Nondepolarizing Neuromuscular Blocking Drugs

Nondepolarizing neuromuscular blocking drugs are a class of medication which can be used for muscle paralysis during mechanical ventilation or surgery. They are typically used for long-term motor paralysis, which may occur within five minutes, and most agents are later excreted or metabolized by the liver. These drugs are competitive antagonists with acetylcholine at the post-junctional membrane nicotinic receptors of the neuromuscular junction, leaving fewer binding sites for acetylcholine to bind. These paralytic agents are reversible, and reversal of the neuromuscular blockade can be achieved by using cholinesterase inhibitors. These cholinesterase inhibitors also may be used in the diagnosis and treatment of myasthenia gravis.



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Names Include "Cur"

Nun Cur-ing Muscle Contraction

Nondepolarizing neuromuscular blocking drugs can be identified by the “cur” within their names. These drugs include atracurium, mivacurium, pancuronium, rocuronium, tubocurarine, and vecuronium.

Competitive Antagonists

Competitive-race Ant-toga

These drugs are competitive antagonists with acetylcholine at the post-junctional membrane nicotinic receptors of the neuromuscular junction. This leaves fewer binding sites for acetylcholine to have neurotransmitter activity.

Acetylcholine Competition

A-seagull-cola Competing

These drugs compete with acetylcholine for post-synaptic binding sites, serving as competitive antagonists.

Reversal of Blockade

Reversing through Blocks

These drugs are paralytic agents which are reversible. Cholinesterase inhibitors can be used for reversal of a nondepolarizing drug blockade. These medications prevent the enzyme acetylcholinesterase from breaking down acetylcholine, thereby increasing acetylcholine levels in the neuromuscular junction and reversing the effect of the anesthetic.

Neostigmine, Edrophonium

Neon-stick-man and Edward-phone-thumb

Cholinesterase inhibitors such as neostigmine and edrophonium may be used for reversal of a nondepolarizing drug blockade. These cholinesterase inhibitors can be used in myasthenia gravis as well, with edrophonium as a diagnostic agent and neostigmine for regular treatment.

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