Hypotensive anaesthesia, new trends

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of
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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

﴿ رَبِّ قَدْ آتَيْتَنِي مِنَ الْمُلْكِ وَعَلَّمْتَنِي مِن تَأْوِيلِ الأَحَادِيثِ
فَاطِرَ السَّمَاوَاتِ وَالأَرْضِ أَنتَ وَلِيِّي فِي الدُّنْيَا وَالآخِرَةِ
تَوَفَّنِي مُسْلِمًا وَأَلْحِقْنِي بِالصَّالِحِينَ ﴾

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LIST OF ABBREVIATIONS

DH: Deliberate hypotension.

MAP: Mean arterial blood pressure.

V/Q: Ventilation perfusion mismatch.

ICP: Intracranial pressure.

CBF: Cerebral blood flow.

CVS: Cardiovascular system.

CNS: Central nervous system.

GFR: Glomerular filtration rate.

RBF: Renal blood flow.

CO: Cardiac output.

PEEP: Positive end expiratory pressure.

VMC: Vasomotor center.

ATP: Adenosine triphosphate.

GTN: Glyceryl trinitrate.

EEG: Electroencephalogram.

SVR: Systemic vascular resistance.

MAC: Minimum alveolar concentration.

$ETCO_2$: End tidal carbon dioxide.

CPP: Cerebral perfusion pressure.

SNP: Sodium nitroprusside.

CVP: Central Venous pressure.

PRA: Plasma renin activity.

Dinamap: Device for indirect non-invasive automated measurement of arterial blood pressure.

$Paco_2$: Carbon dioxide tension.

ABSTRACT

Hypotensive anaesthesia represents a great challenge to the anaesthetist. Hypotensive anaesthesia is effective in decreasing blood loss and provides better visibility in surgical field.agood hypotensive anaesthesia is don to make the possible more easy, but not to make the impossible possible. There are corner stones to achieve a safe level of hypotension which maintain adequate perfusion to main vital organs. These corner stones includes: clinical considerations, techniques, monitoring, reversal of hypotension and problems & complications. The precise incidence of complications with hypotensive anaesthesia is difficult to determine so the decision to use hypotensive anaesthesia should not be made in the operating room without careful consideration of the potential complications.

Key words:

Hypotensive anaesthesia – Clinical consideration – Techniques – Problems & complications.

INTRODUCTION

Introduction

Most studies define Hypotensive anathesia as reduction in systolic blood pressure to 80 to 90 mmHg. According to another definition, hypotensive anathesia is a decrease in MAP to 50 to 60 mmHg in normotensive patients[(1)] and (20-30%) from preoperative mean arterial blood pressure in chronic hypertensive patients during anathesia[(2)].

The main purpose of inducing hypotension during anathesia is to decrease blood loss, thereby improving operating conditions or decreasing the need to blood transfusion[(3)].

The possible benefit to the surgeon is improved visibility of operative field during delicate procedures and major orthopedic procedures e.g. total hip arthroplasty, head and neck surgery, procedures on the cranium, middle ear and radical cancer operations [(3)].

When considering the many facts of Hypotensive anathesia the concern of the anesthesiologist should be directed towards not only

selection of the most appropriate hypotensive drug but also the type of surgery, length of the procedure, need to decrease blood loss, and patient suitability [3].

Several techniques are available to induce hypotensive anathesia. Physiological techniques like positioning and ventilation. Pharmacological techniques are including volatile anesthetics, direct acting vasodilator drugs, autonomic ganglion blocking drugs, alpha adrenergic blocking drugs, combined α and beta adrenergic receptor blocking drugs, calcium channel blocking drugs, prostaglandin E1. regional techniques like spinal & epidural anaesthesia. Hypotensive anathesia decreases arterial blood pressure by decreasing cardiac output, systemic vascular resistance or both [4].

The effects of hypotension on various organ beds are complex, depending on the drugs used and the magnitude and length of hypotension [3].

Beat to beat measurement of arterial blood pressure, electrocardiography monitoring is

mandatory for patients undergoing clinically significant deliberate decrease in arterial blood pressure. Routinely temperature and pulse oximetry are essential [3].

The contraindications to hypotensive anathesia have relaxed over the years because of better drugs, monitoring, and more experience with the techniques, However, several contraindications must be considered, cerebrovascular disease, liver dysfunction, renal dysfunction, or severe peripheral claudication suggest that the patient is less likely to have organ perfusion., Patients with severe anemia and hypovolaemia are not suitable candidates [(4)].

The precise incidence of complications with hypotensive anathesia is difficult to determine but it is usually related to the nervous system, anuria and oliguria, postoperative bleeding to the operative side[(5)].

The decision to induce hypotension during anathesia should not be made in the operating room without careful consideration of the potential complications[(5)].

AIM OF WORK

Aim of work

Hypotensive anathesia presents a great challenge to the anesthesiologist. So the aim of this study is to discuss the following items:

* **Clinical Considerations which includes :**
  - **Indications.**
  - **Contraindications.**
  - **Effect on organ function.**
* **Techniques for hypotensive anathesia which includes:**
  - **Physiological factors.**
  - **Pharmacological methods**
  - **Regional anaesthesia.**
* **Monitoring.**
* **Reversal of hypotensive anathesia.**
* **Problems, complications and postoperative care.**


CHAPTER 1