Lidocaine

Lidocaine (Xylocaine) is a sodium channel blocker that inhibits neuronal impulses. This medication is indicated to treat ventricular dysrhythmias and induce local anesthesia. Side effects include drowsiness, confusion, paresthesia, seizures, and respiratory arrest. Lidocaine is an amide-type anesthetic and is metabolized by the liver. Administering lidocaine with a vasoconstrictor prolongs the duration of local anesthetic effects.



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Mechanism

Blocks Na+ Channels
Block-guy blocking Salt-shaker Channel
Lidocaine stops neuronal conduction by blocking sodium channels. This action prevents sodium ions from entering the channel and inhibits action potential. By blocking sodium channels in neurons of the skin, this drug prevents action potentials from creating pain perception. Lidocaine also blocks sodium channels in the heart and suppresses neuronal excitability present in ventricular dysrhythmias. It is a Class IB antiarrhythmic.

Indications

Ventricular Arrhythmia
Vent-heart with Broken-Arrhythmia-drum
Lidocaine blocks sodium channels and slows nerve conduction in the heart. This drug also slows the heart's depolarization activity and accelerates repolarization duration. Unlike other antidysrhythmic medications, lidocaine does not cause anticholinergic effects.

Anesthetic
A-Nest of Anesthetics
As a nonselective amide local anesthetic, lidocaine blocks conduction to both sensory and motor neurons. The degree of blockage depends on the medication's volume and concentration. This medication blocks impulses in the following order: autonomic, somatic sensory, and lastly, somatic motor. This drug can be administered either topically or by injection.

Side Effects

Paresthesias
Paris-t-shirt with Pins-and-needles
Excessive doses of lidocaine may cause paresthesias, a numbing sensation associated with nerve endings.

Seizures
Caesar
Excessive amounts of lidocaine causes CNS excitation and may lead to seizures. Administering a benzodiazepine may be used to manage convulsions.

Respiratory Depression
Deflated Lungs
High IV doses of lidocaine may severely depress the CNS and result in respiration depression. Absorption of lidocaine in the general circulation causes systemic toxicity and may cause respiratory depression. Ensure resuscitation equipment is available nearby.

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Drowsiness

Sleepy-guy

The CNS excitation phase induced by lidocaine is followed by depressive symptoms such as drowsiness and confusion. In addition, this medication may be absorbed in the general circulation and cause systemic toxicity. Symptoms include CNS depression. It is important to monitor the patient's vital signs and level of consciousness.

Consideration

Anesthetic Effects Extended with Epinephrine

A-nest of Anesthetic Extended with Epi-pen

Administering a vasoconstrictor (i.e., epinephrine) with lidocaine extends the duration of the local anesthetic. By decreasing local blood flow and delaying systemic absorption of the anesthetic, epinephrine prolongs anesthesia and decreases the risk of toxicity. Delaying systemic absorption of lidocaine allows a lower dosage to obtain the desired effect.

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