

Assessment on Perioperative Outcome of Epidural Anesthesia & Analgesia

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Abstract

Introduction: Epidural anesthesia and analgesia have the potential to reduce or eliminate the perioperative physiologic stress responses to surgery and thereby decrease surgical complications and improve outcomes. This study aimed to integrate experimental and clinical data addressing the physiologic effects of epidural anesthesia and postoperative epidural analgesia on surgical patients and to review the real and potential benefits of this technology concerning patient outcomes. **Methods:** This prospective observational study was conducted at the Department of Anesthesia, Upazilla Health Complex, Daganbhuiya, Feni, Bangladesh. The study was carried out from June 2020 to July 2021. A total of 110 patients were selected as study subjects as per inclusion criteria. **Result:** Out of 110 study subjects 20 (18.19%) subjects were in the 25-30 years age group, 30 (27.27%) were in the 31-35 years age group and the rest 60 (54.54%) were in >35 years, age group. Regarding the region of surgery done, 50% of subjects underwent lower abdominal surgery, 20% underwent surgery of lower extremities, 15% underwent labor pain, and the rest 15% underwent cardiothoracic surgery. Concerning intraoperative complication, hypotension was predominant which constituted 9% of total study subjects followed by nausea & vomiting seen in 3% of patients. 2.5% of patients had bradycardia, 2% experienced hypertension, only 1% of patients had tachycardia, and none experienced poor anesthesia. In terms of postoperative complications, post-dural puncture headache was predominant which was seen in 4% of patients, 2% had prolonged ICU stay, 2% had cardiopulmonary complications, 1% had postoperative pain, and 1% experienced occlusion of catheter and catheter fragment retention. It was seen that 95.5% of total patients did not need ephedrine or atropine, only 2% of patients needed ephedrine during the operation due to hypotension and 2.5% needed atropine during the operation due to bradycardia. Regarding the advantages of epidural anesthesia, reduced ileus was seen in 105 (95.45%) patients, reduced length of hospital stay in 108 (98.18%) patients, and reduced 30-day morbidity and mortality in 110 (100%) patients. The overall surgical outcome was excellent as well. In 98% of cases, the surgical outcome was satisfactory and only 2% showed poor surgical outcome. **Conclusion:** The effect of anesthetic and postoperative analgesic techniques on perioperative outcomes varies with the type of operation performed. Overall, epidural analgesia provides better postoperative pain relief and surgical outcomes.

Keywords: Analgesia, Anesthesia, Epidural, Perioperative.

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INTRODUCTION

An epidural block is widely used to manage major abdominal surgery and postoperative analgesia [1]. Many beneficial aspects of epidural anesthesia have been reported, including better suppression of surgical stress, positive effect on postoperative nitrogen balance, more stable cardiovascular hemodynamics, reduced blood loss, better peripheral vascular circulation, and better postoperative pain control [2]. Intrathecal and epidural techniques produce reliable analgesia in patients undergoing cardiac surgery. Additional

potential benefits include stress response attenuation and thoracic cardiac sympathectomy. The quality of analgesia obtained with thoracic epidural anesthetic techniques is sufficient to allow cardiac surgery to be performed in awake patients without general endotracheal anesthesia [3]. Several local anesthetic drugs are used to produce epidural anesthesia, such as lidocaine, bupivacaine, ropivacaine, and mepivacaine. Epidural analgesia is obtained with opioid agonists, alpha₂ adrenergic agonists, and ketamine. A combination of a local anesthetic drug with an alpha₂ adrenergic agonist or an opioid is the most popular

option as this combination extends the period of action of the epidural anesthesia or analgesia [4]. Thoracic epidural anesthesia with local anesthetics increases the diameter of stenotic epicardial coronary artery segments without causing dilation of coronary arterioles, decreases determinants of myocardial oxygen demand, improves left ventricular function and decreases anginal symptoms. Moreover, cardiac sympathectomy increases the endocardial to epicardial blood flow ratio, beneficially affects collateral blood flow during myocardial ischemia, and decreases post-stenotic vasoconstriction [5]. There was a satisfactory outcome after lower extremity revascularization with epidural anesthesia and analgesia. It was associated with beneficial effects on coagulation status and postoperative outcome compared with intermittent on-demand opioid analgesia [6]. Epidural local anesthesia blockade of afferent stimuli reduces endocrine and metabolic responses, and improves postoperative catabolism. Dynamic pain relief is achieved with improved pulmonary function and a pronounced reduction of postoperative ileus, thereby providing optimal conditions for improved mobilization and oral nutrition, and preservation of body composition and muscle function [7]. Anesthetic and analgesic techniques not only aim to provide suitable conditions for surgery but also to prevent postoperative complications and decrease postoperative morbidity and mortality [8]. However, the risk of severe postoperative neurologic dysfunction in patients with peripheral sensorimotor neuropathy or diabetic polyneuropathy undergoing neuraxial anesthesia or analgesia was found to be 0.4% [9]. Furthermore, epidural analgesia was found to be associated with a significant and beneficial modification of the neuroendocrine surgical stress response after major abdominal surgery in infants when compared to postoperative morphine infusions [10]. This study aimed to analyze the perioperative outcome of epidural anesthesia and analgesia.

OBJECTIVE

General Objective

- To see patients' satisfaction and perioperative outcomes of epidural anesthesia and analgesia.

Specific Objectives

- To see the potential and proven benefits of epidural anesthesia and analgesia.
- To see complications of epidural anesthesia and analgesia.

METHODS

This prospective observational study was conducted at the Department of Anesthesia, Upazilla Health Complex, Daganbhuiya, Feni, Bangladesh. The study was carried out from June 2020 to July 2021. A total of 110 patients were selected as study subjects as per inclusion criteria. Evaluation of all patients was done by medical history and physical examination. All

necessary investigations were done before applying anesthetic and analgesic medication and surgical procedures. Informed written consent was obtained from all study subjects. Perioperative outcomes were noted routinely. All data were kept confidential and used only for this study purpose. Ethical clearance was obtained from the ethical committee. All data were reorganized manually.

Inclusion Criteria

- Patients with surgical cases of lower abdomen and lower extremities.
- Patients with surgical cases of the cardiothoracic region.
- Patients with labor pain.
- Patients who had given consent to participate in the study.

Exclusion Criteria

- Patients with known cardiovascular disease.
- Patients with other chronic diseases.
- Younger than 21 years of age.
- Patients who did not give consent to participate in the study.

RESULTS

Out of 110 study subjects, 20 (18.19%) subjects were in the 25-30 years age group, 30 (27.27%) were in the 31-35 years age group and the rest 60 (54.54%) were in the >35 years age group [Table 1]. Regarding the region of surgery done, 50% of subjects underwent lower abdominal surgery, 20% underwent surgery of lower extremities, 15% underwent labor pain, and the rest 15% underwent cardiothoracic surgery [Figure 1]. Concerning intraoperative complication, hypotension was predominant which constituted 9% of total study subjects followed by nausea & vomiting seen in 3% of patients. 2.5% of patients had bradycardia, 2% experienced hypertension, only 1% of patients had tachycardia, and none experienced poor anesthesia [Figure 2]. In terms of postoperative complications, post-dural puncture headache was predominant which was seen in 4% of patients, 2% had prolonged ICU stay, 2% had cardiopulmonary complications, 1% had postoperative pain, 1% experienced occlusion of catheter and catheter fragment retention [Figure 3]. It was seen that 95.5% of total patients did not need ephedrine or atropine, only 2% of patients needed ephedrine during operation due to hypotension and 2.5% needed atropine during operation due to bradycardia [Figure 4]. Regarding the advantages of epidural anesthesia, reduced ileus was seen in 105 (95.45%) patients, reduced length of hospital stay in 108 (98.18%) patients, and reduced 30-day morbidity and mortality in 110 (100%) patients [Table 2]. The overall surgical outcome was excellent as well. In 98% of cases, the surgical outcome was satisfactory and only 2% showed poor surgical outcome [Figure 5].

Table 1: Age & sex distribution of study subjects (N=110)

Traits	N	%
Age (years)		
25-30	20	18.19
31-35	30	27.27
>35	60	54.54
Sex		
Male	70	63.63
Female	30	36.37

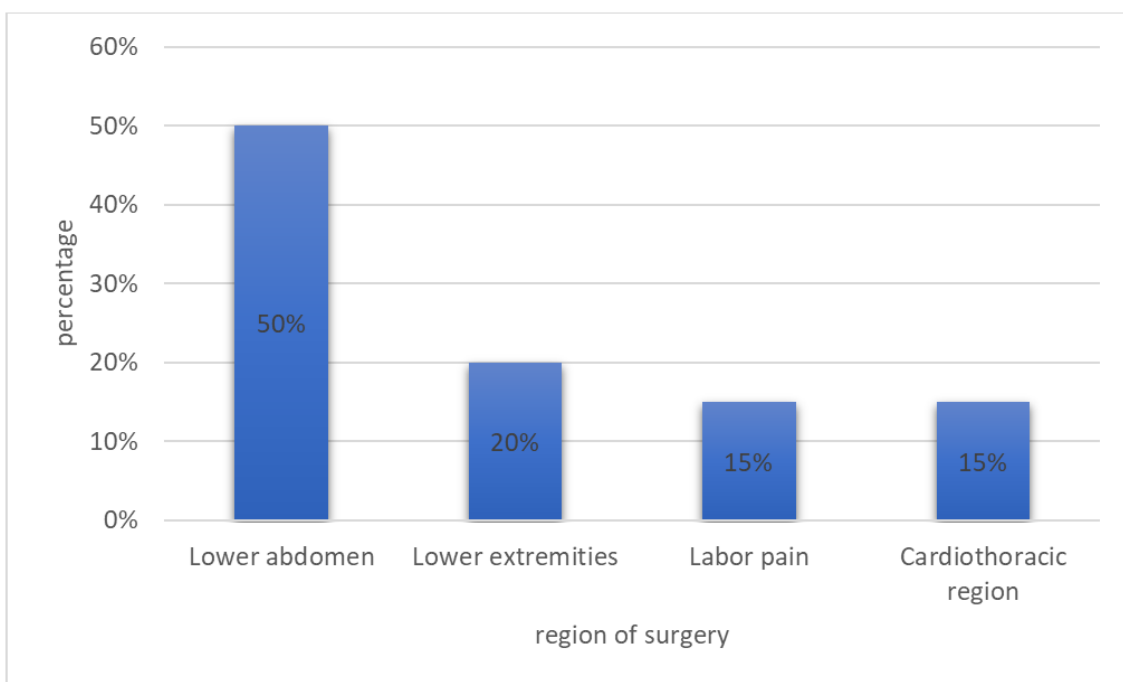


Figure 1: Distribution of subjects according to the region of surgery (N=110)

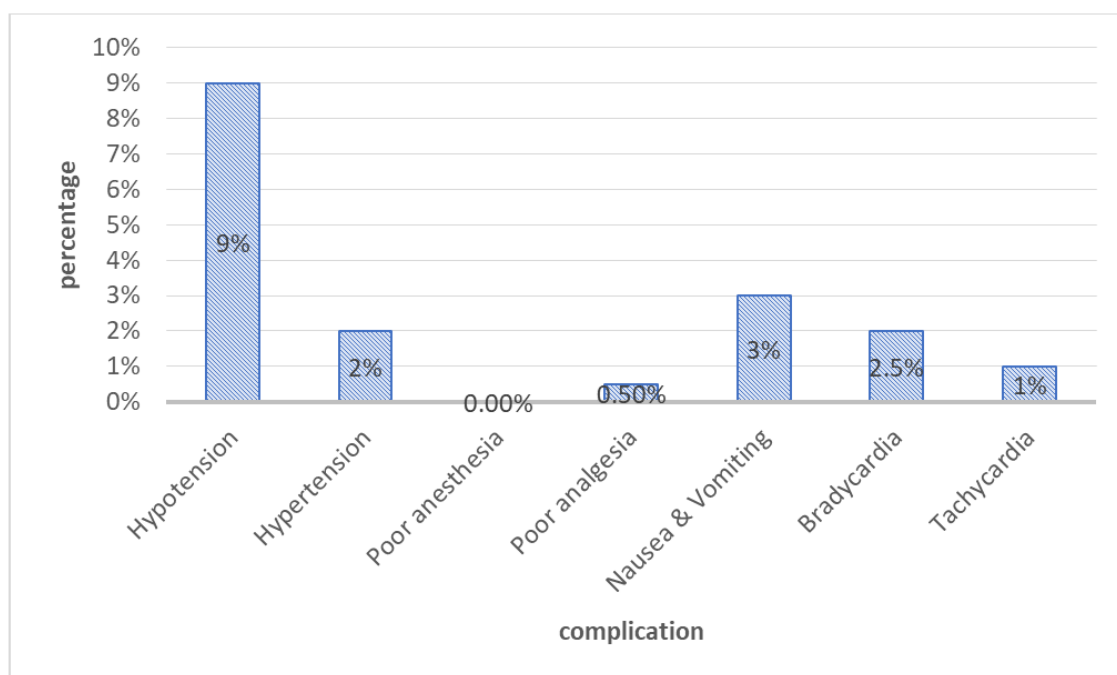


Figure 2: Distribution of subjects according to intraoperative complication (N=110)

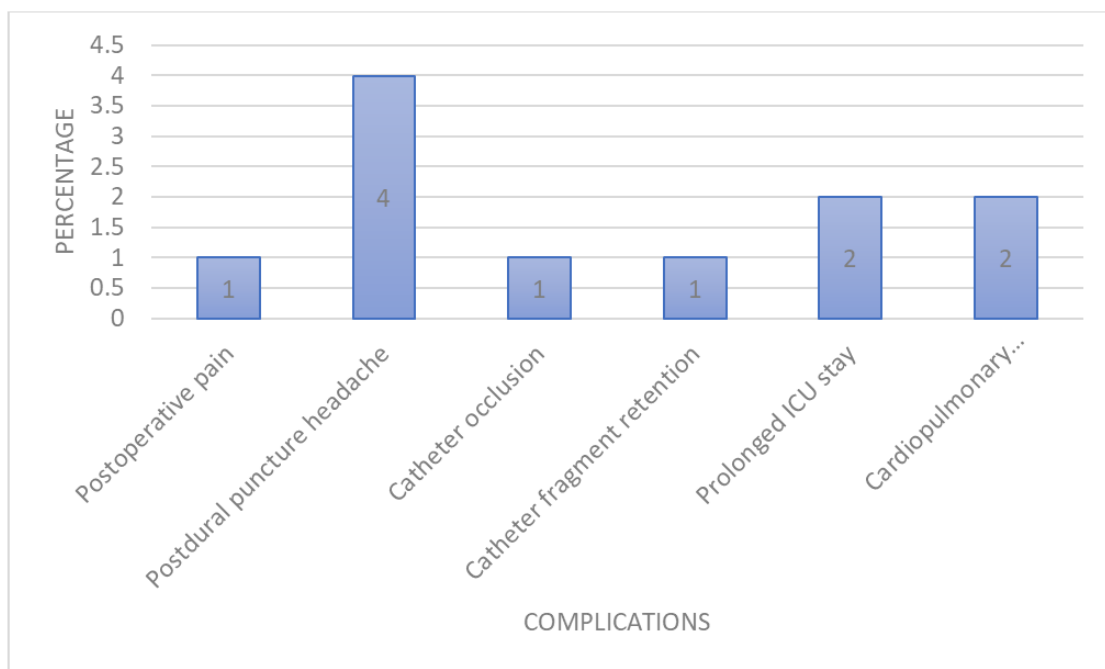


Figure 3: Distribution of subjects according to postoperative complications (N=110)

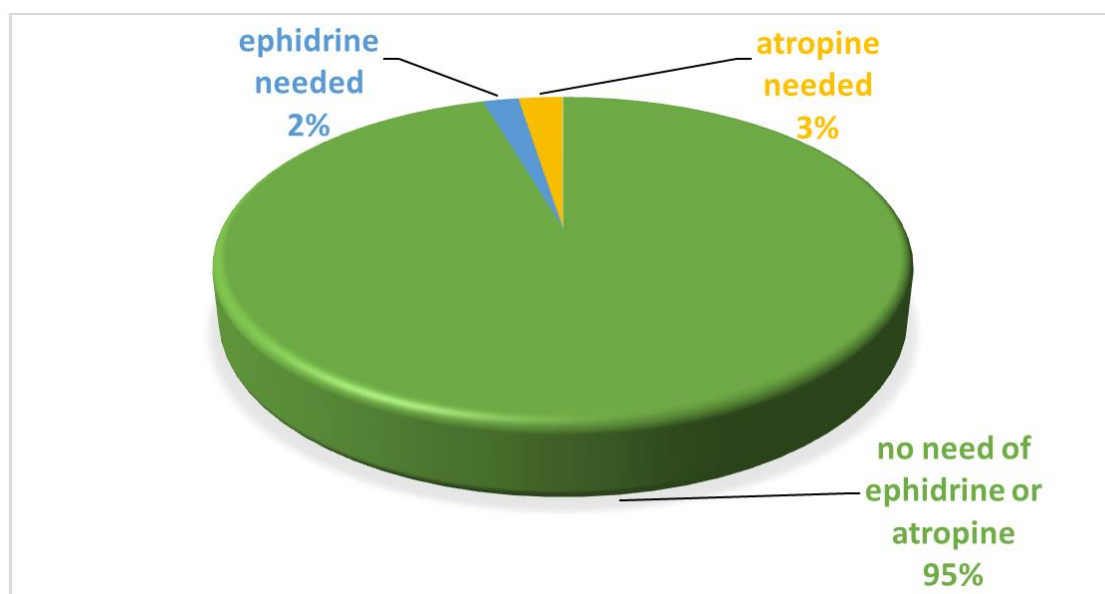


Figure 4: Distribution of subjects according to intraoperative management (N=110)

Table 2: Advantages of epidural analgesia and anesthesia (N=110)

Traits	N	%
Reduced ileus	105	95.45
Reduced length of hospital stay	108	98.18
Reduced 30-day mortality & morbidity	110	100



Figure 5: surgical outcome in epidural anesthesia (N=110)

DISCUSSION

Out of 110 study subjects, 20 (18.19%) subjects were in the 25-30 years age group, 30 (27.27%) were in the 31-35 years age group and the rest 60 (54.54%) were in >35 years age group in this study which correlate with another study which showed 15 patients were in 18-40 years of age group, 20 patients were in 41-60 years age group and 19 patients were in ≥61 years, age group [11]. Regarding the region of surgery done, 50% of subjects underwent lower abdominal surgery, 20% underwent surgery of lower extremities, 15% underwent labor pain, and the rest 15% underwent cardiothoracic surgery. Another study also portrayed a similar scenario [12, 13]. Concerning intraoperative complication, hypotension was predominant which constituted 9% of total study subjects followed by nausea & vomiting seen in 3% of patients. 2.5% of patients had bradycardia, 2% of patients experienced hypertension, only 1% of patients had tachycardia, and none experienced poor anesthesia. In terms of postoperative complications, post-dural puncture headache was predominant which was seen in 4% of patients, 2% had prolonged postoperative ICU stay, 2% had cardiopulmonary complications, 1% had postoperative pain, and 1% experienced occlusion of catheter and catheter fragment retention. Another study revealed, the same intraoperative complications including leg weakness and inflammation at the injection site. Indeed, most of the studies revealed that epidural anesthesia and analgesia provided complications only to a little number of patients. It also exerts a good outcome on the cardiovascular and endocrine systems which play a vital role during operations [14, 15]. Regarding the advantages of epidural anesthesia, reduced ileus was seen in 105

(95.45%) patients, reduced length of hospital stay in 108 (98.18%) patients, and reduced 30-day morbidity and mortality in 110 (100%) patients. A study also showed reduced ileus in a good number of patients in their study which was relatable to this present study [16, 17]. It was seen that 95.5% of total patients did not need ephedrine or atropine, only 2% of patients needed ephedrine during the operation due to hypotension and 2.5% needed atropine during the operation due to bradycardia, which indicated, a large proportion of patients did not need any support for hypotension and bradycardia. A study discussed the role of these drugs during operation which was significant [18]. The overall surgical outcome was excellent as well in this present study. In 98% of cases, the surgical outcome was satisfactory and only 2% showed poor surgical outcome. A study stated that epidural anesthesia and analgesia can provide a “stress-free” perioperative period which may attenuate or prevent detrimental physiologic responses and decrease resultant morbidity [19]. Another study also revealed good intraoperative and postoperative outcomes in surgeries with epidural analgesia and anesthesia [20].

Limitations of the Study

The study was conducted in a single hospital with a small sample size for a short duration. So, the results may not represent the whole community.

CONCLUSION

The epidural approach is a good choice of anesthesia and analgesia in labor pain as it blocks the pain sensation without involving the propelling ability of the patient for childbirth. Moreover, epidural local anesthetics could be included in a multi-modal

rehabilitation program after major surgical procedures to facilitate oral nutrition, improve recovery and reduce morbidity. The effect of anesthetic and postoperative analgesic techniques on perioperative outcomes varies with the type of operation performed. Overall, epidural analgesia provides better postoperative pain relief and surgical outcomes.

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Conflict of Interest: None declared.

Ethical Approval: The study was approved by the Institutional Ethics Committee.

RECOMMENDATION

The popularity of epidural anesthesia and analgesia continues despite some shifts in the practice preferences for a variety of clinical situations. Several clinical developments in equipment, techniques, and drugs for epidural anesthesia and analgesia have been recently reported which could be implemented for further beneficial effects of epidural anesthesia and analgesia.

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