Severe Acute Postoperative Pain In Lubumbashi/Drc: Prevalence And Risk Factors

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Summary :
Introduction: *This survey aimed to study the prevalence and risk factors of severe acute postoperative pain in the population of Lubumbashi.*
Methods: *The present study was a cross-sectional analytical study. Data collection was prospective over 6 months, from May 1, 2023 to November 30, 2023. Any patient over the age of 18 who had undergone a surgical procedure under general anesthesia were included in this study. We used the Simple Verbal Scale (EVS) to assess postoperative pain intensity.*
Results: *During our investigation, we collected 174 patients. The male gender was represented at 58.04% vs. 41.95% for the female gender. The average age was 40.96 ± 18.32 years. 27.59% had severe pain, 31.03% moderate pain and 41.38% mild pain. Among the known general risk factors predisposing to severe postoperative pain, only the preoperative use of opiate derivatives (OR: 7.08; 95% CI: 1.17-42.79), the type of surgery (OR: 27.00; 95% CI: 1.37-530.79) and intraoperative administration of high doses of opiates (OR: 28.50; 3.27-248.18) were found to be risk factors predisposing to severe postoperative pain in Lubumbashi with a statistically significant p test of 0.032, 0.030 and 0.002 respectively.*
Conclusion: *According to this survey, the prevalence of severe postoperative pain was 27.59%. Risk factors were preoperative use of opioid derivatives, type of surgery and intraoperative administration of high doses of opioids.*
Keywords: *severe postoperative pain, prevalence, risk factors*

I. Introduction

Postoperative pain and its management represent recurring public health problems. Overall, nearly 313 million operations were performed in 2012 worldwide [1].

Pain in the postoperative context is an important issue [2] since it has numerous consequences. Unrelieved pain constitutes harmful physiological stress [3] causing an increase in heart rate and blood pressure, slowing gastric emptying, endocrine imbalances and a reduction in respiratory capacity [4,5]. The immobility resulting from pain favors the appearance of deep vein thrombosis and pulmonary embolism [2,3,5,6]. Psychological repercussions are possible, such as an increase in anxiety, the appearance of sleep disorders, fatigue, agitation, irritability, aggressiveness and, above all, the presence of suffering and emotional distress [5 , 7.8]. People with high levels of postoperative pain are also more likely to experience delirium [9,10]. All of these complications will ultimately result in unnecessarily prolonging the patient's length of stay in hospital [2,4,11]. . and even seeing the pain become chronic [12,13,14]. Given all the repercussions of postoperative pain that is poorly or inadequately relieved, it is essential to ensure effective management [15].

Even with a better understanding of pain mechanisms and advances in perioperative pain management, insufficiently controlled postoperative pain persists. Several studies demonstrate that patients' postoperative analgesia is largely unsatisfactory regardless of the context, even if there are periodically updated protocols and management standards.

According to the US Institute of Medicine, 80% of patients who undergo surgery report postoperative pain, with 88% of these patients reporting moderate, severe, or extreme levels of pain [16].

A French audit was published in 2008 by Fletcher et al. [17].and revealed that 51% of patients described severe pain – defined by a simple numerical rating scale (ENS) ≥ 7 [18] – after surgery, while 62%

received morphine and 95% received analgesics. non-opiates. Only 64% of patients received intraoperative analgesics.

In Africa, studies carried out on postoperative pain reveal almost the same trends as those in the rest of the world despite limited technical resources.

In South Africa, at the University of Stellenbosch, Murray and Retief in a study conducted in a reference hospital in Cape Town including 1231 postoperative patients reported that 62% of patients felt pain of moderate to severe intensity [19].

In the study by Masigati and Chilonga in Tanzania involving 124 patients aged at least 18 years, it appears that 45.2% of patients had moderate pain at rest and 44.4% had pain triggered by movements [20].

Implementation of appropriate preoperative screening methods may facilitate more aggressive pain treatments, specifically aimed at individuals at high risk of experiencing severe postoperative pain. This, in turn, may result in improved postoperative rehabilitation and reduced short- and long-term morbidity.

Currently, risk factors for severe postoperative pain have been determined and studies have made it possible to establish predictive scores [21,22]. These risk factors are easily identifiable during the pre-anesthetic consultation or even at the patient's bedside.

The objective of this survey was to study the prevalence and risk factors of severe acute postoperative pain in the population of Lubumbashi.

II.   Methods

Type and period of study: The present study was a cross-sectional analytical study. Data collection was prospective over 6 months, from May 1, 2023 to November 30, 2023.

Study setting: This study was carried out in three hospitals in the city of Lubumbashi, namely the university clinics of Lubumbashi, Medpark Clinic and Afia Don Bosco because of their technical platform, their reception capacity and their level of care. .

Study population and sampling: This study included any collaborating patient, aged over 18 years, who had undergone a surgical procedure under general anesthesia exclusively.

We will carry out exhaustive sampling.

• **inclusion criteria:** any collaborating patient, aged over 18 years, who agreed to undergo surgery under general anesthesia during our study period and who agreed to participate in the study.

• **non-inclusion criteria:** any non-collaborating patient or under the age of 18 who has undergone a surgical procedure under regional anesthesia or who has benefited from anti-hyperalgesics and who has not given their consent to participate in the study.

Variables studied:

• **Sociodemographic and anthropometric data:** Age, Sex, Weight, height, BMI,

• **Preoperative information:** Presence of chronic preoperative pain, a sensitivity disorder, use of analgesics preoperatively (paracetamol, NSAIDs, opiates, or others), state of dependence (drug addiction, tobacco, alcohol) and the psychological vulnerability (significant anxiety, depressive state)

• **Intraoperative information:** type of intervention, duration, is it a re-operation?, opioid used and its maximum dose, anesthesia techniques used.

• **Information on postoperative pain:** the simple verbal scale (EVS).

Statistical analyzes

Data entry and analysis were carried out using Epi info 7.2.5.0 and EXCEL software. The confidence interval was calculated for a risk of error of 5%.

A Student's T test will be used for quantitative variables and a Chi-square for qualitative variables. The significance threshold used is p<0.05.

III.   Results

During our investigation, we collected 174 patients undergoing surgery under general anesthesia.

1. Sociodemographic and anthropometric data

Table I: Sociodemographic and anthropometric data

Sex , (n =174)	
Male n(%)	101 (58,04%)
Female n(%)	73 (41,95%)
Age /year, (mean ± SD)	40,96 ± 18,32
BMI (mean ± SD)	25,40 ± 5,77

The average age of the patients was 40.96 years with a standard deviation of plus or minus 18.32 years. The male gender represented 58.04% of those operated on. The average BMI was 25.40 with a standard deviation of plus or minus 5.77.
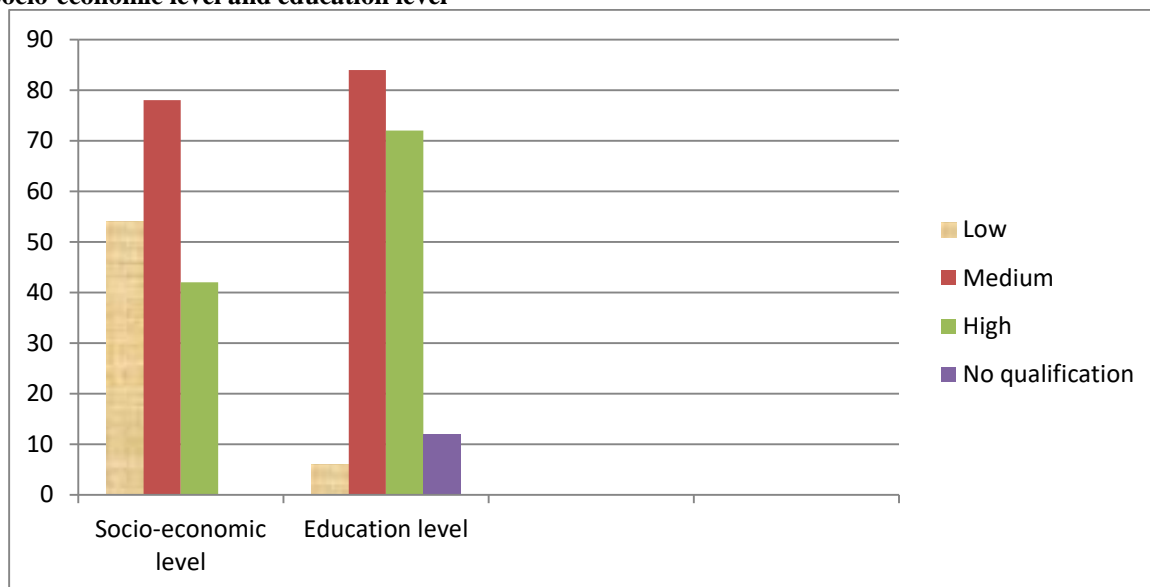
Socio-economic level and education level

Figure 1: Distribution according to socio-economic level and education level

44.82% of patients were of an average socio-economic level and 48.27% had an intellectual level equivalent to a baccalaureate.

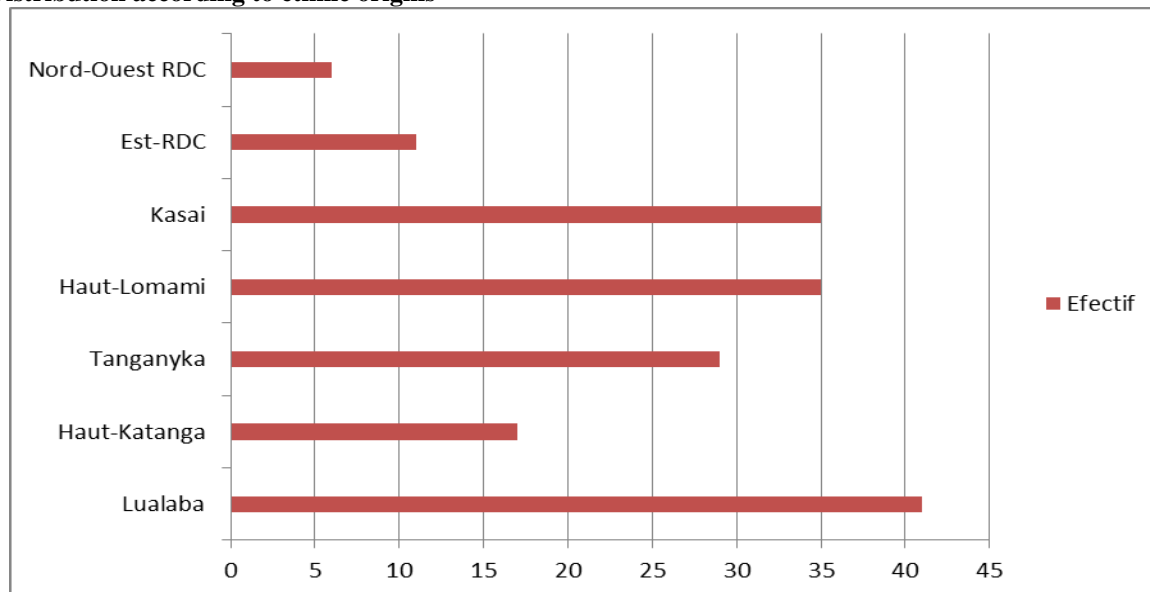**Distribution according to ethnic origins**

Figure 2: Distribution according to ethnic origins

The majority of patients came from the former Katanga province (Lualaba, Haut-Katanga, Haut-Lomami and Tanganyka).

2. Preoperative information

Table II: Information on factors predisposing to severe POP

Chronic preoperative pain	
Yes n(%)	30 (17,24)
No n(%)	144 (82,75)
Sensitivity disorders	
Yes n(%)	6 (3,44)
No n(%)	168 (96,55)
Analgesics used preoperatively	
None n(%)	51 (29,31)
NOA n(%)	78 (44,82)
Opioids n(%)	19 (10,91)
Opioids + paracétamol/NSAID n(%)	26 (14,94)
State of dependence	
None n(%)	96 (55,17)
Substance addiction n(%)	0 (0)
Tabacco n(%)	13 (7,47)
Alcohol n(%)	35 (20,11)
Psychological vulnerability	
None n(%)	114 (65,51)
Significant anxiety n(%)	36 (20,68)
Depressed state n(%)	24 (13,79)

*NOA: non-opioid analgesics   *POP: Postoperative pain

Compared to the presence of preoperative predisposing factors for severe postoperative pain, 17.24% of patients presented chronic pain preoperatively and 6% had sensitivity disorders such as localized hyperalgesia. 44.82% took non-opiate analgesics, 10.91% took opiates (tramadol) and 14.94% combined opiates (tramadol) and non-opiate analgesics. 20.11% of patients were alcoholics and 7.47% had tobacco dependence. 60 patients out of 174 presented psychological vulnerability, i.e. precisely 36 patients or 20.68% had significant anxiety and 24 or 13.79% had a depressive state.

3. Intraoperative information

All patients (100%) received general anesthesia with propofol, sevoflurane and fentanyl as analgesics. No patient had benefited from an antihyperalgesic such as ketamine or from an infiltration technique with local anesthetics in addition.

Table III: Information on the type of intervention

Type of surgery	n(%)
Abdominal surgery(laparotomy)	54 (31,03)
Breast surgery	6 (3,44)
ENT surgery	12 (6,89)
Orthopedic/trauma surgery	48 (27,58)
proctological surgery	6 (3,44)
Gynecology/obstetric surgery	30 (17,24)
Neurosurgery (spine surgery)	12 (6,89)
Urology	6 (3,44)
Duration of the surgery in minutes, (mean ± SD)	120,56 ± 74,29

Abdominal surgery by median laparotomy above and below the umbilical represented the large number of interventions, i.e. 31.03%, followed by orthopedic surgery, i.e. 27.58%, and gynecological surgery, i.e. 17.24%. The average duration of procedures was 120.56 minutes with a standard deviation of plus or minus 74.29 minutes and extremities ranging from 30 to 270 minutes.

4. Information on postoperative pain

Table IV: Distribution of patients according to the severity of postoperative pain

Mild pain	n(%)	72 (41,38)
Moderate pain	n(%)	54 (31,03)
Severe pain	n(%)	48 (27,59)

48 patients out of 174, or 27.59%, had severe postoperative pain.

5. General risk factors predisposing to severe postoperative pain
Sociodemographic factors

Table V: Level of study and socio-economic level

	n	OR	95%IC	p
Level of study				
High	30	2,70	0,50-14,54	0,245
Medium	12	0,30	0,04-1,86	0,197
Low	6	1,35	0,10-17,41	0,814
Socio-economic Level				
High	24	2,50	0,46-13,39	0,284
Medium	12	0,36	0,05-2,25	0,278
Low	12	1,06	0,16- 7,05	0,946

Table VI: Pain and ethnic group

	n	OR	95%IC	p
Lualaba	12	1,06	0,16-7,05	0,946
Tanganyka	12	2,00	0,26-14,98	0,499
Haut-Katanga	6	1,35	0,10-17,41	0,814
Kasai	6	0,68	0,06-6,88	0,748
Haut-Lomami	12	1,41	0,20-9,81	0,724

Table VII: Preoperative factors

	n	OR	95% IC	p
- Chronic preoperative pain	12/30	2,00	0,26 – 14,98	0,499
- Use of opiate derivatives	30/45	7,08	1,17 – 42,79	0,032
- State of dependence	12/78	0,50	0,08 – 3,69	0,542
- Psychological vulnerability	24/60	2,50	0,46 – 13,39	0,284
- female gender?	12/54	0,66	0,10 – 4,19	0,665
- Age (young people< 25 ans)	6/42	0,35	0,03 – 3,55	0, 380

Among the known general preoperative risk factors predisposing to severe postoperative pain, only the preoperative use of opiate derivatives was found to be the risk factor predisposing to severe postoperative pain with a statistically significant p test of 0.032.

Table VIII: Intraoperative factors

	n	OR	95% IC	p
- type of surgery	48/96	27,00	1,37–530,79	0,030
- administration of high doses of opiates	36/48	28,50	3,27–248,18	0,002
- type of anesthesia	48/174	0,39	0,007–21,57	0,649

Among the known general intraoperative risk factors predisposing to severe postoperative pain, only type of surgery and intraoperative administration of high doses of opioids were found to be risk factors predisposing to severe postoperative pain. with a statistically significant p test of 0.030 and 0.002 respectively.

6. Severe pain depending on the type of surgery

Table IX: Severe pain and type of surgery

Type d'intervention	n(%)
Hysterectomy	3 (6,25)
Spine surgery (arthrodesis)	4 (8,33)
Total hip replacement	10 (20,83)
Trauma surgery	7 (14,58)
Hémoroïdectomy	6 (12,50)
Midline laparotomy	12 (25,00)
Mastectomy with lymph node dissection	2(4,16)
ENT (amygdalectomy)	4(8,33)

IV.   Discussion

Sociodemographic data

Male patients were more represented than female patients, i.e. 58.62% vs. 41.37%. The mean age was 40.96 years with a standard deviation of plus or minus 18.32 years and ranges from 18 to 71 years. 44.82% had an average socio-economic level and 48.27% had a level of education comparable to that of a baccalaureate.

Information on factors predisposing to severe POP

17.24% of patients presented with chronic preoperative pain and 3.44% with sensitivity disorders. Concerning the use of analgesics preoperatively, 24.13% of patients were on opiates. 20.11% of patients were alcoholics and 7.47% had tobacco dependence. 60 patients out of 174 presented psychological vulnerability, i.e. precisely 36 patients or 20.68% had significant anxiety and 24 or 13.79% had a depressive state.

Ip et al. [23] recently published a review on the subject (48 studies, 23,000 patients) which shows that the independent predictive factors are the existence of preoperative pain, anxiety, age (higher risk if the subject is young) and the type of surgery. It is interesting to note that these risk factors, however, only make it possible to target 54% of patients at risk [24]. Preoperative pain is the most cited predictive factor, whether it is pain localized to the surgical site (e.g. hip, knee, etc.) or not.

Information on the type of intervention

Abdominal surgery by median laparotomy above and below the umbilical represented the large number of interventions, i.e. 31.03%, followed by orthopedic surgery, i.e. 27.58%, and gynecological surgery, i.e. 17.24%. This is in the same direction as the results found by Kabey et al who found that the most performed surgery in Lubumbashi was visceral, i.e. 46.7% [25]. The average duration of the interventions was 120.56 minutes with a standard deviation of plus or minus 74.29 minutes and extremities ranging from 30 to 270 minutes.

Postoperative Pain Information

In our study, 48 out of 174 patients, or 27.59%, had intense to extremely intense postoperative pain.

This rate is lower than that found by Fletcher et al. [17]. in 2008 revealed that 51% of patients described severe pain - defined by a simple numerical rating scale (ENS) ≥ 7. This difference can be explained by several situations, notably the nature of the surgical procedure and the treatment protocol. analgesia.

But close to the rate found in a systematic review of the literature in which pain scores were grouped from 165 studies on acute pain following major surgery (abdominal, thoracic, orthopedic and gynecological), in the first 24 Hours after surgery, the average incidence of moderate to severe pain and severe pain were 30% and 11%, respectively [26]. unlike our study where all patients benefited from the same analgesia technique, here the incidence of these pain levels varied depending on the analgesic technique: a lower incidence was reported with patient-controlled analgesia. and epidural compared to intramuscular analgesia [26].In a Dutch study of 1,490 hospitalized surgical patients, 41% of patients reported moderate or severe pain on the day of surgery.

General risk factors predisposing to severe postoperative pain

● **Preoperative factors**

Among the known general preoperative risk factors predisposing to severe postoperative pain, only the preoperative use of opiate derivatives was found to be the risk factor predisposing to severe postoperative pain with a statistically significant p test of 0.032 while many Studies associate the degree of anxiety with the intensity of postoperative pain as well as with the high consumption of analgesics [23,27,28]. A similar observation was made more recently by Aubrun et al. [29]: regular preoperative use of minor analgesics is associated with the severity of acute postoperative pain assessed in the recovery room. The intensity of preoperative pain also seems to be correlated with that of postoperative pain that the patient anticipates [30]. Taking analgesics, especially opioids, also contributes to preoperative sensitization of the central nervous system; it will have an additive effect on the sensitization generated by tissue damage following the surgical incision [31,32].

● **Intraoperative factors**

Among the known general intraoperative risk factors predisposing to severe postoperative pain, only the type of surgery and intraoperative administration of high doses of opiates were found to be risk factors predisposing to severe postoperative pain. with a statistically significant p test of 0.030 and 0.002 respectively.

The interventions where we noted intense to extremely intense postoperative pain were: hysterectomy (6.25%), spine surgery (arthrodesis) (8.33%), total hip replacement (20.83%). %), trauma surgery (14.58%), proctological surgery (12.50%), median laparotomy above and below the umbilical (25.00%), mastectomy with lymph node dissection (4.16%), tonsillectomies (8.33%).

The type of surgery is a major and understandable risk factor both with regard to the intensity of postoperative pain and the consumption of analgesics [23]. The most painful procedures involve prosthetic orthopedic surgery, thoracic surgery and incisional abdominal surgery. In outpatient surgery, ENT surgery, breast plastic surgery (prostheses), abdominal surgery and orthopedic surgery (arthroscopy) are the most painful [33].

Evidence from a prospective German cohort study of 50,523 patients from 179 surgical groups showed that pain scores on the first postoperative day were highest after obstetric and orthopedic/traumatic procedures, but scores were high even after the Common minor surgical procedures, such as appendectomy, cholecystectomy, hemorrhoidectomy, tonsillectomy and some laparoscopic procedures [34].

V. Conclusion

The prevalence of severe postoperative pain was 27.59%. Risk factors were preoperative use of opioid derivatives, type of surgery and intraoperative administration of high doses of opioids.

Conflicts of interest
This work was carried out without any conflict of interest.

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