

Intraoperative Hypotension: Key Points in Prevention and Treatment

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Abstract

Hypotension, like other blood pressure disorders, might compromise intraoperative patient stability, necessitating prompt diagnosis and treatment. Intraoperative hypotension (defined as a systolic blood pressure [BP] of less than 90 mmHg) is linked to a higher risk of death and/or myocardial infarction, and the longer the hypotension lasts, the greater the risk.

Key Words: hypotension; blood pressure disorders; chronic baroreceptor desensitization

Introduction

Hypotension, like other blood pressure disorders, might compromise intraoperative patient stability, necessitating prompt diagnosis and treatment.

Intraoperative hypotension (defined as a systolic blood pressure [BP] of less than 90 mmHg) is linked to a higher risk of death and/or myocardial infarction, and the longer the hypotension lasts, the greater the risk [1].

Chronic baroreceptor desensitization, vascular elasticity loss, or intravascular volume depletion owing to diuretic medication affect patients with preexisting hypertension. They may have increased reactions to sympathetic inhibition produced by general anesthetics, neuraxial blockade, fluid shifts or blood loss during surgery, or the use of any antihypertensive medication [2].

Initial treatment

Intravenous (IV) isotonic crystalloid solution delivered in 250- to 500-mL increments is usually the first line of therapy for a hypotensive episode. To raise blood pressure, an IV vasopressor/inotropic drug is given if necessary. To minimize overtreatment and subsequent hypertension, lower dosages of short-acting medicines are usually used (eg, phenylephrine 40- to 100-mcg increments or ephedrine 5- to 10-mg increments). Infusion of a vasopressor/inotropic drug may be required for severe or resistant hypotension [3].

Causes and management of intraoperative hypotension

Hypovolemia

Preoperative hypovolemia has been linked to a higher risk of severe decreases in blood pressure during anesthetic induction [4]. Hypovolemia causes poor cardiac output and decreased tissue perfusion, which can

progress to shock and multiorgan failure if left untreated (5, 6). In patients having major invasive surgery, dynamic hemodynamic parameters are utilized to guide goal-directed fluid therapy, particularly in high-risk patients with considerable predicted blood losses and fluid changes [7].

Induction of general anesthesia

Patients with chronic hypertension may have severe hypotension after sympathetic reactions during laryngoscopy and endotracheal intubation that ordinarily increase BP have stopped, especially if antihypertensive or supplementary anesthetic drugs were used to suppress these sympathetic responses [8, 9].

Sympathectomy due to neuraxial block

Sympathectomy during high neuraxial anesthetic block can cause hypotension, especially if the sensory block is above the T6 level, and hypotension for this reason is more prevalent in patients who already have high blood pressure [10].

Inhibition of the renin angiotensin system

The renin angiotensin system (RAS) is reliant on the direct actions of anesthetic drugs, suppression of the sympathetic nervous system, and loss of baroreceptor reflex regulation of arterial pressure during general anesthesia. As a result, patients who take angiotensin-converting enzyme (ACE) inhibitors or angiotensin II receptor blockers (ARBs) prior to surgery have a higher risk of intraoperative hypotension [11, 12].

Other causes

Less common causes of severe intraoperative hypotension in patients with chronic hypertension include pulmonary embolism, anaphylaxis, sepsis, myocardial infarction, or acute heart failure, just as they do in normotensive patients [13, 14].

Conclusion

Hypotension, like hypertension, is a serious disease that need extra care throughout the perioperative and postoperative periods. Early identification and treatment can have a substantial impact on survival and postoperative outcomes.

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