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ANAESTHESIA-THE PRIME IMPORTANCE OF SURGERY & FASTING REQUIREMENTS REVIEW

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ABSTRACT

Anesthesia is temporarily induced loss of sensation. It includes -analgesia(loss of pain), amnesia(loss of memory),unconsciousness (reversible loss of consciousness that is coma not sleep), paralysis(muscle relaxation).Anesthesia is given to control pain during surgery by medicines called ANESTHETICS which may have all or few of the properties mentioned above based on the type of anesthesia. Different end points for different anesthesia. This review encompasses a complete understanding of anesthesia, its types, pre anesthetic checkup, preoperative fasting, anesthesia administration, and the risk associated. **CONCLUSION:** Realizing the importance of anesthesia, and to reduce the risk associated with is important. With the complete understanding of pre-anesthetic checkup helps the patients to provide complete & correct information which helps the anesthesiologist to formulate effective anesthetic plan. Understanding of preoperative fasting the risk of aspiration pneumonia which is a life threatening condition can be minimized and excessive fasting which leads to dehydration, electrolyte abnormalities, hypoglycaemia (particularly in children), insulin resistance, headaches, confusion, irritability, anxiety and nausea and vomiting can be reduced. With complete understanding Health care professionals can cooperate with patients & the anesthesiologist to formulate effective anesthetic plan for better therapeutic outcome.

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INTRODUCTION

Types of anesthesia:

Based on the surgery anesthesia is selected :

1. Local anesthesia:

An anesthetic drug numbs specific area of the body it can be given as a shot, spray, or applied as ointment, (for example, a foot, hand, or patch of skin). With local anesthesia, a person is awake or sedated, depending on requirement of surgery. Local anesthesia lasts for a short period of time and is often used for minor outpatient procedures (when patients come in for surgery and can go home the same day). Local anesthetic used can numb the area during the procedure and for a short time after the surgery to help control post-surgery discomfort.

- outpatient surgery in a clinic or doctor's office (such as the dentist or dermatologist), this is probably the type of anesthetic used. It is also used in surgeries like stent removal, ganglion impair block, cervical cancer with anorectal pain.
- Three types of LA amide group, ester group and naturally derived. Esters are prone to producing allergic reaction and metabolized by phosphodiesterase while amide is metabolized in liver and can be considered as drug choosing factor in patients with liver failure.

2. Regional anesthesia :

An Anesthetic drug blocks pain to a larger part of your body. Regional anesthesia may also be given as medicine to relax or sleep. Types of regional anesthesia include:

Peripheral nerve blocks

An anesthetic drug is injected near a cluster of nerves, numbing a larger area of the body (such as below the waist-feet, legs or hands, arm or face). It block pain in specific nerve or group of nerve.

- Axillary Nerve Block – Local anesthetic is injected around the nerve that passes through the axilla (armpit) from the shoulder to the arm to numb the feeling in your arm and hand. Typically used for surgery of the elbow, forearm, wrist, or hand.
- Interscalene Nerve Block – Local anesthetic is injected around the nerve block in the neck used to numb the shoulder and arm. Typically used for surgery of the shoulder and upper arm.
- Femoral Nerve Block – Local anesthetic is injected around the nerve block in the upper thigh/groin area to numb the leg from the knee to the hip. Typically used from surgery of the upper leg, hip or knee.
- Ankle Block – Local anesthesia is injected around the ankle to block the five nerve branches that supply sensation to the foot. As the name indicates, used for surgery of the ankle, foot or toes.
- Bier Block – Local anesthetics are injected intravenously to numb a limb, typically the arm, and then a tourniquet is applied to prevent the anesthetic from leaving the area. Typically used on surgeries of hand or arm that last less than an hour.

Epidural and spinal anesthesia: This is a shot of anesthetic near the spinal cord and the nerves that connect to it. It is used to blocks pain from an entire region of the body, such as the belly, hips, or legs. An IV must first be inserted since these procedures require the patient to be properly hydrated. Both epidural and spinal anesthesia use a local anesthetic to numb the area where the needle is inserted. Depending on the type of surgery, patients may also be placed under general anesthesia or a mild sedative is given to relax and/or sleep.

- Epidural anesthesia is administered in the lower back/lumbar region using a special needle that is inserted between the vertebrae of the spinal column into the epidural space around the spine. Once in place, a small catheter (tube) is placed into the epidural space via the needle, and then the needle is removed, leaving the catheter in place. Local anesthetics and narcotics are then given through the catheter. The procedure usually takes 10 to 25 minutes. Because an epidural uses a catheter, pain medicine can continue to be administered to provide post-operative pain relief if needed.

Types of Procedures: Typically used for labor, cesareans (c-sections) , surgeries of the colon and gastrointestinal tract, post open reduction and internal fixation procedures, Total knee replacement, fibroid uterus with kartagenesis syndrome, open hysterectomy, fibula fixation.

- Spinal Anesthesia is administered in the lower back/lumbar region using a spinal needle that is inserted between the vertebrae of the spinal column into the dural membrane, which covers the spine and nerve roots. Once in place, medicines including a local anesthetic and sometimes a narcotic are given through the needle, and then the needle is removed. The entire process usually takes anywhere from 5 to 20 minutes.

Types of Procedures: Typically used for gynecologic (e.g. hysterectomies) and urologic (e.g. prostate) surgeries, as well as surgeries of the lower extremities (e.g. knee surgery).

Regional anesthesia is generally used to make a person more comfortable during and after the surgical procedure.

3. General anesthesia :

This mostly affects your brain and the rest of your body. It places entire body into a state of unconsciousness (sleep) during which the patient has no awareness and feels nothing, and will remember nothing of the surgical experience.

General anesthesia is administered by injection or through a breathing mask, or sometimes both. In order to control your breathing, patients are intubated, which is the insertion of a flexible tube down the windpipe. The tube is inserted after the anesthesia is given and removed as you are waking up and breathing adequately. Upon awakening from anesthesia, patients may experience disorientation and/or a mild sore throat from the intubation.

- Laryngeal Mask Airway (LMA) – When possible, the anesthesiologist will use a Laryngeal Mask Airway device instead of intubation because it is quicker and causes less discomfort for the patient. An LMA is a tube with an inflatable cuff that is inserted into the pharynx (the upper part of the windpipe).

For general anesthesia patient may be administered

-pre-medication: glycopyrrolate, rantac, emeset, pantop

-induction: fentanyl, propofol, thio, ketamine

-muscle relaxant: vecuronium, atracurium, rocuronium, scoline

-reversal: glycopyrrolate+neostigmine other medications like inotropes and vasodilators may be administered.

4. MAC (Monitored Anesthesia Care):

Monitored Anesthesia Care (MAC) is the intravenous administration of mild sedatives to help a patient relax and relieve anxiety during minor procedures that do not require general anesthesia. These procedures, such as biopsies and colonoscopies, typically require the injection of a local anesthetic to numb the surgical site.

Based on the type of surgery and patient condition that is co-morbidities anesthesia is selected.

PRE ANESTHETIC CHECKUP(PAC):

It is medical checkup by the anesthesiologist to formulate effective anesthetic plan.

The guidelines of the American Society of Anesthesiologists (ASA) indicate that a preanesthesia visit should definitely include the following:

An interview with the patient or guardian to review medical, anesthesia, and medication history. An appropriate physical examination

Review of diagnostic data (laboratory, electrocardiogram, radiographs, consultations) Assignment of ASA physical status score (ASA-PS)

The only solution to effective pre-anesthetic checkup is the use of good mnemonic that covers all aspects of pre-anesthetic assessment completely. The mnemonic is A2, B2, C2, D2, E2, F2, and G2. This mnemonic is unique because it follows an order based on the degree of significance of components of pre-anesthetic assessment.

A - Affirmative history: The history of present surgical condition with the details of progression to present state. Details of past illness and treatment should be elicited.

A - Airway: Perform detailed airway examination and have a plan for airway management. Always have plan B in case plan A fails.

B - Blood hemoglobin, blood loss estimation, and blood availability: Check for hemoglobin level and take measures to improve the same. Assess the requirement of blood based on expected blood loss and preoperative hemoglobin. Ensure availability of blood.

B - Breathing: Look for respiratory rate, pattern, and dyspnea.

C - Clinical examination: Assess pulse volume, rhythm, and blood pressure. Do detailed systemic examination. Assess effort tolerance.

C - Co-morbidities: Look for co-morbid diseases like diabetes, hypertension, asthma, and epilepsy and optimize the end organ problems.

D - Drugs being used by the patient: Elicit the details of current drug therapy and allergies to plan anesthesia.

D - Details of previous anesthesia and surgeries: Elicit the details of previous anesthesia and surgeries to anticipate anesthetic difficulty.

E - Evaluate investigations: Look for appropriate investigations that would guide anesthetic management.

E - End point to take up the case for surgery: End point to take up the case for surgery should be decided to avoid unnecessary postponement if further optimization is not possible.

F - Fluid status: Follow fasting guidelines appropriate to the age and surgery.

F - Fasting: Advice adequate duration of fasting for that particular age to prevent aspiration.

G - Give physical status: Assign a physical status classification.

G - Get consent: Discuss the surgical problems and the anesthetic risk with the patient and relatives to obtain appropriate consent.

PREOPERATIVE FASTING:

Pre operative fasting is to minimise the volume of stomach contents and its acidity. Regurgitation of stomach contents and its subsequent aspiration is an inherent risk during general anaesthesia, regional anaesthesia and sedation, and by planned fasting of patients this risk can be reduced.

LOCAL ANESTHESIA:

No preoperative fasting required for local anesthesia.

GENERAL ANESTHESIA:

If a surgery is planned under general anaesthesia the patient is fasted for at least 4 hours for liquids and 6hrs for solid foods as this is the time required for stomach to empty itself of its contents as empty stomach is needed because during general anaesthesia sphincter at lower end of esophagus(food pipe) relaxes,cough reflex diminishes and if stomach is full it's contents can regurgitate up through the esophagus then pharynx and trachea(wind pipe) into lungs.This leads to inflammation of lungs for which the medical term is "aspiration pneumonitis" and it is a life threatening condition with very high mortality rate(death rate following this condition).so a simple step prevents a potentially life threatening consequence.. and ,in case of emergency operations the anesthetist first puts a tube through the nose down the esophagus into patient's stomach to aspirate(remove) its contents before proceeding further.

Solids and milk-containing drinks should not be consumed within 6 hours of the start of an operating list (milk curdles in the stomach and becomes a solid).

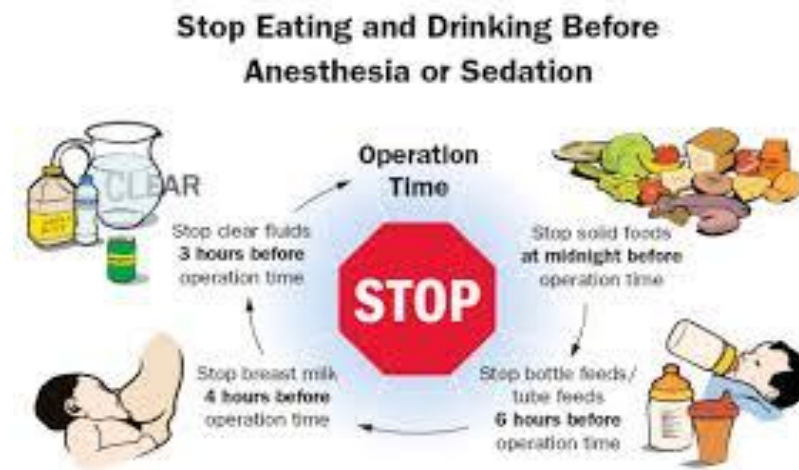
Patients should avoid large or fatty meals the day before surgery as fat and fibre remains in the stomach for longer than other foods.

Prescribed medication and premedication.-Prescribed medicines and premedication can be taken with a small quantity of water up to 30 minutes before anaesthesia (water encourages stomach emptying and can be given up to 30 minutes pre-op).

Where there is an increased risk of gastro-oesophageal reflux steps should be taken to increase the gastric pH by prescribing antacids, H2 antagonists or proton pump inhibitors.

PATIENTS REQUIRING REGIONAL ANAESTHESIA ONLY

These patients should be fasted as for general anaesthesia as they may require sedation or a general anaesthetic. Examples of regional anaesthesia: spinal, epidural, peribulbar block.

**CHILDREN REQUIRING ANAESTHESIA OR INTRAVENOUS SEDATION:**

Where possible children should be anaesthetised on dedicated paediatric lists.

Fasting information for babies and children

No solids, formula milk or cow's milk for 6 hours prior to anaesthesia.

No breast milk for 4 hours prior to anaesthesia.

Clear fluids (still water or dilute squash) may be given up to 2 hours before anaesthesia.

Excessive fasting should be avoided in patients as it may cause dehydration, electrolyte abnormalities, hypoglycaemia (particularly in children), insulin resistance, headaches, confusion, irritability, anxiety and nausea and vomiting. Prolonged and excessive fasting is therefore to be avoided. Image 2.

ASA Fasting guidelines

Ingested material	Minimum fast
• Clear liquids	2 h
• Breast milk	4 h
• Infant formula milk	4-6 h
• Non human milk	6 h
• Light meal	6 h
• Heavy meal (contain fat &meat)	8 h

ANESTHESIA ADMINISTRATION:

Anesthesia is given as shot or inhaled or given intravenously based on the type of surgery.

MOA: Different anesthetics have different end points. For instance, propofol (injection) might be used to start the anesthetic, fentanyl (injection) used to blunt the stress response, midazolam (injection) given to ensure amnesia and sevoflurane (inhaled) during the procedure to maintain the effects. More recently, several intravenous drugs have been developed which, if desired, allow inhaled general anesthetics to be avoided completely.

UNINTENDED INTRAOPERATIVE AWARENESS:

Muscles relaxants are usually given along side anesthesia, because of which patient is unable to signal to their surgeon or anesthetist that they are still aware of what is happening.

Patient that experience unintended intra-operative awareness can suffer long term psychological problems. Most often awareness is short lined and occurs prior to the procedure.

According to recent large scale investigation, patient experienced tugging, stitching, pain, paralysis and choking, and other sensations.

POTENTIAL RISK FACTORS:

cardiac or lung related problems
daily alcohol consumption
emergency surgery
cesarean section
anesthesiologist error
use of additional medicines

POST ANESTHETIC CARE:

In post anesthesia care unit patients heart rate (min), blood pressure(mm of Hg), oxygen saturation(spo2 %), respiratory rate(min), temperature(F) and pain score is monitored for every 15 to 20 minutes.

KEY WORDS:

regional anesthesia, monitored anesthesia care, general anesthesia,local anesthesia, intra operative awareness, fasting

CONCLUSION

Realizing the importance of anesthesia, and to reduce the risk associated with is important. With the complete understanding of pre-anesthetic checkup helps the patients to provide complete & correct information which helps the anesthesiologist to formulate effective anesthetic plan. Understanding of preoperative fasting the risk of aspiration pneumonia which is a life threatening condition can be minimized and excessive fasting which leads to dehydration, electrolyte abnormalities, hypoglycaemia (particularly in children), insulin resistance, headaches, confusion, irritability, anxiety and nausea and vomiting can be reduced. With complete understanding Health care professionals can cooperate with patients & the anesthesiologist to formulate effective anesthetic plan for better therapeutic outcome.

ABBREVIATION USED:

ASA -American Society of Anesthesiologists,
MAC -Monitored Anesthesia Care,
LMA -Laryngeal Mask Airway,
LA -local anesthesia,
GA -general anesthesia,
SA -spinal anesthesia.

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COMPETING INTEREST

The author declare that they have no competing interest & recommends future research.

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