Cardiovascular effects of fentanyl and propofol on hemodynamic function in rabbits.

OBJECTIVE: To evaluate short-term cardiovascular effects after IV administration of boluses of fentanyl in rabbits. ANIMALS: 6 healthy New Zealand White rabbits. PROCEDURES: Each rabbit was anesthetized with propofol (4.0 to 8.0 mg/kg, IV); anesthesia was maintained by administration of propofol (1.2 to 1.3 mg/kg/min, IV). Subsequently, 3 injections of fentanyl (0.0053 mg/kg) were administered. Before and for 10 minutes after injections, the following variables were measured: vessel diameter, peak systolic blood flow velocity, minimum diastolic blood flow velocity, end-diastolic blood flow velocity, time-average blood flow velocity, mean volumetric flow (VFmean), resistance index (RI), and pulsatility index for the left common carotid artery after the first injection and abdominal aorta after the third injection; mean arterial pressure (MAP); heart rate (HR); arterial oxygen saturation; end-tidal partial pressure of carbon dioxide; and body temperature. Echocardiography was performed after the second injection. RESULTS: Fentanyl injections caused a transient and significant decrease in diameter and VFmean of the abdominal aorta and end-diastolic blood flow velocity of the left common carotid artery and an increase in peak systolic blood flow velocity and RI of the left common carotid artery. Also, MAP, HR, and body temperature decreased significantly after injections.
CONCLUSIONS AND CLINICAL RELEVANCE: Fentanyl injections induced a short-term decrease of vessel diameter in the abdominal aorta and increased resistance in the distal distribution area of the left common carotid artery. Results revealed decreases in MAP, HR, and body temperature, with an increasing effect after the third bolus injection, which indicated a cumulative drug effect.