PROTOCOLS OF ANALGESIA IN IMMEDIATE POSTOPERATIVE PERIOD IN UROLOGICAL SURGERY. EVALUATION OF PAIN AND SATISFACTION OF THE PATIENT IN THEIR APPLICATION

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Summary. OBJECTIVES: The objective of this work was to establish the analgesia protocols for different types of urological surgery and to analyze the impact on pain during the first 24 h after surgery. 

METHODS: The study included 186 patients undergoing urological surgery between 2011 and 2013. Seven analgesia protocols were established and applied according to the surgical procedure. At 24 h postsurgery, i.e., the initiation of analgesic treatment, patients’ pain was evaluated by visual analog scale/numeric scale (VAS/NS), and their degree of satisfaction and nausea were assessed.

RESULTS: The study sample comprised 137 males (73.7%) and 49 females (26.3%), with a mean age of 58.5±14.7 yrs. Analgesia protocol 1 was applied in 5.9% of patients, protocol 2 in 17.8%, protocol 3 in 8.6%, protocol 4 in 38.9%, protocol 5 in 13.5%, protocol 6 in 14.6%, and protocol 7 in 0.5%.

At 24 h postsurgery, the VAS/NS score was ≤ 3 in 82.3% of patients; hence, only 17.7% required rescue analgesia; 71% of patients were highly satisfied with the treatment provided and 22.6% were satisfied. 6.4% were not satisfied.

CONCLUSION: Establishing analgesia protocols according to the type of surgery is a valid and useful measure to control postoperative pain during the first 24 h and to provide appropriate treatment standardization and follow-up.

Keywords: Analgesia protocols. Urological surgery. VAS/NS. Postoperative

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Resumen. OBJECTIVO: El objetivo de este estudio es establecer unos protocolos de analgesia distribuidos según tipos de cirugías urológicas y analizar el impacto sobre el dolor en las primeras 24 horas tras la cirugía.

MÉTODOS: Estudio con 186 pacientes intervenidos de cirugía urológica entre 2011 y 2013 en los que se
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INTRODUCTION

The current definition of pain by the International Association for the Study of Pain (IASP) refers to a nociceptive or sensory component and an affective or reactive component (1). The intense pain produced by surgery can be divided into superficial pain (by nociceptive impulses that originate in skin, subcutaneous tissues, and mucosae), profound somatic pain (originating in tendons, muscles, joints, or bones) and visceral pain (from an abnormal organ function) (2, 3). Pain is a complex process that involves three neuronal pathways and is mediated by chemical substances and by pain modulation at peripheral, medullar, or supraspinal level (2-4); hence, the management of pain must be multimodal.

It is essential to establish analgesia protocols according to the type of surgery, with the aim of controlling pain and achieving effective analgesia (5). In urology, it is crucial to set guidelines for each procedure, given the range of surgical treatments and the need to avoid the overprescription of certain drugs (6, 7). In urological surgery, analgesic treatment in the immediate postoperative period usually involves the intravenous (iv) injection of NSAIDs and/or opiate analgesics, which can now be controlled by patients using an infusion pump that is activated according to their needs (5, 8). However, the epidural route is increasingly used for pain control in urological surgery patients, with good outcomes (9-11).

Postoperative pain can be evaluated with different scales and methods, including the visual analog scale (VAS), numeric scale (NS), categorical scale (CS), and McGill questionnaire, among others (12), which offer guidance on the degree and level of pain and on the effect of analgesic treatments.

The objective of this study was to establish a series of analgesia protocols for different types of urological surgery and to evaluate the pain of patients, using VAS/NS, and their degree of satisfaction at 24 h post-surgery.

MATERIAL AND METHODS

The study included 186 patients undergoing urological surgery at our hospital between November 2011 and June 2013. The following analgesia protocols (Figure 1) were established for the different types of surgery in accordance with the guidelines of the anesthesia department:

Protocol 1 (for Radical Cystectomy):

- Epidural analgesia with 0.125% levobupivacaine (6ml/h) plus iv injection of 8 g metamizoline in 500 cc saline solution every 24 h.
- In patients with VAS/NS > 3, rescue analgesia A*.

Protocol 2 (for vesical transurethral resection (TUR), prostate TUR, urethroscopy, ureteroscopy, and urethrotomy):

- iv analgesia with 2 g metamizole every 6 h.
- In patients with VAS/NS > 3, rescue analgesia A*.

Protocol 3 (for hydrocelectomy, varicocelectomy, orchiectomy, penis surgery, urethroplasty, and urinary incontinence surgery with mesh):

- iv infusion with 8 g metamizole in 500 cc saline for 24 h.
overprescription in patients with VAS/NS > 3, rescue analgesia A*.

Protocol 4 (for laparoscopic radical prostatectomy and percutaneous nephrolithotomy):

- over prescription iv infusion with 8 g metamizolein 500 cc saline for 24 h plus 50 mg iv dexketoprofen every 8 h. In patients with creatinine > 1.5 mg/dl, dexketoprofen is replaced with 1 g paracetamol i.v.
- overprescription in patients with VAS/NS > 3, rescue analgesia B**.

Protocol 5 (for radical or partial laparoscopic nephrectomy and laparoscopic pyeloplasty, and other less frequent retroperitoneal procedures):

- i.v. infusion with 8 g metamizolein 500 cc saline for 24 h plus 50 mg dexketoprofen i.v. every 8 h (replace with 1 g paracetamol i.v. / 8 h if creatinine > 1.5 mg/dl).
- in patients with VAS/NS > 3, rescue analgesia B**.

Protocol 6 (epidural approach for radical or partial laparoscopic nephrectomy and laparoscopic pyeloplasty and other less frequent retroperitoneal procedures):

- 0.125% levobupivacaine (6 ml/h) via epidural catheter plus 2 g metamizol i.v. / 6 h.
- in patients with VAS/NS > 3, rescue analgesia A*.

Protocol 7 (for adenomectomy):

- i.v. infusion of 8 g metamizoleplus 300 mg tramadol plus 20 mg metoclopramide in 500 cc saline solution for 24 h.
- in patients with VAS/NS > 3, rescue analgesia A*.

*Rescue analgesia A: 50 mg dexketoprofen i.v. every 8 h. In patients with creatinine > 1.5 mg/dl, dexketoprofen is replaced with 1 g paracetamol i.v.

**Rescue analgesia B: infusion of 100 mg tramadol for 30 min, maximum 300 mg /day.

In all protocols, 4 mg ondansetron i.v. is added if the patient presents with nausea or vomiting.

At 24 h after beginning each protocol, the level of pain was studied with VAS/NS (Figure 2), and the degree of satisfaction of the patient and the presence or not of nausea were recorded.

RESULTS

The study sample comprised 137 males (73.7%) and 49 females (26.3%), with a mean age of 58.5±14.7 yrs. Analgesia protocol 1 was applied in 5.9% of patients, protocol 2 in 17.8%, protocol 3 in 8.6%, protocol 4 in 38.9%, protocol 5 in 13.5%; protocol 6 in 14.6%; and protocol 7 in 0.5%.

At 24 h post-surgery, the VAS/NS score was ≤ 3 in 82.3% of patients (Figure 3); hence, only 17.7% required rescue analgesia. A high degree of satisfaction with the treatment was reported by 71% of patients, while 22.6% were satisfied. Only 6.4% of patients were not satisfied. Nausea during the first 24 h was reported by 2.7% of patients in all protocols, who were treated with ondansetron, as noted above.

Protocols 5 and 6 were applied for the same types of surgery, but the main analgesia was delivered by epidural route in protocol 6. No significant differences in VAS/NS, degree of satisfaction, or nausea were observed between patients treated with these two protocols. We cannot choose in favor of a route of administration or another, being both valid and with similar results.
DISCUSSION

Over the past few years, urology has made an important commitment to the use of minimally invasive surgery, introducing multiple laparoscopic techniques alongside pre-existing minor or endoscopic surgical approaches. Therefore, the current and future portfolio of urology departments includes laparoscopic surgery, endoscopic surgery, and minimally aggressive open surgery procedures (13). In parallel to these changes in urologic surgery, there have been advances in anesthetic techniques and in the use of intra- and post-operative analgesics, designed to improve the quality of life of patients during the first hours post-surgery (14, 15).

Different authors have proposed measures to improve the control of postoperative pain in urologic surgery (16) and to reduce the use of opioids (17). These measures include local anesthetic infiltration in the surgical wound in patients after infra- or supra-umbilical laparotomy (17, 18). Local anesthetics, such as bupivacaine or levobupivacaine, have been successfully used not only in laparotomy wound infiltration but also in the infiltration of laparoscopic ports and nephrostomy tracts after percutaneous nephrolithotomy (19, 20). In daily practice, we prefer the epidural administration of local anesthetics, using levobupivacaine for its lower toxicity and achieving a more effective and uniform analgesia. In major abdominal surgery, e.g., cystectomy and renal or adrenal laparoscopic surgery, we routinely use epidural catheter with levobupivacaine infusion, with good pain VAS/NS results. In transurethral procedures, intraoperative spinal anesthesia has demonstrated an improved analgesic outcome during the first 2 h post-surgery; however, general anesthesia is superior for tumors with a large surface area and for more prolonged surgery (21). We prefer spinal anesthesia and subsequent postoperative control with i.v. analgesia in patients undergoing transurethral or endoscopic surgery, obtaining good outcomes and patient satisfaction levels.

The use of epidural anesthesia associated with general anesthesia can be a valid option in pelvic surgery, mainly in the treatment of prostate cancer by laparoscopic radical prostatectomy, and

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**PROTOCOLOS DE ANALGESIA**

**Protocolo 1**
- Analgesia epidural levobupivacaina 0,125% 6 ml/hora + analgesia i.v. 8 gr de metamizol / 24 horas en fisiológico de 500 cc.

**Protocolo 2**
- Analgesia iv con metamizol 2 gr cada 6 horas

**Protocolo 3**
- Analgesia iv con 8 gr de metamizol en suero de 500 cc a pasar en 24 horas

**Protocolo 4**
- Analgesia iv 8 gr de metamizol en suero de 500 cc en 24 horas + dextroprofe 50 mg iv cada 8 horas (sustituirlo por paracetamol 1 gr iv / 8 horas si creatinina > 1,5 mg/dl)

**Protocolo 5**
- Analgesia iv con 8 gr metamizol en suero de 500 cc en 24 horas + dextroprofe 50 mg iv cada 8 horas (sustituirlo por paracetamol 1 gr iv / 8 horas si creatinina > 1,5 mg/dl)

**Protocolo 6**
- A través de catéter epidural perfusión de levobupivacaina 0,125% 6 ml/hora + metamizol 2 gr / 6 h iv.

**Protocolo 7**
- Perfusion iv de 8 gr de metamizol más 300 mg de tramadol + 20 mg de metoclopramida en suero fisiológico de 500 cc a pasar en 24 horas.

Figure 2. Visual Analog Scale / Numeric Scale. It is valued by the patient level 0-10 pain intensity.
good outcomes have been reported (22). However, we obtained good results and pain control during the first 24 h using only general anesthesia during surgery followed by continual i.v. analgesic infusion. In relation to continual analgesia infusion, some authors prefer patient controlled analgesia (PCA) with an infusion pump (23). It is a valid option that has not been considered in the present study, but that is currently being used in certain patients at our center.

As observed, various analgesic options are available for the postoperative care of urologic surgery patients, using different approaches: epidural; continual intravenous infusion, controlled or not by the patient; or wound infiltration, among others. Our guidelines are essentially based on i.v. analgesia in continual or scheduled infusion, adding epidural analgesia with levobupivacaine in some types of surgery. We obtained excellent pain and satisfaction outcomes using this approach, with a limited use of morphine-derived analgesics.

The application of specific analgesic protocols for different types of surgery favors optimization of treatment outcomes, control over costs, and an improvement in care quality.

CONCLUSION

Besides improving the quality of life of patients, these postoperative pain control protocols reduce the length of hospital stay because they are mainly based on NSAIDs and local anesthetics, avoiding the consumption of opiates and its numerous side-effects.

The application of effective analgesia protocols in urologic surgery facilitates the work of the professionals and increases the safety and well-being of patients, enhancing the quality of care.

REFERENCES AND RECOMMENDED READINGS

(*of special interest, **of outstanding interest)

9. Hergert M, Rosolski T, Lestin HG et al. Postoperative epidural analgesia—current status, indi-