

Antibiotics and muscle relaxation

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Anesthesiologists use quite a few medications during anesthesia of a patient. Those include inhaled anesthetics, intravenous anesthetics, opioids, muscle relaxants, cholinesterase inhibitors, anticholinergic drugs, adrenergic agonists and antagonists, hypotensive agents, local anesthetics, and several adjunct drugs. We are usually well-trained in the administration of these drugs and aware of their actions and side effects. How about antibiotics? The anesthesiologists do not seem to have as much interest in antibiotics as their own favorite drugs.

Antimicrobial agents can be used for prophylaxis to reduce the incidence of postoperative infections or for treatment of obvious preexisting infection. It is frequently requested to the anesthetic part to administer the prescribed antibiotics perioperatively. Many institutions have much debate as to the actual administration of the antibiotics, as well as the responsibility for their actions and side effects between anesthesiologists and surgeons. The truth is, each institution has its own protocol for antibiotic administration for the prophylaxis of surgical site infections and updates the protocol occasionally according to the rapid change of the drugs and information. There are potential difficulties that anesthesiologists be made aware of in association with the use of antibiotics, such as allergic reactions, end-organ damage and prolongation of neuromuscular block [1].

Most antibiotics can cause neuromuscular blockade alone and also potentiate blockade when combined with neuromuscular blockers. These can happen by the two different mechanisms, including inhibition of the prejunctional acetylcholine release and depression of postjunctional nicotinic acetylcholine receptor sensitivity to acetylcholine.

Because gentamicin covers gram-negative organisms, and clindamycin covers gram-positive and anaerobic organisms, the combination therapy of those is a common treatment for postpartum endometritis. There are few reports about the effect of gentamicin and clindamycin on neuromuscular blockade caused by rocuronium. In this edition of the Journal, Lee et al. [2] studied about the effect of gentamicin and clindamycin on rocuronium-induced neuromuscular blockade in rat phrenic nerve-hemidiaphragm preparations. So far, the authors have succeeded in finding out the effect of a variety of drugs on neuromuscular blockade in a series of in vitro studies. They have presented us with beautiful sigmoid curves to show a relationship between drug concentration and response on the single twitch and tetanic fade in their articles. Their consecutive findings are as follows: 1. Clindamycin and gentamicin interfere with neuromuscular transmission. Neostigmine and calcium antagonize the neuromuscular blockade caused by gentamicin, but augment that caused by clindamycin [3]. 2. Neostigmine partially antagonizes the neuromuscular blockade that is induced by a combination of clindamycin and rocuronium [4]. 3. Bupivacaine inhibits neuromuscular conduction and enhances rocuronium-induced neuromuscular blockade [5]. 4. Gentamicin or a combination of gentamicin and clindamycin enhances rocuronium-induced neuromuscular blockade [2]. All the above laboratory results can be applied clinically in the operating room and intensive care unit.

Since anesthesiologists will perhaps not be able to avoid a responsibility in administration of antibiotic regimen as time goes on, we should have the latest knowledge concerning antibiotics, including the interaction with the muscle relaxants.

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