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Intravenous Lidocaine Survey: Clinical Practice Impact of Published Data

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Abstract

Introduction: In the last decade several scientific publications have been published regarding intravenous Lidocaine and the potential benefits of its use in perioperative medicine. Lidocaine seems to have analgesic, anti-hyperalgic and anti-inflammatory features and it has shown benefits in reducing opioid requirements and surgical stress in laparoscopic abdominal surgeries. There appears to be no audits published on intravenous Lidocaine use on anesthetic daily practice. Our aim was to evaluate the impact of the published data on intravenous Lidocaine (IVL) benefits in perioperative medicine on our clinical practice.

Methods: A retrospective observational study was conducted in March 2017. A survey was performed from 10th to 20th March 2017, directed to all practitioners in our institutional anaesthesiology department, to audit the use of IVL.

Results: A total of 82 (69.5%) complete questionnaires were retrieved. All the responders had already administrated IVL in the perioperative period. Most frequent reported motives for IVL administration included diminished pain of propofol administration, improved hemodynamic profile, reduced surgical stress and better analgesia. 40% of the anesthesiologists that answered the audit questionnaire used it during abdominal procedures. The majority (69%) reported to stop the IVL infusion at the end of the surgical procedure. No major negative consequences were attributed to IVL usage, nor did patients' outcome have any drawbacks.

Conclusion: Our survey results reflected a clinical practice in line with the published literature. It seems that anesthesiologists are aware of IVL benefits and recognize them, and it is an area being currently explored. As an anaesthesia Department accredited by the European Society of Anaesthesiology (Hospital Visiting and Training Accreditation Programme-HVTAP) it is important to confirm that our practice is meeting the advances and recommendations reported on recent international literature.

Keywords: Intravenous lidocaine; Inflammation; Surgical stress; Anaesthesia; Clinical practice; Audit; Literature impact; Analgesia

Introduction

In the last decade several scientific publications have been published regarding intravenous Lidocaine (IVL) and its potential benefits in perioperative medicine. It seems relevant to understand the impact of such literature on our clinical practice. There seems to be no audits published on intravenous Lidocaine use on anesthetic daily practice.

Lidocaine administered intravenously seems to have analgesic, anti-hyperalgic and anti-inflammatory properties, as it not only blocks sodium channels, but also uncouples G protein, blocks NMDA (n-Metil D-aspartate) receptors, reduces circulating inflammatory cytokines and prevents secondary hyperalgesia and central sensitization [1,2]. IVL has multiple applications, including diminishing pain of propofol administration [3], reducing hemodynamic response to laryngoscopy [4], and providing an opioid-sparing effect in the perioperative period.

Several studies and meta-analyses show that perioperative IVL infusion is effective in reducing pain, opioid requirements, ileus duration, postoperative nausea and length of hospital stay. This benefits are more consistently observed in surgical procedures such as open and laparoscopic abdominal, thoracic, spine and ambulatory surgeries [2,5]. Other studies found evidence of benefits in acute and chronic pain conditions, although the doses to be used or patient selection are not fully defined [1].

Being part of a university hospital and an accredited anaesthesia service by the European Society of Anaesthesiology (ESA), we believe that it is crucial to keep updated on the new research themes and current medical practices. Our clinical daily practice must meet high standards of quality and follow international published recommendations.

The objective of this study was to conduct an audit to evaluate the clinical practice impact of the recent published data about IVL in our department.

Methods

A retrospective observational study was conducted in March 2017. After Risk Management, Health and Safety & Hygiene Institutional Department approval a survey was performed from 10th to 20th March 2017, directed to all practitioners in our institutional anaesthesiology department, to audit the use of IVL. Answers were kept anonymous.

Analyzed variables included demographic parameters (age, gender, years of anaesthesiology practice), use of intravenous Lidocaine (bolus, perfusion or both), purpose of its administration, perfusion duration (perioperative, 1h postoperative (PO), 2 h PO and more than 2 h PO), surgical procedures and attributed complications and side effects and their treatment. Descriptive statistics were performed using SPSS V24.0.

Results

A total of 82 (69.5%) complete questionnaires were retrieved from the 118 anaesthesiologists (Table 1). Average responders' age was 38.7 years. Regarding clinical experience, 41.5% (n=34) were residents and 40.2% (n=33) had more than 10 years of senior practice (Table 1).

All the responders had already administrated IVL in the perioperative period; 34 (41%) had used IVL in perfusion, regardless of the use of an initial bolus.

Considering the purpose of IVL administration, most reported motives included: diminishing pain of propofol administration, improving hemodynamic profile (during laryngoscopy and intraoperative), reducing surgical stress and providing better analgesia (including references to its use as an adjuvant to opioid drugs and its opioid-sparing effect). Figure 1 display all the motives stated for IVL choice in the perioperative setting.

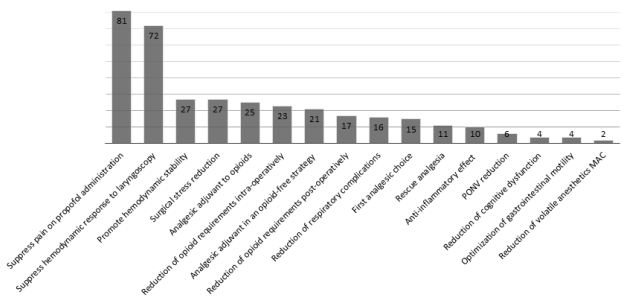

Figure 1: Purpose of intravenous Lidocaine use.

IVL was used in a wide range of surgical procedures. 40% of the inquiries used it during abdominal procedures (laparoscopic and open) but there were also references to orthopedic, neurosurgery and plastic surgeries (Table 2).

The majority (69%) of the inquiries reported to stop the IVL infusion at the end of the surgical procedure, while 16% stopped it less than one hour PO, 16% one to two hours PO and only 6% maintained it for more than 2 h PO. There were 5 adverse-effects reported attributed to Lidocaine administration, without major consequences: bradicardia (n=2), oral paresthesia (n=1), buzzing (n=1) and a patient with nonspecific neurologic symptoms (n=1). Patients' outcome was not altered due to IVL usage.

Gender	**N**
Female	62
Male	20
Category	
Specialist >20 y	15
Specialist 11-20 y	18
Specialist 6-10 y	10
Specialist ≤ 5 y	5
Resident >2 y	18
Resident ≤ 2 y	16
Total	**82**

Table 1: Anesthesiologists distribution by gender and years of practice.

Surgical Area	**Surgical procedure**	**N (n=82)**
Abdominal	Gastric bypass	7
	Non-specified laparoscopic	4
	Gastrectomy	3
	Colectomy	2
	Duodenopancreatectomy	2
	Major general surgery (Non-specified)	2
	Anterior rectal resection	1
	Esophagectomy	1
	Laparoscopic Colectomy	1
	Laparotomy	1
	Non-specified	8
Orthopedic	Spine	2
	Non-specified	1
Plastic	Flap	2
ORL	Laryngectomy	1
	Non-specified	2
Neurosurgery	Non-specified	2
Cardiology procedures	Non-specified	1
Maxillofacial	Non-specified	1
Gastroenterology	Non-specified	1

Table 2: Areas and surgeries in which anaesthesiologists use IV Lidocaine perfusion.

Discussion

The advantages of IVL use in perioperative scenarios are recently being explored in medical literature. Numerous meta-analysis and systematic reviews consistently report diminished pain scores and opioid requirements with IVL use namely during abdominal surgery.

Considering the vast literature published on this subject, we decided to investigate its influence on the clinical practice of our department, developing a survey on IVL usage.

All responders reported to have already administrated IVL, many in their daily practice, mostly to reduce surgical stress and improve analgesia and hemodynamic profile of patients. This is in line with the existing studies that state better analgesia profiles with opioid-sparing effect as advantages of IVL use. Also as predicted, most reported to use IVL during abdominal surgeries, but new surgical fields are being discovered.

After implementation of clinical protocols to inform on IVL benefits and risks and standardize its administration, we aim to re-audit our department and to understand the changes obtained by the promotion of clinical discussion.

The rate of responses might be considered a limitation of the study. Additionally it must be bore in mind that residents' answers may in fact reflect, and so duplicate, the clinical practice of the senior anesthesiologists. However one may also state that it can help to improve the information regarding some non-responder senior practitioners. In a future study different surveys or a separate analysis might be considered.

Conclusion

This study allowed us to understand the current clinical practice of our department. It seems that anaesthesiologists are aware of IVL benefits and recognize them, and it is an area being currently explored.

As an ESA accredited anaesthesia Department it is important to confirm that our practice is meeting the advances and recommendations reported on recent international literature. This knowledge enables the creation of clinical protocols to improve and standardize our clinical practice. It is also imperative to reflect on how literature influences our work, how it triggers clinical practice changes and how we can audit it to learn from it.

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