Atropine increases the positive adrenergic effects of norepinephrine.  
A Pilot study.

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Background and Goal of Study:

Atropine is a competitive antagonist of cholinergic receptors and is widely used to blunt the increased vagal tone that is often caused by surgical manipulations. In clinical anaesthesia practice, it is almost exclusively used to treat bradycardia.

Norepinephrine (NOR) is a catecholamine used to increase the arterial pressure in several medical conditions. Its effect is based on the positive inotropic and chronotropic effects via cardiac β1 receptors and at higher doses on vasoconstriction via vascular α receptors.

There are currently no studies revealing the pharmacological interaction of these drugs in patients under total intravenous anaesthesia.

Since the favorable effect of NOR on tissue perfusion swiftly disappears at higher dose, the aim of the study is to describe the effects of atropine on heart rate (HR), mean arterial pressure (MAP), and cardiac output (CO) of atropine in combination with or without low-dose NOR.

Material and methods:

After local IRB approval and written IC, 23 patients scheduled for ophthalmic surgery under general anaesthesia were included. If the MAP decreased below 80% of baseline value, NOR 0.05 µg/kg/min was started. If the HR dropped 60 bpm, atropine 0.5 mg was administered (all patients). HR, MAP and CO were recorded (Nexfin, BMEye, Amsterdam, NL). All recordings were synchronized on the moment of atropine administration and analyzed in two groups: with (NOR+) or without (NOR-) norepinephrine.

Results and discussion:

Changes in HR, MAP and CO were more prominent in the NOR+ group (14/23 patients) than in the NOR- group. The mean (SD) HR increased 32(18) vs 19(11) bpm. The MAP increased 24(11) vs 5(8) mmHg. The CO increased 3(1.9) versus 0.7(0.8) L min⁻¹. All differences were significant (p< 0.05).

Conclusion:

The haemodynamic effect of atropine is more distinct in the presence of NOR. This study reveals that in patients receiving low-dose NOR, an advantageous haemodynamic effect can be achieved with the administration of 0.5 mg atropine.