Effectiveness of Postoperative Analgesia in the Management of Acute Pain in Day-Case Surgeries

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Abstract

Background: Surgery is the most common source of acute pain. Aim: To determine the intensity of acute pain following day case surgery and evaluate the effectiveness of the prescribed analgesics. Methods: A descriptive observational study carried out at the main operating and the Urology Outpatient theatre suites of the University College Hospital, Ibadan. Seventy consecutive adult patients presenting for day case surgeries between July and September 2013 were recruited. The procedures were stratified as follows: peripheral, groin/perineal, urologic/endoscopic or orthopedic/plastic surgeries. The prescribed postoperative oral analgesics were paracetamol alone or in combination with diclofenac, tramadol or both. Postoperative pain intensity was assessed on arrival in the recovery room and at 6, 12, 24, 48, & 72 hours using the Verbal Intensity Pain Scale (VIPS). The pain scores were presented as mean±SD at different time intervals for each stratified surgical procedures and analgesics using tables and frequency bar charts. A mean pain score of less than 2 for each category of surgical procedures or analgesics group was considered as satisfactory pain control and thus effective analgesia. Result: The overall prevalence of moderate to worst possible pain after surgery in this study was 54.3% on arrival in the recovery room. The mean pain score was greater than 2 at 6 hours postoperative in all surgical categories except in patients who had peripheral surgeries irrespective of single or combination analgesic therapy. Conclusion: A high proportion of patients arrived in the recovery room with a high pain score; measures to improve intraoperative analgesia should be employed.

Keywords: Analgesics, day-case surgeries, effectiveness, pain relief, pain score

Résumé

Contexte: La chirurgie est la source la plus fréquente de douleur aiguë. But: Déterminer l’intensité de la douleur aiguë après un cas de chirurgie de jour et évaluer l’efficacité des analgésiques prescrits. Méthodes: Une étude observationnelle descriptive réalisée à la salle principale d’opération et les suites de théâtre ambulatoire d’Urologie au Collège Hospitalier Universitaire, Ibadan. Soixante-dix patients adultes consécutifs se présentant pour des cas de chirurgies de jour entre juillet et septembre 2013 ont été recrutés. Les procédures ont été stratifiées comme suit: chirurgie périphérique, aine / périnéale, urologique / endoscopie ou chirurgie orthopédique / plastique. Les analgésiques oraux postopératoires prescrits étaient le paracétamol seul ou en combinaison avec le diclofénac, le tramadol ou les deux. L’intensité de la douleur postopératoire a été évaluée à l’arrivée dans la salle de récupération et à 6, 12, 24, 48 et 72 heures en utilisant l’échelle d’intensité verbale de l’intensité (VIPS). Les scores de douleur ont été présentés sous forme de moyenne ± écart-type à différents intervalles de temps pour chaque procédure chirurgicale stratifiée et analgésiques en utilisant des tables et des graphiques à barres de fréquence. Un score de douleur moyen inférieur à 2 pour chaque catégorie de procédures chirurgicales ou de groupe analgésique a été considéré comme un contrôle satisfaisant de la douleur et donc une analgésie efficace. Résultat: La prévalence globale de la douleur modérée à la pire possible après la chirurgie dans cette étude était de 54,3% à l’arrivée dans la salle de récupération. Le score moyen de la douleur était supérieur à 2 à 6 heures postopératoires dans toutes les catégories chirurgicales, sauf chez les patients ayant subi une intervention chirurgicale périphérique, quel que soit le traitement antalgique simple ou combiné. Conclusion: Une proportion élevée de patients est arrivée dans la salle de récupération avec un score de douleur élevé; des mesures visant à améliorer l’analgésie peropératoire devraient être utilisées.

Mots-clés: Analgésiques, Cas de Chirurgies de jour, efficacité, score de douleur, soulagement de douleur

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INTRODUCTION
An increasing proportion of surgical procedures are now performed as day-case surgeries in appropriately equipped health-care facilities to reduce the cost of hospitalization. Postoperative pain has been a major complication following day-case surgery and is one major reason for unplanned hospital admission.\[1\]

The aim of this study was to determine the intensity of acute pain following day-case surgery and evaluate the effectiveness of postoperative analgesic therapy on the pain experienced by patients, on arrival in the recovery room, and on getting home after discharge from the hospital.

PATIENTS AND METHODS
This is a descriptive observational study. Following Institutional Ethics Committee approval, a convenience sample of seventy consecutive adult patients aged between 18 and 65 years, scheduled for elective day-case surgery at the University College Hospital (UCH), Ibadan, was recruited to participate in the study. Written informed consent was obtained from each participant.

The surgical procedures were classified into the following four categories based on the parts of the body operated on: peripheral, groin/perineal, urologic/endoscopic, and orthopedic/plastic surgeries. The exclusion criteria included the inability to understand the study protocol and pain measurement tools used in the study, history of hypersensitivity to any of the analgesic drugs prescribed, history of alcohol abuse, and nonverbal patients. Data were collected over a period of 3 months (July to September 2013).

The postoperative analgesics prescribed were noted and classified as follows based on the surgeons’ prescribing pattern: single therapy of paracetamol (PCM) alone or combination analgesics consisting of PCM with diclofenac, tramadol, or both. PCM was prescribed as 1000 mg (2 tablets of 500 mg each) every 8 h; diclofenac was prescribed as 100 mg (2 tablets of 50 mg each) every 12 h; and tramadol was prescribed as 100 mg (2 capsules of 50 mg each) every 12 h. All analgesics were administered orally in the postoperative period over 3 days (72 h). The pain intensity (severity) was measured using Verbal Pain Intensity Scale (VPIS). On VPIS, score “0” means no pain, “1” means mild pain, “2” means moderate pain, “3” means severe pain, “4” means very severe pain, and “5” means worst possible pain. Research assistants were trained on how to use the pain rating scale to assess the intensity of pain of participants after surgery in the recovery room. Furthermore, the recruited patients were taught to grade the level of pain as no pain, mild pain, moderate pain, severe pain, very severe pain, and worst possible pain. The verbal scores were converted to the equivalent numerical scores before data analysis.

The immediate postoperative pain was assessed by research assistants using VPIS when the patient arrived in the recovery room. Thereafter, pain intensity was assessed at 6, 12, 24, 48, and 72 h postsurgery when patients have been discharged from the hospital. Communication with the patient was made using the mobile telephone system to assess pain intensity at the stated interval. The question asked was “How would you rate your pain now – Is it no pain, mild, moderate, severe, or very severe? And whatever the answer of the patient was, it was converted to the equivalent numerical score.

The outcome variable was intensity (severity) of postoperative pain, and the explanatory variables were sociodemographic characteristics, type of surgery, and analgesic drug administered. The pain intensity in the immediate postoperative period was presented as percentages or proportions, while the pain intensity scores at 6, 12, 24, 48, and 72 h following discharge home were presented as mean ± standard deviation. The analgesics prescribed for each category of surgical procedure were presented in bar charts. The proportion of patients with significant pain (moderate to severe/worst possible pain) in the immediate postoperative in each category of surgical procedure was presented as percentages and using bar chart. A mean pain score of <2 (as described above a score of 2 means moderate pain) for each category of surgical procedures or analgesics group was considered as satisfactory pain control and thus effective analgesia. This is similar to the method adopted by Cander et al.\[2\]

RESULTS
A total of seventy patients scheduled for elective day-case surgery at the UCH, Ibadan, participated in the study. Participants’ sociodemographic characteristics are as shown in Table 1.

Table 1: Participants’ sociodemographic characteristics
(n = 70)

| Variable                  | Frequency (%) |
|---------------------------|---------------|
| Age (years)               |               |
| 18-25                     | 18 (25.7)     |
| 26-40                     | 25 (35.7)     |
| 41-60                     | 18 (25.7)     |
| 61+                       | 9 (12.9)      |
| Sex                       |               |
| Male                      | 29 (41.4)     |
| Female                    | 41 (58.6)     |
| Marital status            |               |
| Single                    | 26 (37.1)     |
| Married                   | 43 (61.4)     |
| Separated/divorced        | 1 (1.4)       |
| Level of education        |               |
| None                      | 2 (2.9)       |
| Primary                   | 7 (10.0)      |
| Secondary                 | 16 (22.9)     |
| Tertiary                  | 45 (64.3)     |
| Category of surgery       |               |
| Peripheral surgeries      | 39 (55.7)     |
| Groin/perineal surgeries  | 20 (28.6)     |
| Urologic/endoscopic surgeries | 8 (11.4)   |
| Orthopedic/plastic surgeries | 3 (4.3) |
The procedures performed as day-case surgeries ranged from breast lump excisions to prostate biopsies and few orthopedic procedures as shown in Table 2.

Most of the procedures (65/70, 92.9%) were performed with local anesthesia (LA) infiltration using plain lidocaine or lidocaine with adrenaline, 3 (4.3%) patients had caudal anesthesia for urethroscopy and biopsy, 1 (1.4%) patient had general anesthesia with laryngeal mask airway insertion for excision of axillary lymph node, and 1 (1.4%) patient had low dose spinal anesthesia for biopsy of osteosarcoma tumor of the left femur. Two (2.9%) patients undergoing varicocelectomy with LA required sedation with intravenous diazepam and pentazocine during the procedure.

The analgesics prescribed for the different categories of surgeries are as shown in Figure 1.

The intensity of pain on arrival in the recovery room (immediate postoperative period) is as shown in Figure 2. The overall prevalence of moderate-to-severe (including very severe and worst possible) pain in this study was 54.3% (38/70) in the immediate postoperative period.

The mean pain score was >2 at 6 h postoperative in all surgical categories except in patients who had peripheral surgeries and <2 thereafter in all surgical categories except urologic/endoscopic surgeries irrespective of single or combination analgesic therapy as shown in Table 3. The analgesics prescribed satisfactorily controlled the intensity of pain as shown in Table 4. The mean pain score was <2 in all analgesics groups.

**DISCUSSION**

The overall prevalence of acute moderate-to-worst possible pain in the immediate postoperative period was 54.3% in this study similar to previous findings where the prevalence of severe pain in the immediate period after cesarean section surgery was reported as 54.6%. However, this prevalence is less when compared to the 68.7% reported from a tertiary...
Hospital in Nigeria and the incidence of 91.4% reported from an Ethiopian hospital.[4-5] The probable reasons for this observation may include the use of plain lidocaine in some instances for LA infiltration, while some surgeons used lidocaine with adrenaline due to lack of unit’s protocol or guidelines.

Achieving adequate postoperative pain relief should be a definitive goal of patient care in day-case surgery because pain is one of the most common postoperative symptoms as reported from previous studies.[6-7] In the year 2011, the International Association for the Study of Pain at the International Pain Summit in Montreal, Canada, declared that “Relief from pain is a fundamental right of every human being.”[8] In this study, the mean pain score in the immediate postoperative period in the recovery room was moderate to severe with mean >2 in all types of surgery except peripheral surgery where it was marginally 1.20 ± 0.97.

Inadequate patient preparation in the preoperative period might have contributed to this observation in addition to the intraoperative anesthesia or analgesia technique. Most patients in this study simply walked down to the surgical ward or the surgical outpatient clinic on the day of surgery having been booked for the surgery but without prior counseling on the day of surgery. Gramke et al.[9] in their study of predictive factors of postoperative pain after day-case surgery found that the presence of preoperative pain, younger age, and fear of short-term consequences of operation are the most important factors.[9] Furthermore, Granot et al.[10] observed that the assessment of preoperative catastrophizing tendency and anxiety may assist in the management of postoperative pain.[10] In addition, Stanley and Chinwe[11] reported the factors affecting perception and expression of pain to include lack of knowledge regarding the outcome of disease and lack of finance.[11] Therefore, necessary actions such as preoperative counseling to detect anxiety, administration of sedative agents in low doses, or use of short-acting general inhalational or intravenous agents should be considered and applied where necessary to allay anxiety and reduce postoperative pain.

In a recent review, it was recommended that surgeons in Nigeria should move toward establishing stand-alone day surgery unit (DSU).[12] Stand-alone DSU is often better equipped, well staffed with appropriate professional health-care personnel which enhances the preassessment of patients and promotes the use of protocol and guideline for the management of patients in general and acute postoperative pain in particular. Regular pain assessment using any of the validated pain measuring tools such as the VPIS used in this study will enhance the quality of pain management in the ambulatory setting.

In this study, the analgesics prescribed for postoperative pain management provided satisfactory pain control as revealed by the mean pain score obtained at different intervals during 72 h after surgery. This finding may not be unconnected to the type of surgery performed as a day-case procedure. Peripheral surgeries including excision of breast lumps, ganglion nodes, and lipoma form the bulk of surgeries performed as day-case procedures. In a guideline issued by the Association of Anaesthetists of Great Britain and Ireland, it was noted that the selection criteria for day-case surgical procedures should not include those surgery that are associated with significant complications such as hemorrhage or very severe pain.[12,13]

Administration of oral analgesics has been reported to be adequate for the management of the postoperative pain in the ambulatory settings.[14-16,13-15] Hence, drugs such as oral PCM, nonsteroidal anti-inflammatory drugs, and tramadol are often
prescribed as observed in this study. In a study comparing the effect of diclofenac sodium and morphine sulfate after day-case inguinal hernia surgery, it was concluded that diclofenac provided effective analgesia with more acceptable side effects’ profile compared to morphine sulfate.\[16,17\] In this study, the administration of oral analgesics reduced the mean pain score to between 1.0 ± 0.44 (PCM alone) and 1.90 ± 0.46 (PCM with tramadol and diclofenac) at 6 h after surgery and gradual reduction to between 0.23 ± 0.23 (PCM alone) and 0.6 ± 0.43 (PCM with tramadol and diclofenac) similar to the observation of Broome et al.\[15,16\] A cursory look at the interplay of intensity of pain and drug administration would suggest that the orthopedic and plastic surgeries are more painful than the other types of surgery. However, the small number of patients (n = 3) in this group may account for this observation. Level of significance of our findings was not determined because of the small sample size which is a limitation of this study. Therefore, large sample and probability studies are required to compare the analgesic effects of single therapy and combination analgesic therapy in the management of acute postoperative pain in day-case surgery.

A multidisciplinary team approach that included anesthetists has been shown to result in a better management of postoperative pain.\[18\] Postdischarge follow-up of patients as performed in this study is essential. Postdischarge telephone interview using standardized questionnaires would serve to provide feedback from patients as well as a means to improve the quality of service rendered to patients undergoing day-case surgery.

**Conclusion**

The prevalence of moderate-to-severe pain in patients presenting for day-case surgery in the immediate postoperative period at our institution was high. The prescribed postoperative analgesics were effective.

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**Conflicts of interest**

There are no conflicts of interest.

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