The Role of Short-acting Drugs in Modern Anesthesia

Short-acting medications are usually desirable in modern clinical anesthesia practice. They allow rapid recovery at the end of surgery, proper assessment the level of consciousness, minimal residual effects, preserving the cognition dysfunction and patients satisfaction.

For a balanced anesthesia technique, combinations of intravenous anesthetics, inhalational anesthetics, benzodiazepines, opioids, a muscle relaxant and adjuncts are usually used.

The available short acting medications include Propofol, Remifentanil and Dexmetomidine and the inhalation anesthetics.

Propofol

It is chemically described as 2,6- diisopropylphenol, insoluble in water, it is formulated in a white, oil-in-water emulsion. Its anesthetic properties were first reported in January 1973, introduced to clinical practice in Europe in 1983 and in the United States in 1984.

Similar to other intravenous anesthetic agents like benzodiazepines and barbiturates, Propofol exerts its hypnotic actions by activation of the central inhibitory neurotransmitter - gamma-aminobutyric acid (GABA). Propofol is used for induction and maintenance of anesthesia, procedural sedation and for short term sedation in intensive care units. Because of its short action, it is used by infusion and Target Control Infusion (TCI) using a special infusion pump.

Remifentanil:

Remifentanil is an opioid agonist, the chemical name is 3-[4- methoxycarbonyl-4-[(1-oxopropyl) phenylamino]-1-piperidine]propanoic acid methyl ester, hydrochloride salt. Remifentanil is administered at an infusion rate of 0.5 to 1 mcg/kg/min with a hypnotic or volatile agent for the induction of anesthesia. It is used in almost all types of surgeries and for sedation in critical care units. Due to the rapid offset of action, no residual analgesic activity will be present within 5 to 10 minutes after discontinuation. For patients undergoing surgical procedures where post-operative pain is generally anticipated, alternative analgesics should be administered prior to discontinuation of Remifentail.

Dexmedetomidine:

Dexmedetomidine is a highly selective α2-adrenergic receptor agonist that is associated with sedative and analgesic sparing effects, reduced delirium and agitation, perioperative sympatholysis, cardiovascular stabilizing effects, and preservation of respiratory function. The recommended dose range of 0.2 to 0.7 μg/ kg/ hr administered as intravenous infusion up to 24 hours. Because of its unique properties offers its promising use in wide spectrum of clinical settings and ICUs. It is a part of fast-tracking anesthesia regimens and offers anesthetic sparing and hemodynamic stabilizing effects.