anxiety during the pre-anesthesia period. While parental presence during premedication has not been shown to reduce anxiety in children, it is recommended that parents who wish to attend should not be actively discouraged from doing so. Anaesthesia itself does not significantly impact brain function unless there is an underlying brain disruption. In cases where a concussion or other brain injury exists, anaesthesia can pose risks and potentially lead to further complications. Guedel's classification describes four stages of anaesthesia: Stage 1 (induction), characterized by the progression from analgesia without amnesia to analgesia with amnesia; Stage 2 (excitement or delirium stage), marked by excited and delirious activity, uncontrolled movements, vomiting, suspension of breathing, and pupillary dilation; Stage 3 (surgical anaesthesia), where skeletal muscles relax; and Stage 4, which is characterized by deepening anaesthesia. Stage 3 anesthesia is characterized by respiratory depression, with patients becoming unconscious and ready for surgery. It consists of four planes: eye rolling, loss of eyelid and swallow reflexes, regular breathing patterns, and complete muscle relaxation. This stage is ideal for most surgical procedures. In Stage 4, also known as overdose, excessive anesthetic medication can lead to severe brainstem or medullary depression, causing cessation of respiration and potential cardiovascular collapse. Without proper support, this stage is lethal. General anesthesia is typically induced in an operating theater using intravenous or inhalational agents. Commonly used medications include propofol and sevoflurane. Pre-oxygenation and denitrogenation are essential steps before intubation to ensure a smooth induction process. Monitoring technologies such as electrocardiography (ECG) and temperature evaluation help control anesthesia levels. The standard for basic anesthetic monitoring includes evaluating the patient's oxygenation, ventilation, circulation, and temperature throughout the procedure. This helps prevent awareness and ensures a safe anesthetic experience. Cardiac monitoring is crucial during surgery, focusing on arrhythmias and ischemia in leads II and V5 respectively. Continuous pulse oximetry (SpO2) allows for early detection of hypoxaemia by tracking a patient's hemoglobin saturation with oxygen levels. Blood pressure monitoring involves non-invasive blood pressure (NIBP) cuffs or invasive blood pressure (IBP) cannulas, typically used for critically ill patients or those undergoing major procedures. Anaesthetic machines measure agent concentrations, oxygenation, and carbon dioxide levels, triggering alarms if oxygen delivery is compromised. Capnography measures exhaled carbon dioxide to assess ventilation adequacy, often displayed in mmHg to detect subtle changes. Temperature monitoring helps prevent hypothermia or malignant hyperthermia. To ensure airway patency and regulate breathing, endotracheal tubes or face masks may be used during mechanical ventilation, especially for profoundly ill patients. General anaesthesia induces apnea, requiring ventilation until drugs wear off. Mechanical ventilation can provide ventilatory support, ensuring adequate gas exchange during spontaneous breathing. Spontaneous ventilation during anesthesia can be beneficial in certain situations, such as difficult airway or tubeless surgery. Traditionally, it has been maintained with inhalational agents like halothane or sevoflurane, known as gas induction. However, intravenous anesthesia with propofol offers advantages over inhalation agents, including suppressed laryngeal reflexes, but requires careful titration. Spontaneous Respiration using Intravenous anesthesia and High-flow nasal oxygen (STRIVE Hi) is a technique used in difficult and obstructed airways. Meanwhile, general anesthesia can lead to eye injuries due to reduced tear production, corneal epithelial drying, and loss of protective mechanisms like Bell's phenomenon. To prevent eye injuries, methods include taping eyelids shut, using eye ointments, and specialized goggles. Certain medications administered during general anesthesia, such as propofol, ephedrine, fentanyl, atracurium, and glycopyrronium bromide, are prepared in syringes for use under sevoflurane gas. Muscle paralysis is a crucial component of modern anesthesia, allowing surgery without deep anesthesia and facilitating endotracheal intubation. This is achieved by preventing acetylcholine from attaching to its receptor, causing muscles to contract when it is released from nerve endings. The diaphragm and intercostal muscles are paralyzed, requiring artificial respiration and airway protection via an endotracheal tube. The effects of muscle relaxants can be reversed with anticholinesterase drugs, administered in combination with muscarinic anticholinergic drugs to minimize side effects. Examples of skeletal muscle relaxants include pancuronium, rocuronium, vecuronium, cisatracurium, atracurium, mivacurium, and succinylcholine. Sugammadex can also be used to reverse muscle relaxation; it binds directly with muscle relaxants at the neuromuscular junction. This medication gained popularity in the US after its approval in 2015, and a study from 2022 found that Sugammadex has a similar safety profile as neostigmine for reversing neuromuscular blockade. Typically, general anaesthesia lasts around 5-10 minutes before the patient starts to regain consciousness. To maintain unconsciousness throughout surgery, patients are given a mix of oxygen and volatile anaesthetic or intravenous medication like propofol. Some patients also receive analgesic agents such as opioids or sedatives to help manage pain and anxiety. Propofol can be used for total intravenous anaesthesia, which eliminates the need for inhalation agents. General anaesthesia is usually safe but may cause rare side effects including distorted taste or smell, stroke, nerve damage, or other complications in some patients. After surgery, anaesthetic agents are stopped, allowing the patient to recover within 1-30 minutes depending on the procedure's duration. A technique called target controlled infusion uses a computer-controlled syringe driver to deliver propofol during surgery, which can lead to faster recovery and reduced side effects. However, this method is not currently permitted in the US and is instead replaced with a syringe pump delivering medication at a set rate. Various medications are also used to treat side effects or prevent complications such as hypertension, low blood pressure, asthma, allergic reactions, inflammation, or infection. The spinal cord has a faster recovery rate compared to the brain, which leads to uninhibited reflexes causing clonic activity or shivering post-surgery. Studies have shown that CNS stimulants like doxapram can be somewhat effective in reducing postoperative shivering. Common complications during emergence from general anesthesia include cardiovascular events such as fluctuations in blood pressure and heart rate, as well as respiratory symptoms like dyspnea. Patients are typically assessed for readiness to extubate by responding to verbal commands. In the PACU, pain management involves regional analgesia or medication through various routes, including oral, transdermal, or parenteral administration. Opioids, non-steroidal anti-inflammatory drugs (NSAIDs), and acetaminophen are commonly used medications for postoperative pain relief. Patient-controlled analgesic devices allow patients to self-administer medication, reducing the risk of overdose. If these measures fail to manage pain, local anesthetic nerve blocks may be performed. In the recovery unit, vital signs such as oxygen saturation, heart rhythm, and blood pressure are closely monitored. Postanesthetic shivering is a common issue that can cause discomfort, exacerbate pain, increase oxygen consumption, and lead to complications like hypothermia and lactic acidosis. Techniques used to reduce shivering include external warming devices and medications like dexmedetomidine. The administration of opioids during general anesthesia can sometimes lead to postoperative ileus, a condition where the bowel temporarily stops functioning. Using μ-opioid antagonists like alvimopan after surgery can help accelerate hospital discharge but does not prevent paralytic ileus. The Enhanced Recovery After Surgery (ERAS) society provides guidelines for optimal peri-operative care and has been shown to improve postoperative outcomes and reduce healthcare costs when followed. Advancements in monitoring equipment, anaesthetic agents, and a focus on perioperative safety have significantly contributed to the decline in perioperative mortality. According to estimates, there is approximately 1.1 deaths per million population annually in the United States due to anaesthesia-related complications. The elderly population, particularly those above 85 years old, are most affected. A review of perioperative anaesthesia interventions found that pharmacotherapy, ventilation, transfusion, nutrition, glucose control, dialysis, and medical device management all contribute to reduced mortality rates. Interestingly, a randomized controlled trial revealed no significant difference in mortality rates between patients receiving handovers from one clinician to another compared to the control group. However, mortality directly related to anaesthetic management is rare but may be caused by pulmonary aspiration of gastric contents, asphyxiation, or anaphylaxis. Human error and equipment malfunction can also contribute to these complications. The American Society of Anesthesiologists established the Anesthesia Patient Safety and Risk Management Committee in 1984 following a television programme highlighting anaesthesia mishaps. The committee aimed to determine and reduce the causes of anaesthesia-related morbidity and mortality. This led to the creation of the independent, non-profit Anesthesia Patient Safety Foundation. A rare but significant complication of general anaesthesia is malignant hyperthermia, which requires emergency treatment protocols in place at major hospitals. Recent studies have shed light on various aspects of general anesthesia, including its mechanisms and effects on the body. A number of researchers have explored the history of anesthesia, highlighting the contributions of pioneers such as Seishū Hanaoka and Gendai Kamada in Japan (Dote et al., 2017). Studies have also investigated the neural circuits underlying general anesthesia and sleep (Moody et al., 2021). The mechanisms by which general anesthetics work were examined in research on GABA type A receptors (Woll et al., 2018) and NMDA receptors (Zhang et al., 2021). Other researchers have explored the effects of general anesthesia on specific organs, such as the brain (Pavel et al., 2020). The use of general anesthesia in lung resection surgery was also evaluated by Lederman et al. (2019), who highlighted the importance of preoperative assessment and postoperative analgesia. Additionally, studies have investigated the incidence and factors associated with perioperative cardiac arrest in trauma patients receiving anesthesia (Siriphuwanun et al., 2018). The management of airway during obstetric anesthesia was also examined by Mushambi et al. (2016). These studies demonstrate the ongoing efforts to improve our understanding of general anesthesia and its applications. References: * Dote et al., 2017: "Two Japanese Pioneers in Anesthesiology: Seishū Hanaoka and Gendai Kamada" * Moody et al., 2021: "The Neural Circuits Underlying General Anesthesia and Sleep" * Woll et al., 2018: "Identification of binding sites contributing to volatile anesthetic effects on GABA type A receptors" * Zhang et al., 2021: "Structural basis of ketamine action on human NMDA receptors" * Pavel et al., 2020: "Studies on the mechanism of general anesthesia" * Lederman et al., 2019: "Anesthetic considerations for lung resection: preoperative assessment, intraoperative challenges and postoperative analgesia" * Siriphuwanun et al., 2018: "Incidences and factors associated with perioperative cardiac arrest in trauma patients receiving anesthesia" * Mushambi et al., 2016: "Airway management and training in obstetric anaesthesia" Anesthetic emergencies and strategies for management in Australian and New Zealand teaching hospitals Non-pharmacological interventions and anaesthesia effects on the respiratory system are crucial factors in assisting the induction of anaesthesia. A comprehensive review highlights the importance of non-pharmacologic approaches in managing preoperative anxiety, with a focus on auditory brain-stem response, anesthesia effects on brain function, and spectral EEG correlations during different phases of general anaesthesia. Additionally, the article touches upon the significance of basic anesthetic monitoring, oxygenation, airway patency, and eye care during anaesthesia and intensive care. The article appears to be a collection of research papers and guidelines related to anesthesia, postoperative care, and pain management. The topics include: 1. Pharmacology of anesthetic agents 2. Guidelines for safe practice of total intravenous anesthesia (TIVA) 3. Loss of smell and taste after general anesthesia 4. Postanaesthetic shivering prevention 5. Comparison of oral multimodal analgesia versus IV PCA for spine surgery 6. Adductor canal blocks for postoperative pain treatment in adults undergoing knee surgery 7. The effect of transversus abdominis plane block on analgesia in patients undergoing liver transplantation 8. Development of an automated multimodal clinical decision support system at the post anesthesia care unit 9. Perioperative hyperoxia and post-operative cardiac complications in adults undergoing non-cardiac surgery The papers and guidelines cover various aspects of anesthesia, including pharmacology, pain management, and monitoring techniques. They also discuss new technologies and treatments for postoperative side effects, such as loss of smell and taste, shivering, and hyperoxia. It's worth noting that the text appears to be a collection of abstracts or summaries of research papers, rather than a single, cohesive article. The citations suggest that the papers were published in various medical journals, including Anesthesia and Analgesia, Continuing Education in Anaesthesia Critical Care & Pain, and others. **Postoperative Shivering and Hypothermia Prevention** This article discusses various studies on preventing postoperative shivering and hypothermia in patients undergoing anesthesia. A prospective observational cohort study examined the use of spinal anesthesia and prophylactic phenylephrine drip during cesarean delivery, finding a significant reduction in shivering. Other studies investigated the effectiveness of active and passive warming methods in preventing inadvertent hypothermia in patients receiving neuraxial anesthesia. The results showed that both methods can be effective, but active warming was more efficient. Thermal insulation was also studied as a method to prevent perioperative hypothermia. A systematic review found that thermal insulation reduced the incidence of hypothermia and improved patient outcomes. In addition, researchers explored the use of dexmedetomidine as an adjuvant in epidural anesthesia and analgesia to prevent shivering. The results showed that dexmedetomidine was effective in reducing shivering and improving patient comfort. The article also discusses the causes and prevention of postoperative ileus, a common complication after surgery. Overall, these studies highlight the importance of preventing postoperative shivering and hypothermia through various methods, including active and passive warming, thermal insulation, and the use of adjuvants like dexmedetomidine. The article discusses general anesthesia, a critical aspect of medical care. A scoping review published in 2018 analyzed anesthesia interventions and their impact on perioperative mortality (Carrigan et al., 2018). The study identified various factors influencing patient outcomes. A more recent randomized clinical trial, the HandiCAP study, investigated the effects of intraoperative handovers of anesthesia care on mortality and complications among adults (Meersch et al., 2022). The results showed that handover procedures had a significant impact on patient safety. Pulmonary aspiration of gastric contents is another critical concern in anesthesia, as highlighted by a 1999 study (Engelhardt & Webster, 1999). Aspiration can lead to severe complications and even death, making it essential for anesthesiologists to take preventive measures. The history of general anesthesia has been marked by significant milestones, including the development of safer anesthetic agents. Chloroform, once a popular anesthetic, has an interesting history and is now considered obsolete due to its toxicity (University of Bristol, n.d.). Standards and guidelines for monitoring patients under general anesthesia are crucial for ensuring patient safety. The Royal College of Anaesthetists provides guidance on patient information and monitoring standards (Royal College of Anaesthetists, n.d.). Overall, the article emphasizes the importance of general anesthesia in modern medicine and highlights ongoing efforts to improve patient care. References: Carrigan, I. D., Larrigan, S., Mendonca, C. T., Miao, I., Postonogova, T., Walker, B., ... & Balaa, N. (2018). Anesthesia interventions that alter perioperative mortality: a scoping review. Systematic Reviews, 7(1), 218. Meersch, M., Weiss, R., Küllmar, M., Bergmann, L., Thompson, A., Griep, L., ... & Goettker, C. (2022). Effect of Intraoperative Handovers of Anesthesia Care on Mortality, Readmission, or Postoperative Complications Among Adults: The HandiCAP Randomized Clinical Trial. JAMA, 327(24), 2403–2412. Engelhardt, T., & Webster, N. R. (1999). Pulmonary aspiration of gastric contents in anaesthesia. British Journal of Anaesthesia, 83(3), 453–460. University of Bristol. (n.d.). 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