

# Pain evaluation at the post-anesthetic care unit of a tertiary hospital

## *Avaliação da dor na sala de recuperação pós-anestésica em hospital terciário*

Priscila Scheffler Panazzolo<sup>1</sup>, Fernanda Duarte Siqueira<sup>1</sup>, Monique Pereira Portella<sup>1</sup>, Eniva Miladi Fernandes Stumm<sup>1</sup>, Christiane de Fátima Colet<sup>1</sup>

DOI 10.5935/1806-0013.20170009

### ABSTRACT

**BACKGROUND AND OBJECTIVES:** Pain is a major manifestation of patients in immediate postoperative period, being an individual and subjective complaint affecting patients' quality of life. This study aimed at evaluating the use of analgesics in the immediate postoperative period of patients assisted in a post-anesthetic care unit.

**METHODS:** Data were collected in the period from March to April 2016. This is a cross-sectional, quantitative study, carried out in the post-anesthetic care unit of a Level IV Hospital of Rio Grande do Sul. Short-form McGill pain questionnaire was used for socio-demographic and clinical characterization of patients.

**RESULTS:** Participated in the study 336 patients, most (68.8%) female and elderly. Body mass index (BMI) was higher than 25, indicating overweight or obesity. Perioperative opioid analgesics were used by 266 patients. There has been statistical association between no postoperative pain and the use of any opioid. Most frequent class of drugs used in the perioperative period were opioid analgesics, especially fentanyl and remifentanyl for surgeries with general anesthesia, and morphine (0.2mg) for spinal anesthesia.

**CONCLUSION:** This study aimed at bringing subsidies on the need for adequate drugs associated to the anesthetic technique to maintain patients in better physiological conditions, with longer painless periods and less adverse effects, thus promoting more adequate quality of life during this critical period.

**Keywords:** Analgesia, Hospitalized patients, Pain, Postoperative pain.

### RESUMO

**JUSTIFICATIVA E OBJETIVOS:** A dor ocorre como uma das principais manifestações nos pacientes em pós-operatório imediato, sendo uma queixa individual e subjetiva que impacta a qualidade de vida dos pacientes. O objetivo deste estudo foi avaliar o uso de analgésicos no pós-operatório imediato de pacientes assistidos em uma sala de recuperação pós-anestésica.

**MÉTODOS:** Os dados foram coletados no período de março a abril de 2016. Trata-se de um estudo transversal, de abordagem quantitativa, realizado na sala de recuperação pós-anestésica de um Hospital de Nível IV do Rio Grande do Sul. Foi utilizado o formulário de caracterização sócio-demográfica e clínica dos pacientes, questionário McGill - forma reduzida.

**RESULTADOS:** Foram entrevistados 336 pacientes, a maioria (68,8%) era do sexo feminino e idosos. O índice de massa corporal para 69,6% foi superior a 25, indicativo de sobrepeso ou obesidade. Duzentos e sessenta e seis pacientes fizeram uso de algum analgésico opioide no perioperatório. Verificou-se a associação estatística entre não apresentar dor no pós-operatório e fazer uso de qualquer opioide. Entre os fármacos a classe mais utilizada durante o perioperatório foi analgésico opioides, destacando-se o uso de fentanil e remifentanil, para cirurgias com anestesia geral, e morfina (0,2mg) para anestésias subaracnóideas.

**CONCLUSÃO:** Este estudo buscou trazer subsídios sobre a necessidade de fármacos adequados associados à técnica anestésica, para que o paciente se mantenha com melhores condições fisiológicas, com mais tempo sem dor e com menos efeitos adversos, proporcionando assim qualidade de vida mais apropriada para esse período crítico.

**Descritores:** Analgesia, Dor, Dor pós-operatória, Pacientes internados.

### INTRODUCTION

Pain is a major manifestation in the immediate postoperative period, is different among individuals and influences patients' quality of life (QL), being considered the most common reason for human distress and incapacity. Pain is a multidimensional experience which involves sensory, affective, autonomic and behavioral aspects<sup>1</sup>.

Moreira et al.<sup>2</sup> have reported that pain is frequent in patients submitted to surgical procedures and in the immediate postoperative period. So, analgesia should start before surgery to favor fast patients' response and early recovery of organic functions, since pain may induce postoperative complications. According to Miranda et al.<sup>3</sup> pain may

1. Universidade Regional do Noroeste do Estado do Rio Grande do Sul, Departamento de Ciências da Vida. Ijuí, RS, Brasil.

Submitted in August 23, 2016.

Accepted for publication in January 26, 2017.

Conflict of interests: none – Sponsoring sources: none.

#### Correspondence to:

Departamento de Ciências da Vida  
Rua do Comércio, 3000 – Bairro Universitário  
98700-000 Ijuí, RS, Brasil.  
E-mail: chriscolet@yahoo.com.br

cause functional and organic damages, which impair the recovery of vital signs, respiratory, thermal and circulatory capacity.

So, the anesthetic technique applied to patients interferes with postoperative pain<sup>4</sup>. According to Vaz & Vaz<sup>5</sup>, analgesia should be adapted according to pain intensity, characteristics and nature, as well as to surgery type and size. In addition, other factors, such as anxiety, socio-cultural origin, psycho-behavioral factors and type of anesthesia might influence analgesia quality.

Barbosa et al.<sup>6</sup> have indicated a technique which is being used and has shown to be effective, which is the multimodal analgesia which, according to the World Health Organization (WHO), is the association of different analgesics, thus favoring the use of lower doses, according to patients' need and profile, thus preventing adverse effects.

The adequate choice of the drug is critical to effectively manage postoperative pain. Non-steroid anti-inflammatory drugs (NSAIDs) and opioid analgesics are the most widely used drugs for postoperative pain<sup>7</sup>.

There are studies which have proved pain evaluation by different methods such as Daminelli, Sakae & Bianchini's<sup>8</sup>, which has evaluated postoperative analgesia effectiveness.

This study aimed at evaluating the use of analgesics in the immediate postoperative period of patients assisted in a post-anesthetic care unit (PACU), according to the type of surgery.

## METHODS

This is a cross-sectional and quantitative study carried out in a PACU of a Level IV Hospital of Rio Grande do Sul from March to April 2016. For sample calculation, the number of monthly surgeries carried out in the hospital the year before the study was used. Monthly mean was 463 surgeries with confidence level of 95% and sample error of 5%. Sample was made up of 302 patients with 10% for sample safety margin. Participated in the study 336 patients in the immediate postoperative period assisted in the PACU.

A form developed for patients' socio-demographic and clinical characterization and brief McGill questionnaire were used<sup>9</sup>. This form encompasses socio-demographic variables: gender, weight (kg), height and age. Clinical and surgical data involve the use of opioids, anesthetic drugs by different routes, muscle relaxant, other opioid and non-opioid analgesics and adverse effects of these drugs.

McGill questionnaire is widely accepted as trustworthy, valid, sensitive and accurate. Pain is evaluated according to present pain intensity (PPI) at patients PACU admission and discharge, being this based on words selected by patients to describe their own pain. Pain numeric scale (PNS) is where patients grade their pain in numeric intervals from zero to 10, being zero (no pain); 1 to 3 (mild pain); 4 to 6 (moderate pain); 7 to 9 (severe pain); and 10 (worst imaginable pain).

Pain was evaluated in two moments, with McGill scale. First evaluated period was at PACU admission, by means of PPI

evaluation, and the second period was at PACU discharge, moment when they were referred to the ward. Questionnaire was applied by previously trained interviewers, during their PACU stay.

Drugs were classified according to the third level of the Anatomical Therapeutic Chemical (ATC)<sup>10</sup>.

This study was approved by the Research Ethics Committee, UNIJUÍ, Opinion 1.426.751 of 02/26/2016.

## Statistical analysis

Analytic statistics, helped by statistical software SPSS version 18.0 were used for data analysis. Opioid analgesics, inhalational anesthetics, intravenous drugs, muscle relaxants and other analgesics were associated to admission PPI and discharge PPI.

ANOVA, followed by Student *t* test, was used for independent samples. PPI was equal zero for patients reporting no pain and higher than zero for patients referring pain of different intensities.

## RESULTS

Participated in the study 336 patients, most (68.8%) females and 75.9% elderly. BMI was calculated and it was observed that 69.6% had score above 25, indicating overweight or obesity. Complete data are shown in table 1.

**Table 1.** Socio-demographic characterization of patients in immediate postoperative period collected from March to April 2016 (n=336)

Characteristics	n	%
Gender		
Male	105	31.3
Female	231	68.8
Age (years)		
≥ 60	255	75.9
< 59	81	24.1
Body mass index		
≥ 25	234	69.6
< 24.9	102	30.4
Total	336	100

Most frequent surgeries were open surgeries (77.6%) with general anesthesia (45.2%), followed by spinal and/or spinal with lumbar block (40.4%). As to surgical specialties, most frequent were oncologic (26.5), traumatic (17.6%), general (15.8%), obstetric (17.3%), urologic, gynecologic and vascular surgeries (9.8%), presented in a previous study with a group of patients followed up in the PACU.

Table 2 shows drugs used during surgery. It was observed that most widely used opioid analgesics was fentanyl (68.1%). Dipirone was used by 69% as analgesic during surgery. With regard to inhalational anesthetics, both isoflurane and sevoflurane were rarely used. With regard to intravenous agents, propofol was used by 69% of patients

and atracurium was used by most patients (34.5%). Thiopental was not used.

**Table 2.** Use of opioid analgesics, anesthetics and muscle relaxants during surgery (n=336)

Drug classes	Yes n (%)	No n (%)
<b>Opioid analgesics</b>		
Alfentanil	52 (15.3)	284 (84.7)
Fentanyl	230 (68.1)	106 (31.9)
Remifentanil	88 (26)	248 (74)
Sufentanil	6 (1.5)	330 (98.5)
Morphine (0.2mg)	121 (36.2)	215 (63.8)
Morphine (10 mg)	37 (11)	299 (89)
Nalbuphine	18 (5.6)	302 (94.4)
<b>Non-opioid analgesics</b>		
Ketoprofen	214 (63.7)	122 (36.3)
Dipirone	232 (69)	104 (31)
<b>Inhalational anesthetics</b>		
Isoflurane	19 (5.7)	317 (94.3)
Sevoflurane	23 (6)	313 (94)
<b>Intravenous anesthetics</b>		
Ketamine	9 (2.7)	327 (97.3)
Propofol	232 (69)	104 (31)
Thiopental	-	336 (100)
<b>Muscle relaxant</b>		
Atracurium	116 (34.5)	220 (65.5)
Pancuronium	-	336 (100)
Rocuronium	45 (13.2)	291 (86.8)
Suxamethion	2 (0.3)	334 (99.7)

Table 3 shows drugs used in the postoperative period in the PACU. It was observed that 8.9% of PACU patients used tramadol as opioid analgesic. With regard to analgesics, it was observed that 26.5% of patients have used dipirone. In some cases, drugs were prescribed in associations, such as tramadol and ketoprofen, dipirone and ketoprofen or even tramadol with dipirone. A total of 42.8% of patients have used some type of analgesic.

**Table 3.** Use of opioid and non-opioid analgesics in the immediate postoperative period of post-anesthetic care unit patients (n=336)

Use	Yes n (%)	No n (%)
<b>Opioid analgesics</b>		
Morphine*	5 (1.5)	331 (98.5)
Tramadol	30 (8.9)	306 (91.1)
<b>Non-opioid analgesics</b>		
Ketoprofen	20 (5.9)	316 (94)
Dipirone	89 (26.5)	247 (73.5)

\*10 mg morphine diluted in sterile distilled water.

Table 4 shows drugs used during surgery and in the PACU, comparing PACU admission and discharge PPI. It was observed that 266 patients have used some opioid analgesic during surgery and from these 144 patients have referred no pain and 122 patients have referred pain>zero. From patients using some opioid during surgery, 135 remained painless until PACU discharge and results were statistically significant at patients admission (p=0.000) and discharge (p=0.000). With regard to fentanyl, it was observed that 122 patients have used it during surgery and had no pain at admission and 115 remained pain-free, being these results statistically significant. When comparing the types of morphine, it was observed that those using intravenous 0.2 mg morphine have referred less pain, being that 90 patients have reported pain zero at admission and 75 have remained painless at PACU discharge, with statistical significance (p=0.000) in both moments. With regard to propofol, 117 patients were admitted with no pain, however during recovery 121 patients have developed pain>zero.

**Table 4.** Comparison of the use of drugs during surgery and in the post-anesthetic care unit and pain intensity at patients' admission and discharge (n=336)

	PPI Admission			PPI Discharge		
	0	> 0	P	0	> 0	P
<b>Opioid<sup>a</sup></b>						
Yes	144	122	.000*	135	131	.001*
No	55	15		43	27	
<b>Alfentanil</b>						
Yes	24	25	.001*	23	30	.030
No	175	112		155	128	
<b>Fentanyl</b>						
Yes	122	106	.000*	115	113	.001*
No	76	32		63	45	
<b>Remifentanil</b>						
Yes	35	52	.000*	35	52	.000*
No	164	87		143	106	
<b>Sufentanil</b>						
Yes	3	2	.969	4	1	.015*
No	196	135		174	157	
<b>Morphine (10 mg)</b>						
Sim	13	21	.000*	10	24	.000*
Não	178	124		162	140	
<b>Morphine (0,2 mg)</b>						
Yes	90	28	.000*	75	43	.000*
No	104	114		100	118	
<b>Isoflurane</b>						
Yes	6	9	.002*	5	11	.002*
No	191	130		0	149	
<b>Sevoflurane</b>						
Yes	7	13	.000*	6	14	.000*
No	190	126		170	146	

Continue...

**Table 4.** Comparison of the use of drugs during surgery and in the post-anesthetic care unit and pain intensity at patients' admission and discharge (n=336) – continuation

	PPI Admission			PPI Discharge		
	0	> 0	P	0	> 0	P
<b>Propofol</b>						
Yes	117	113	.000*	109	121	.005*
No	81	25		68	38	
<b>Atracurium</b>						
Yes	53	62	.000*	48	67	.000*
No	145	77		129	92	
<b>Rocuronium</b>						
Yes	17	27	.000*	19	25	.005*
No	181	114		158	134	
<b>Suxamethion</b>						
Yes	-	1	.015*	-	1	.033
No	198	137		177	158	
<b>Dipirone</b>						
Yes	129	93	#	111	111	.007*
No	61	53		57	57	
<b>Ketoprofen</b>						
Yes	115	84	#	107	92	.252
No	75	62		61	76	
<b>Nalbuphine</b>						
Yes	10	8	#	8	10	.160
No	180	138		160	158	
<b>Ketamine</b>						
Yes	-	2	#	1	1	.926
No	180	154		157	177	

<sup>a</sup>use of any opioid during surgery; \*statistically significant, t test for dependent samples; # test not performed because patient has only used such drugs after post-anesthetic care unit admission; PPI = present pain intensity.

There has been statistical association between no postoperative pain in patients using: any opioid, among them: fentanyl (p=0.001), remifentanyl (p=0.000), sufentanyl (p=0.015), 0.2 mg morphine (p=0.000) and 10 mg morphine (p=0.000). There has been no association between variables and alfentanyl (p=0.030) or muscle relaxant suxamethion (p=0.033) and analgesics such as ketoprofen (p=0.252), nalbuphine (p=0.160) and ketamine (p=0.926). This study has not evaluated pain previous to surgery, being this a limitation.

## DISCUSSION

In our study, most patients were females, aged above 60 years and BMI above 25. Similar data to a study carried out in surgical units between August and September 2006, with patients submitted to general anesthesia, where females (66.8%) and patients aged above 60 years have prevailed<sup>11</sup>. Nora<sup>12</sup> has also reported that gender, age, weight, height and BMI are critically important for the choice of anesthetic type and technique.

Considering the type of surgery, it was observed that patients submitted to oncologic, traumatic and vascular surgeries have reported more pain, with statistically significant difference.

Most widely used class in this study was opioid analgesics, especially fentanyl and remifentanyl for surgeries with general anesthesia, and 0.2 mg morphine for the association with spinal and/or lumbar block anesthesia. Vaz & Vaz<sup>5</sup> have reported that spinal opioids individually applied may promote optimal analgesia and, if combined to local anesthetics, dose decrease cause less adverse effects.

Daminelli, Sakae & Bianchini<sup>8</sup> have evaluated the effectiveness of postoperative analgesia in a hospital of Santa Catarina from July to October 2006 and have reported the predominance of simple analgesics such as dipirone and NSAIDs such as ketoprofen, being superior to the prescription of opioids. These data are similar to our study were dipirone and ketoprofen consumption has predominated.

Palombo & Medeiros<sup>13</sup> have reported that to minimize postoperative pain it would be desirable the prescription of analgesics with fixed time, which could prevent plasma level unbalance of administered drugs, also preventing patients of suffering pain peaks. However, this was not evaluated in our study. Custódio et al.<sup>14</sup> have described that there is not just one way or method to manage pain, because different pain types and intensities may appear in the postoperative period, depending on the type, size and drugs used during surgery.

However, it would be important that hospitals kept a standardization of drugs, anesthetic techniques and therapies, according to the types of surgeries, be them open or closed, because these variations result in different pain intensities due to damage caused during surgery. In these cases, clinical protocols would minimize postoperative pain. The lack of protocols in health institutions for pain control impairs the prescription of analgesics and the classification of patients' pain intensity<sup>15</sup>.

In our study, most reported symptoms by patients as adverse effects were nausea, vomiting and sleepiness, especially in surgeries with general anesthesia or sedation. These adverse effects are in general attributed to opioids, being them the most widely used drugs in surgeries under general anesthesia. According to Vaz & Vaz<sup>5</sup>, opioid-induced nausea and vomiting are related to their central and peripheral action, stimulating chemoreceptor zone and provoking gastric stasis, respectively. Opioids may induce sleepiness and the author also reports that preventive analgesia contributes a lot for a better postoperative period, with less pain intensity and adverse effects. On the other hand, according to some authors, inhalational anesthetics and propofol in the intraoperative period do not seem to influence postoperative pain intensity. There has been just one statistical difference between propofol and desflurane (p=0.04) and remaining comparisons were not significant (p<sup>3</sup>0.07). There have been no statistically significant differences between fentanyl and morphine in two evaluated groups (p=0.21 and 0.24)<sup>16</sup>. In our study, propofol, isoflurane and sevoflurane were statistically different in controlling pain.

This is justified because these are anesthetic drugs more frequently used in our study, the use of which has always been associated to an opioid analgesic.

With regard to fear of professionals to administer opioid analgesics, Nascimento et al.<sup>15</sup> have evaluated difficulties in administering them, reported by a nursing team. In 2008, in a large Teaching Hospital of Paraná, it was observed that 58.4% of professionals have administered the drug when patients referred mild pain, followed by 39% when pain was moderate and 2.6% have started its administration after severe pain report. Among reported difficulties for its administration, 65% of professionals have reported lack of analgesic prescription, 76% fear of dependence and/or withdrawal syndrome, which occurs after abrupt opioid withdrawal.

## CONCLUSION

Our results have shown that analgesics such as tramadol and dipirone were prescribed and the most frequently used to minimize pain reported by patients in the post-anesthetic care unit.

## REFERENCES

1. Silva JA, Ribeiro Filho NP. A dor como um problema psicofísico. *Rev Dor.* 2011;12(2):138-51.
2. Moreira L, Truppel YM, Kozovits FG, Santos VA, Atet V. Analgesia no pós-cirúrgico: panorama do controle da dor. *Rev Dor.* 2013;14(2):106-10.
3. Miranda AF, Silva LF, Caetano JA, Sousa AC, Almeida PC. Avaliação da intensidade da dor e sinais vitais no pós-operatório de cirurgia cardíaca. *Rev Esc Enferm USP.* 2011;45(2):327-33.
4. Santos AC, Braga FS, Braga AF, Souza GA, Moraes SS, Zeferino LC. Efeitos adversos no pós-operatório de cirurgias ginecológicas e mamárias. *Rev Assoc Med Bras.* 2006;52(4):203-7.
5. Vaz JL, Vaz MS. Fisiopatologia da dor pós-operatória. *Educação Médica Continuada do Colégio Brasileiro de Cirurgiões.* 2005;1(2):1-12. Disponível em: [https://cbc.org.br/wp-content/uploads/2013/05/V.1\\_n.2\\_Dor\\_cirurgica\\_Fisiopatologia\\_II.pdf](https://cbc.org.br/wp-content/uploads/2013/05/V.1_n.2_Dor_cirurgica_Fisiopatologia_II.pdf).
6. Barbosa MH, Correa TB, Araujo NF, Silva JAJ, Cardoso RJ, Cunha DF. Dor, alterações fisiológicas e analgesia nos pacientes submetidos a cirurgias de médio porte. *Rev Eletr Enferm.* 2014;16(1):1-9.
7. Bassanezi BS, Oliveira Filho AG. Analgesia pós-operatória. *Rev Col Bras Cir.* 2006;33(2):116-22.
8. Daminelli C, Sakae TM, Bianchini N. Avaliação da efetividade da analgesia pós-operatória em hospital no sul de Santa Catarina de julho a outubro de 2006. *ACM Arq. Catarin.* 2008;37(1):18-24.
9. Melzack R. The short-form McGill pain questionnaire. *Pain.* 1987;30(2):191-7.
10. [http://www.whooc.no/atc\\_ddd\\_index/](http://www.whooc.no/atc_ddd_index/).
11. Couceiro TC, Valença MM, Lima LC, Menezes TC, Raposo MC. Prevalência e influência do sexo, idade e tipo de operação na dor pós-operatória. *Rev Bras Anesthesiol.* 2009;59(3):314-20.
12. Nora FS. Anestesia venosa total em regime de infusão alvo-controlada: uma análise evolutiva. *Rev Bras Anesthesiol.* 2008;58(2):179-92.
13. Palombo PA, Medeiros VC. Controle da dor aguda no pós-operatório imediato. *Rev Enferm Unisa.* 2001;2(1):57-62.
14. Custódio G, Zappellini CE, Trevisol DJ, Trevisol FS. Uso de analgésicos no pós-operatório para tratamento de dor em hospital do Sul do Brasil. *Arq Catarinenses Med.* 2008;27(4):75-9.
15. Nascimento LA, Santos MR, Aroni P, Martins MB, Kreling MC. Manejo da dor e dificuldades relatadas pela equipe de enfermagem na administração de opioides. *Rev Eletr Enferm.* 2013;13(4):714-720. Disponível em: <https://www.fen.ufg.br/revista/v13/n4/pdf/v13n4a16.pdf>.
16. Ortiz J, Chang LC, Tolpin DA, Minard CG, Scott BG, Rivers JM. Estudo randômico controlado que compara os efeitos da anestesia com propofol, isoflurano, desflurano e sevoflurano sobre a dor pós-colecistectomia videolaparoscópica. *Rev Bras Anesthesiol.* 2014;64(3):145-51.