

General anesthesia and its complications

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Introduction:

The use of anesthetics has greatly improved the quality of life for patients undergoing surgery and other medical procedures by reducing or eliminating their perception of pain. The hazards of anaesthesia are the same as those of any medical procedure. Healthcare personnel need to be knowledgeable in recognizing and treating anaesthesia-related complications, which can be anything from minor to fatal (Wasnik, M., et al., 2020).

Local, regional, and general anesthesia are the three most common forms. For smaller surgical procedures, such as those involving a tooth or a finger, local anesthesia is used to numb the area. An injection or catheter can be used to give regional anesthesia, which numbs a wider portion of the body, like an arm or a leg. The most frequent kind of anesthesia, known as general anesthesia, causes the patient to become asleep and numb.

General anesthesia involves the administration of anesthetics through the infusion method to induce drowsiness. As the anesthetics weaken your breathing, we initially administer oxygen through an oxygen mask to both your mouth and nose. Afterwards, we transition to mechanical ventilation by delivering oxygen through a tube inserted into your trachea, passing through the mouth and vocal cords. This ensures a stable support for your breathing. While undergoing surgery, you will be in a state of unconsciousness, rendering you unable to perceive any discomfort. Upon cessation of anesthetic administration after the conclusion of the surgical procedure, you will commence the process of regaining consciousness from the anesthesia.

Occurrence of consciousness while under general anesthesia, albeit infrequent, can be an extremely distressing encounter for patients. Anesthesia awareness is the phenomenon in which a patient awakens and becomes cognizant of their environment while undergoing surgery. The circumstances contributing to awareness can be many, encompassing equipment malfunction, insufficient dosage, or patient-specific variables. Prevention: Regularly inspect and calibrate monitoring devices. Furthermore, the utilization of depth of anesthesia monitors and customizing anesthesia dosages based on the specific requirements of each patient can effectively mitigate the likelihood of consciousness during surgery. Patients who have

surgery and become conscious during the procedure may endure psychological distress (Wasnik, M., et al., 2020).

Kindly acknowledge the anesthesiologist's communication, as we will proceed to remove the tracheal tube once we have verified your ability to reply to your name being called by opening your eyes, as well as your capacity to follow directions by opening and closing your fist. The anesthesiologist consistently modifies the dosage of anesthesia during surgery to ensure that you remain unconscious until the completion of the surgical procedure. If your preoperative health is suboptimal, the recovery time from anesthesia may be prolonged. Nonetheless, it is highly atypical for a patient to remain unconscious due to the effects of anesthetic (Brown, E. N., et al., 2018).

The number of facilities offering anesthesia for GI endoscopic operations has grown substantially in recent years (Liu, H., et al., 2012). A small percentage of endoscopic operations were done under anesthesia prior to 2004. Thirty to 35 percent of colonoscopies and upper-end occupiers included anaesthesia-directed sedation (ADS) in 2009, and that number rose to 50 percent by 2012 (Khiani, V. S., et al., 2012). Whether ADS is linked to more problems than endoscopes-directed moderate sedation is unclear, despite the rising use of anaesthesia services and protocol in endoscopic operations (Hirshman, S., et al., 2017).

There is an elevated risk of perioperative problems in patients who have respiratory diseases. After surgery, most complications manifest as a result of insufficient lung expansion, shallow breathing, basal lung collapse, and infection. These patients should be identified before surgery and their lung function should be optimized to reduce the risk of problems. This may necessitate the assistance of a respiratory physician and includes physiotherapy as well as an evaluation of all drugs. Until the patient is prepared, elective surgery will not be performed. Pulmonary problems occur most frequently (10-40%) in patients undergoing general surgery after thoracic and upper abdominal operations. Consequently, the potential advantages of the procedure must be considered in relation to the potential hazards (Mercer, M., 2000)

Types of anesthesia:

There exist two distinct forms of anesthesia: general anesthesia and local anesthesia. The anesthesiologist determines the method of anesthesia based on factors such as the nature, duration, and location of the

surgery, the results of preoperative tests, and the patient's age. If you have any inquiries or demands, do inform us: (Kadri, I. A., et al., 2014)

1) General anesthesia:

General anesthesia induces a state of profound unconsciousness in the patient. Due to the weakening of their respiration, the individual necessitates support through the use of artificial ventilation.

2) Local anesthesia (spinal anesthesia, epidural anesthesia, or conduction anesthesia [nerve block])

Spinal or epidural anesthesia involves the injection of anesthetics into the upper or lower back of a conscious patient in order to alleviate pain. Conduction anesthesia, also known as nerve block, involves the injection of anesthetics in close proximity to the nerve associated with the operative area in order to alleviate pain (Martin-Flores, M., 2019)

3) Combination of general and local anesthesia:

Surgeons can alleviate the physical strain of anesthetics and perform safer procedures by mixing local and general anesthesia (Samanta, S., et al., 2014).

Preparation for anesthesia:

1) Fasting before surgery:

Indigestion is a side effect of several anesthetics. When vomit gets into the airways, it can lead to breathing problems like asphyxia or aspiration pneumonia. So, to keep these complications at bay, it is imperative that you fast before being administered anesthetic. These complications are potentially fatal, so it is imperative that you adhere to our recommendations regarding the restriction of food and water consumption prior to surgery.

2) Entering an operating room:

Depending on your medical state, you may be transported to the operating room either on a bed, in a wheelchair, or by walking. Medical professionals don caps and masks in order to ensure sterility within the operation room. Upon entering the room, we will authenticate your identity by confirming both your wristband and your name. We attach electrodes from an electrocardiogram (ECG) to observe your cardiac

activity, together with a sensor to track your breathing. Subsequently, we measure your blood pressure. The electrodes and sensor are affixed to your skin. During a drip infusion, a slender indwelling catheter is often inserted into a vein in your arm. The act of inserting the object can potentially result in harm to the nearby nerve, but this is quite uncommon. Additionally, internal bleeding may occur, but it often resolves on its own over time.

Complications of anesthesia:

Post-operative nausea and vomiting:

Nausea, vomiting, sore pharynx, dental complications resulting from endotracheal intubation, shivering, and drowsiness are the most uncommon minor postoperative complications. Sickness accompanied by nausea is frequently accompanied by vomiting, or the expulsion of gastric contents. Postoperative nausea and vomiting (PONV) was observed to be more prevalent following regional anesthetic procedures as opposed to general anesthetic procedures, according to a study by Stadler, Bardiau, Seidel, Albert & Boogaerts (2003).

Between 20 and 30 percent of the total incidence occurs in the recovery room. Combined factors, including the patient's medical history, the procedure performed, the anesthetic and medication administered, and environmental elements, can contribute to postoperative nausea and vomiting. Patient variables include age, nonsmoking status, propensity for motion sickness, prior postoperative nausea and vomiting, and female gender. Use of volatile anesthetics, prolonged anesthesia and surgery duration, and post-operative opioid use are all anesthetic-related risk factors (Apfel, C. C., et al., 2012). added to the list. The utilization of volatile anesthetic agents to stimulate the brain, which results in nausea and vomiting, increases the risk of anesthesia.

Circulatory complications:

Alterations to the patient's cardiovascular function may occur as a result of general anesthesia. Hypovolemia, hypotension, and hypothermia are some of the alterations that can occur, as might myocardial infarction, heart failure, and cardiac arrest. (Harris, M. & Chung, F., 2013). Among the many forms of venous thromboembolism, including deep vein thrombosis and pulmonary embolism, surgery

and general anesthesia are among the most prominent risk factors. (Desciak, M. C., & Martin, D. E., 2011). Initiating the appropriate treatment for the patient hinges on recognizing these alterations and their underlying cause.

Pulmonary complications:

Respiration is a significant component of a surgical procedure performed under general anesthesia. The patient relies entirely on the caregivers as their respiratory system is sustained manually using respiratory devices. The administration of muscle relaxants during the induction of anesthesia causes the patient's tongue to obstruct the airways. Consequently, an intubation tube is introduced to ensure the airways remain unobstructed. Close monitoring of the patient's respiration is necessary following the procedure to ensure proper oxygenation levels and smooth breathing (Niemi-Murolo, L.2014). The goal of post-operative therapy pertaining to respiration is to achieve respiratory stability in patients.

Anaesthesia and its effects on the lungs:

Anesthesia-induced ventilation is necessary for 234 million patients annually (Weiser, T. G., et al., 2008). Efforts to lessen the load on the lungs caused by ventilation could thus be of utmost importance. Therefore, many anesthetists have started using the same ventilatory methods that are utilized in intensive care units. But it's unclear if this makes a significant impact for individuals without ARDS who need breathing for hours instead of days during surgery. When neuromuscular blockade is not necessary, ventilatory modes such as combined assist/controlled ventilation are an option; nevertheless, volume- or pressure-controlled ventilation is far more prevalent and offers some benefits in terms of lung preservation. Because set volumes are more assured with volume-controlled ventilation, barotrauma is more readily avoided, and volutrauma is more easily avoided with pressure-controlled breathing. These days, it's much easier to keep settings in place thanks to modern systems that integrate pressure and volume control, which is particularly useful in intensive care.

Relationship with smoking and upper respiratory tract infections:

Complications during and after surgery are more likely to occur as a result of upper respiratory tract infections (URTI). Apyrexial patients with clear nasal secretions, normal SpO₂, and no respiratory

symptoms may have an exceptionally low risk of complications. PPCs are more likely to develop in patients who exhibit symptoms of illness, including purulent nasal secretions, productive cough, and chest signs; therefore, if not imperative, surgery should be delayed. Particularly when the patient's trachea is intubated, a history of asthma, paternal smoking in pediatric patients, and prematurity all contribute to an elevated risk of laryngospasm and bronchospasm, oxygen desaturation below 90%, and a higher incidence of PPCs. Respiratory complications caused by reactive airways may persist even after recovery from a URTI, both during and after anesthesia. Surgical intervention ought to be postponed for an additional four to six weeks, unless absolutely necessary (Mills, G. H., 2018).

Chronic respiratory diseases:

Chronic obstructive pulmonary disease has been recognized as a separate risk factor for mortality in patients with critical illness. It is also linked to a higher likelihood of needing to be re-intubated following surgery and an increase in postoperative morbidity and mortality. Prior to surgery, pre-operative therapies have the potential to enhance patients' condition. An anesthetic method can also enhance the outcome by eliminating the need for invasive postoperative breathing and utilizing localized procedures. Using epidural anesthesia as the only approach may decrease the occurrence of pneumonia by up to 50%. There have been documented case reports on the utilization of epidural and spinal anesthesia during abdominal surgery. For patients who require tracheal intubation and ventilation, it is critical to prioritize early removal of the tracheal tube and transition to non-invasive ventilation when necessary. Additionally, it is crucial to avoid air trapping and high airway pressures, as well as positive end-expiratory pressure (PEEP) in patients with large bullae. These measures are of great significance (Labaki, W. W., & Han, M. K., 2020)

Conclusion:

Anaesthesia can be utilized not only during medical procedures but also to treat chronic pain conditions. To inhibit pain signals, for instance, an anesthetic medication is injected directly into a nerve during a nerve block. Patients who are suffering from chronic pain conditions, including neuropathy, arthritis, or back pain, may find relief from this. In essence, anaesthesia is an indispensable medical procedure that ensures the safety and comfort of patients during their medical interventions. Anesthesiologists administer anesthesia and oversee patients prior to, during, and subsequent to medical procedures; their responsibilities are crucial. Risks associated with anaesthesia can be mitigated through vigilant surveillance and evaluation, thereby guaranteeing that patients are administered anaesthesia that is both safe and efficacious.

Surgery under general anesthesia is becoming safer with each passing year, but there are always potential risks that must be addressed if the patient experiences any adverse effects. Lessening of problems is possible when technology develops and new methods are utilized.

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