Supplementary Information

Supplementary Table 1. Key clinical research elements in intraoperative blood pressure pharmacologic regulation strategies

Intervention drug	Administration strategy	Patient population/ type of surgery	Target blood pressure management scenario	Secondary outcomes	Primary outcomes	Reference
Vasopressors such as metaraminol	High intraoperative dosage	Elderly patients undergoing non-cardiac surgery	Mean arterial pressure (MAP) <60, systolic blood pressure (SBP) <90	Decrease in hemoglobin levels	Postoperative AKI	[1]
Esketamine	Continuous infusion at 0.25 mg/kg/h	Patients undergoing below-knee orthopedic surgery	Blood pressure regulation during tourniquet inflation	Intraoperative hypotension and postoperative adverse reactions	Incidence of tourniquet-induced hypertension	[2]
Magnesium sulfate	Intraoperative intravenous infusion	Postoperative patients undergoing abdominoplasty after weight loss	Management of systolic blood pressure during tracheal intubation and skin incision	Ephedrine and propofol consumption and pain scores	Changes in systolic blood pressure during tracheal intubation and skin incision	[3]
Propofol versus sevoflurane	Intravenous infusion versus inhalation	Patients undergoing abdominal laparoscopic surgery	Maintenance of MAP with phenylephrine	Postoperative pain and opioid consumption	Changes in nociception level (NOL) index after tetanic stimulation	[4]
Sufentanil combined with propofol	Total intravenous anesthesia with combined administration	Patients undergoing radical mastectomy	Stable intraoperative blood pressure and heart rate (HR)	Stress indicators, pain scores, and adverse reactions	Hemodynamic parameters remain stable	[5]
Ketamine, dexmedetomidine	Intravenous bolus followed by continuous infusion	American society of anesthesiologists physical status (ASA) I/II patients undergoing laparoscopic cholecystectomy	Maintains intraoperative hemodynamic stability	Comparable recovery quality and side effects	Reduced anesthetic and analgesic consumption	[6]
Dexmedetomidine	(1 μg/kg) as an adjuvant to ropivacaine	Pediatric upper limb fracture surgery	Comparison of intraoperative blood pressure and HR	Rescue analgesia and complications	Prolonged duration of analgesia maintenance	[7]
Dexmedetomidine	Intravenous administration before anesthesia induction	Patients undergoing laparoscopic cholecystectomy	Maintains hemodynamic stability	Reduces incidence of coughing	Hemodynamic stability	[8]
Phenoxybenzamine (PXB)	Duration of preoperative PXB administration	Patients undergoing pheochromocytoma and paraganglioma (PPGL) resection	Intraoperative hemodynamic targets	Hypotension, infection	Hemodynamic instability	[9]
Dexmedetomidine	Continuous infusion at 0.5-1.0 μg/kg/hour	Laparoscopic colorectal cancer surgery	Intraoperative blood pressure measurement at multiple time points	MAP, HR, and bispectral index (BIS)	Reduced postoperative pain scores	[10]
Dexmedetomidine	Intravenous injection of 0.5 μg/kg before anesthesia induction	ASA I/II grade patients undergoing laparoscopic cholecystectomy (LC)	Perioperative blood pressure management during general anesthesia for LC	Anesthetic consumption, recovery time, and adverse events	Hemodynamic stability and attenuation of stress response	[11]
Ketamine, magnesium sulfate	Adjuvant for scalp block	Patients undergoing supratentorial craniotomy	Blood pressure control during pin insertion	Changes in MAP and HR	Reduction in postoperative pain scores	[12]
Hyoscine butyl bromide	Prophylactic intravenous injection of 20 mg	Spinal anesthesia for cesarean section in parturients	Prevention of intraoperative bradycardia	Reduction in the incidence of nausea and vomiting	Decrease in the incidence of bradycardia	[13]

Esmolol	Single dose of 0.5-1.0 mg/kg before induction, continuous infusion of 0.5-2.0 mg/kg/h during surgery	ASA II/III surgical patients	Perioperative intubation and extubation responses	Intraoperative and postoperative opioid consumption and adverse events	Incidence of intubation and extubation responses	[14]
Salbutamol/budesonide	Intraoperative inhalation administration	Elderly patients with high cardiovascular risk undergoing thoracoscopic lobectomy	Intraoperative blood pressure maintained within 20% of baseline	Reduced postoperative pulmonary complication score	Decreased incidence of myocardial injury after non-cardiac surgery (MINS)	[15]

Note: AKI, acute kidney injury; ASA, American society of anesthesiologists physical status; BIS, bispectral index; HR, heart rate; LC, laparoscopic cholecystectomy; MAP, mean arterial pressure; MINS, myocardial injury after non-cardiac surgery; NOL, nociception level; PPGL, pheochromocytoma and paraganglioma; PXB, phenoxybenzamine; SBP, systolic blood pressure.

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