

ORIGINAL RESEARCH

Role of propofol with total intravenous anaesthesia in intra -abdominal surgeries

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Abstract

Background: The present study was conducted for evaluating the role of propofol with total intravenous anaesthesia in intra-abdominal surgeries.

Materials & methods: One hundred patients were recruited to undergo intra-abdominal operations. All of the patients' clinical and demographic information was gathered. Demographic information, the kinds of surgeries done, whether ketamine was used intraoperatively, the amount of pain experienced during coughing (measured on a verbal numerical rating scale of 0 to 10, where 10 represents the greatest possible pain), and the total amount of morphine used after surgery were all included in the data collection.

Results: A total of 100 patients were enrolled. Mean urine output and mean bleeding was 199.1 ml and 459.2 ml respectively. mean VAS at immediate postoperative period, 6 hours and 12 hours postoperative was 0.85, 2.89 and 2.16 respectively. 31 percent of the patients required rescue analgesia.

Conclusion: Total intravenous anaesthesia with propofol among patients undergoing intra-abdominal surgery is an effective method regardless of patient-related risk factors.

Key words: Propofol, Anaesthesia, Intra-abdominal

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Introduction

Intra-abdominal surgeries are influenced by age, gender, ethnic origin, socioeconomic status, or accessibility to healthcare services. The lifetime risk of intra-abdominal surgery may provide useful information to assess the utilization of healthcare among ethnic groups. Such data may be useful to epidemiologists, health care providers, government agencies, and insurance companies. The appropriateness of performing incidental surgery can also be evaluated with the knowledge of the lifetime risk of intra-abdominal surgery.¹⁻³ Propofol (2,6-diisopropylphenol) is a potent intravenous hypnotic drug that was developed by Imperial Chemical Industries Limited (London, UK). Like most anaesthetics, propofol is a γ -aminobutyric acid (GABA) receptor agonist. It has a favourable pharmacokinetic (PK) and pharmacodynamic (PD) profile, which has resulted in it becoming the most commonly used intravenous anaesthetic for the past three decades. Its efficacy and utility has also been proven for sedation of patients in the intensive care unit (ICU) and conscious sedation of patients undergoing diagnostic or invasive procedures. The

adverse effects of propofol are well-documented, with the most common being pain on injection.⁴⁻⁶ Hence; the present study was conducted for evaluating the role of propofol with total intravenous anaesthesia in intra -abdominal surgeries.

Materials & methods

The present study was conducted for evaluating the role of propofol with total intravenous anaesthesia in intra -abdominal surgeries. One hundred patients were recruited to undergo intra-abdominal operations. All of the patients' clinical and demographic information was gathered. Demographic information, the kinds of surgeries done, whether ketamine was used intraoperatively, the amount of pain experienced during coughing (measured on a verbal numerical rating scale of 0 to 10, where 10 represents the greatest possible pain), and the total amount of morphine used after surgery were all included in the data collection. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software. Univariate analysis was done for evaluation of level of significance.

Results

A total of 100 patients were enrolled. Mean age of the patients was 48.3 years. Majority proportion of patients were males (72 percent). 68 percent of the patients were of urban residence. Mean weight and height were 72.3 Kg and 1.73 cm respectively. Mean anaesthesia time and mean operative time was 193.7

minutes and 169.5 minutes respectively. Mean urine output and mean bleeding was 199.1 ml and 459.2 ml respectively. mean VAS at immediate postoperative period, 6 hours and 12 hours postoperative was 0.85, 2.89 and 2.16 respectively. 31 percent of the patients required rescue analgesia.

Table 1: Preoperative and intraoperative variables

Variable	Mean	SD
Anaesthesia time (minutes)	193.7	27.2
Operative time (minutes)	169.5	21.8
Urine output (ml)	199.1	127.9
Bleeding (ml)	459.2	234.6

Table 2: Complications and VAS

Variable		Mean	SD
VAS	Immediate postoperative	0.85	1.32
	6 hours	2.89	1.68
	12 hours	2.16	1.27
Postoperative nausea		23 patients	23 percent
Requirement of rescue analgesia		31 patients	31 percent

Discussion

Intra-abdominal surgery is a broad term that includes various operations within the abdominal cavity that involve the gastrointestinal (GI) system, genitourinary system, gynaecological system, and endocrine system. This chapter, however, focuses mainly on surgical procedures involving the GI tract and addresses a general approach that may be applicable to many procedures within the abdominal cavity and specific GI disorders. Impaired gastric emptying due to obesity, bowel obstruction, or other disorders will lead to increased volume and acidity of the gastric contents. Abdominal surgery may be associated with significant fluid loss as well as significant fluid shifts. Surgical procedures and inflammatory processes in the abdomen may lead to intra-abdominal adhesions, preventing organ movement. Imaging for treatment planning is used to locate the tumor and to minimize the exposure of ionizing radiation to the tissues at risk.^{7, 8} Propofol is an intravenous anesthetic used for procedural sedation, during monitored anesthesia care, or as an induction agent for general anesthesia. It may be administered as a bolus or an infusion, or some combination of the two. Like most general anesthetic agents, the mechanism of action for propofol is poorly understood but thought to be related to the effects on GABA-mediated chloride channels in the brain. Propofol may work by decreasing the dissociation of GABA from GABA receptors in the brain and potentiating the inhibitory effects of the neurotransmitter. This, in turn, keeps the channel activated for a longer duration resulting in an increase in chloride conductance across the neuron, causing a hyper-polarization of the cell membrane, making it harder for a successful action potential to fire.^{9, 10} Hence; the present study was conducted for evaluating the role of propofol with total intravenous

anaesthesia in intra -abdominal surgeries. A total of 100 patients were enrolled. Mean age of the patients was 48.3 years. Majority proportion of patients were males (72 percent). 68 percent of the patients were of urban residence. Mean weight and height were 72.3 Kg and 1.73 cm respectively. Mean anaesthesia time and mean operative time was 193.7 minutes and 169.5 minutes respectively. Several in-vivo and in-vitro studies have proven propofol's free radical scavenging properties either by directly chelating reactive oxygen species with the formation of propofol-derived phenoxyl radicals, inhibiting lipid peroxidation or increasing the anti-oxidant defence capacity. In addition, several clinical studies spanning coronary artery bypass graft surgery, liver transplant and orthopaedic surgical procedures requiring tourniquet, have demonstrated that the use of propofol as the anaesthetic agent reduced the serum levels of malondialdehyde, which is a metabolite of lipid peroxidation. Other mechanisms that have been linked to propofol's potential organ protective effect include anti-apoptosis via the suppression of pro-apoptotic protein Bax and an anti-inflammatory effect via inhibition of macrophage production of tumour necrosis factor (TNF) α and interleukins.^{11- 15} In the present study, mean urine output and mean bleeding was 199.1 ml and 459.2 ml respectively. mean VAS at immediate postoperative period, 6 hours and 12 hours postoperative was 0.85, 2.89 and 2.16 respectively. 31 percent of the patients required rescue analgesia. In another previous study conducted by Wong et al, authors compared the postoperative analgesic effect of propofol total intravenous anaesthesia (TIVA) versus inhalational anaesthesia (GAS) in patients using morphine patient-controlled analgesia (PCA). Propofol TIVA was associated with statistically significant, but small reduction in pain scores and opioid consumption

in patients using PCA morphine.¹⁶Yoo YC et al, authors investigated the effect of total intravenous anesthesia (TIVA) with propofol on postoperative nausea and vomiting (PONV) after robot-assisted laparoscopic radical prostatectomy (RLRP) in patients at low risk of developing PONV, in comparison to balanced anesthesia with desflurane. The incidence of nausea in the post-anesthetic care unit was 22.6% in the Des group and 6.5% in the TIVA (p=0.001) group. The incidence of nausea at postoperative 1-6 hours was 54.8% in the Des group and 16.1% in the TIVA group (p=0.001). At postoperative 6-48 hours, there were no significant differences in the incidence of nausea between groups. In order to prevent PONV after RLRP in the early postoperative period, anesthesia using TIVA with propofol is required regardless of patient-related risk factors.¹⁷

Conclusion

Total intravenous anaesthesia with propofol among patients undergoing intra-abdominal surgery is an effective method regardless of patient-related risk factors.

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