

## CLINICAL SCIENCE

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### THE “OLIGOANALGESIA PROBLEM” IN THE EMERGENCY CARE

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**INTRODUCTION:** Pain is a common occurrence in trauma victims that provokes harmful effects on the body. However, there is a gap in the literature about this problem, which is still underevaluated and undertreated in Brazil, especially concerning the use of opioids.

**OBJECTIVES:** To estimate pain intensity and the use of analgesia in traffic accident victims.

**MATERIALS AND METHODS:** A prospective study, involving 100 accident victims (traffic accidents), who were interviewed at 2 separate posttraumatic moments, in a reference hospital of the city of São Paulo. All the medications used for these victims were recorded. All patients displayed a Glasgow Coma Scale (ECGI) of 15, had stable hemodynamic parameters, and were brought directly from the scene of the accident.

**RESULTS:** Pain of moderate and severe intensity (in 90% of cases) was the most noted. After a 3-hour period, a significant number of patients with pain (48%) continued without analgesia, and few opioids were used.

**CONCLUSION:** Pain is a common event associated with trauma. It is still undertreated and underevaluated in Brazil, and the use of opioids for admittedly very severe pain is not frequently employed in the Emergency Service even in hemodynamically stable patients and with a Glasgow Coma Scale of 15.

**KEY-WORDS:** Pain. Emergency care. Analgesia. Traffic accidents. External causes.

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#### INTRODUCTION

Pain is recognized as one of the main consequences of trauma, with potentially harmful effects on the body.<sup>1</sup> Nevertheless, control of the victim's pain is given little attention.<sup>2</sup>

Pain is a disagreeable emotional and sensory experience, associated with real or potential tissue injury and described in terms of this damage.<sup>3</sup> Acute pain is a warning that something is wrong and is related to traumas, burns, infections, and inflammatory processes.<sup>2</sup>

Acute pain initiates with an injury, and algogenic sub-

stances are synthesized or liberated at the site, stimulating nerve endings (nociceptors) of thin myelinated or amyelinic fibers. The impulse is transmitted by these nociceptive fibers to the posterior horn of the medulla, or in the case of cranial nerves, to the sensitive nuclei. At these sites, modulation can occur (amplification or suppression) of the signal, before being projected to the specific areas of the cerebral trunk, thalamus, hypothalamus, and cerebral cortex, where it is interpreted. Reflexes that involve neuroendocrine changes originate along these pain-conducting paths.<sup>4</sup>

The persistence of these responses is a function of the permanence of acute pain, resulting in the formation of a vicious cycle, with progressive increase of organic dysfunction and injurious effects on the traumatized patient, such as hypoventilation, increase in cardiac work load, reduction in peripheral blood perfusion, and reflexive muscle contraction.<sup>5</sup>

Within the emergency care setting, somatic problems take priority over the control of acute pain.<sup>6</sup> It is common

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that analgesia is insufficient, with the assumption that postoperatively it will be taken care of by the anesthetists.

The appropriate management of anxiety and pain is an important component of comprehensive emergency medical care for patients of all ages. Pain control often is not adequately provided for a variety of reasons, which include fear of oversedation, concern regarding altering physical findings, or underestimation of patients needs. However, proactively addressing pain and anxiety may improve quality of care and patient satisfaction by facilitating interventional procedures and minimizing patient suffering. In fact, studies have shown that as many as 70% of patients with acute painful conditions do not receive any pain medications in the emergency care setting.<sup>2,3</sup>

External causes, the result of accidents or violence, constitute most of the emergency assistance.<sup>7</sup> External causes are a global public health problem, being responsible for a significant part of existing morbidity, mortality, and disability, in addition to a substantial socioeconomic cost. In Brazil, external causes are the third largest source of general death, disregarding unexplained causes.<sup>7</sup>

Among the types of acute pain, the one in the emergency room (ER) is the least investigated type in Brazil, a situation identified after an extensive survey of the literature. This situation is interesting and troubling in view of the large number of victims who are assisted daily and remain in this sector. In addition, in the textbooks on the subject of assistance to trauma victims, there is no chapter addressing this subject. It is an area in which many aspects need to be studied.

## OBJECTIVES

The objectives were to characterize pain intensity and use of analgesics in traffic accident victims and to improve assistance to victims of external causes regarding evaluation and pain relief in the ER.

## MATERIALS AND METHODS

This was a prospective descriptive study performed using documents (case records) and field research (interviews). It was developed in the surgical ER of a general government hospital, a reference center for trauma assistance in the city of São Paulo. Collection of data was initiated after approval by the Research and Ethics Committee of the hospital.

One hundred traffic accident victims admitted to the ER in the months of March and May of 2004 were analyzed. When the investigator was in the field, the analysis was initiated immediately after first aid. When the investigator

was not in the field, she was called and appeared at the scene. Evaluation of the patients included physical examination and interviews that will be described. One hundred victims were analyzed who met the following inclusion criteria: had proceeded directly from the scene of the accident to the ER, had a Glasgow Coma Scale score equal to or above 15 (ECGI e" 15), had stable hemodynamic parameters, and were 16 years of age or older. The patients were attested to be conscious and oriented, since this was fundamental for the precision of pain assessment. Additionally, the age limit equal to or above 16 years was chosen because of family intervention perceived with victims of younger ages as observed in pretest stages.

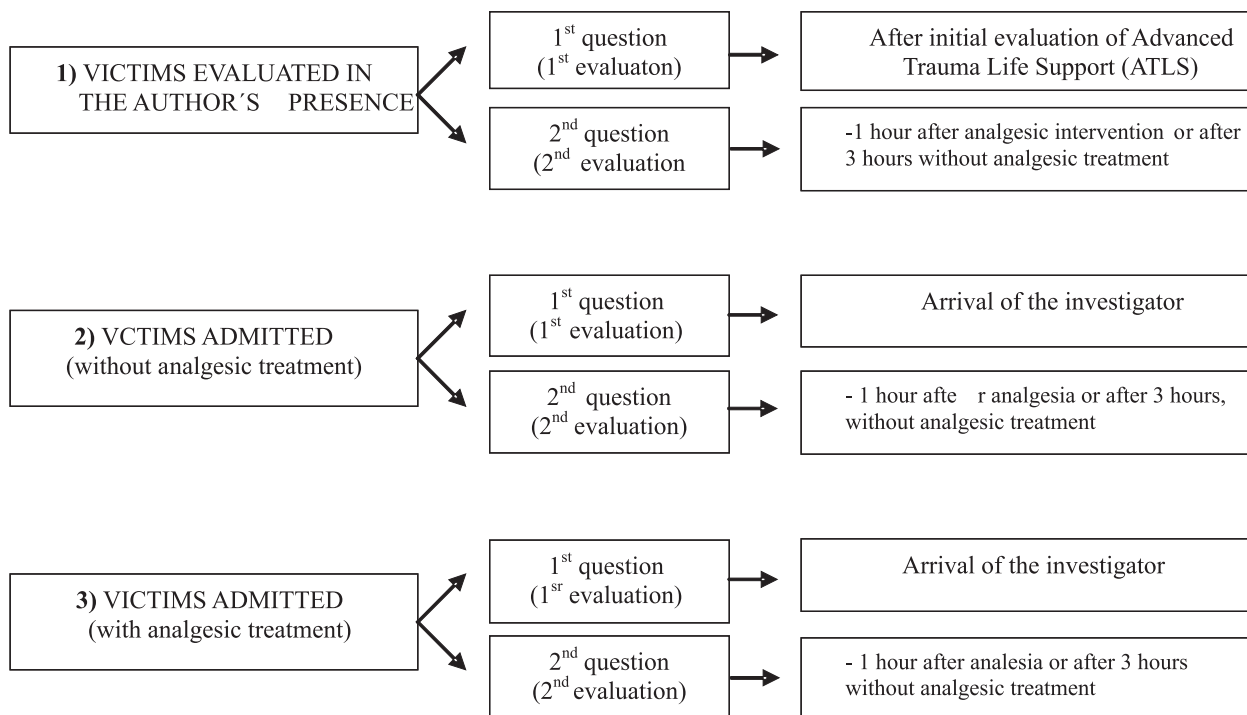
The source data included the registry book of hospital admissions, record of admission to the emergency room (PSC), the patient's chart, physical examination, and interview. Using the registry book, the investigator located the patients in the ER and invited them to participate in the study after signing the Post-Informed Term of Consent; the same was done with those responsible for minors.

A card file was made out for each patient with the objective of characterizing the pain and analgesic pattern. It was decided that the physical examination and interview would be performed after the primary analysis and secondary to stabilization of the clinical picture.

The physical examination included checking hemodynamic parameters and evaluation of corporal segments and level of consciousness using the Glasgow Coma Scale (ECGI). The interview included important aspects of evaluation (clinical history), recommended for evaluation of patients with acute pain, that include presence or absence of pain, location and intensity of pain, initiation of the algesia, duration of pain, and aggravating and attenuating factors.

The instrument was filled out using the patient's answers, physical examination, and reading of the patient's admission card and/or chart. The investigator read the questions in a loud voice, and the patient answered them verbally; in case of doubt the question was repeated. Regarding the numerical scale and the corporal diagram, the patient pointed to or verbally mentioned his or her opinion on the choice, and the author marked the spots indicated at the 2 moments of the interview referring to the presence of pain and its intensity. The numerical scale and corporal diagram were enlarged on separate sheets for better visualization and application of the instrument.

A fundamental aspect of the interview referred to the moment of the 2 indications of pain intensity on the numerical scale. The first indication referred to the first question of the clinical history (feeling of pain at the moment), that was termed the first evaluation, and the second indi-



cation, termed the second evaluation, referring to the same question about pain (feeling of pain at the moment) applied according to the following diagram:

The same procedure was adopted for the victims receiving analgesic treatment.

Pain intensity was evaluated using the numerical scale at 2 moments and the location of the stronger pain as indicated on the corporal diagram. Pain intensity was classified as follows: 0, absence of pain; 1-4, mild pain; 5-7, moderate pain; and 8-10, severe pain.

A period of 1 hour postmedication was chosen as a safety standard to begin and the average time of medication action. Three hours was established as the maximum waiting period for installation of analgesic therapy and for viability of the study.

The analgesic medications used were determined from the patient's chart, and all of them could be confirmed by checking the administration's chart and the pharmaceutical control of dispensing the medications, with special care given for opioids and other psychotropic drugs.

The analgesic prescriptions were divided into 4 groups: analgesics (exclusively); nonhormone anti-inflammatory (AINH exclusively); weak opioids (tramadol and codeine), and strong opioids (morphine and meperidine). The opioids were analyzed together in the results.

The data were typed into a database for processing for descriptive analyses and for inferences and statistical tests. The latter were performed to confirm the association between the variables and the homogeneity between the ra-

tios and to assess the existence of a relationship between the ratios at 2 separate moments of evaluation. A *P* value of < .05 was declared statistically significant for all tests.

The analysis of the quantitative variables was performed by observation of the minimum and maximum values and calculation of the means and standard deviations. The qualitative variables were calculated using the absolute and percentage frequencies. The statistical tests used were the chi-square test, to verify the association between the variables studied and the homogeneity between the ratios;<sup>8</sup> the Fisher exact test, to evaluate the association between the variables and comparison of ratios when the answers presented expected frequencies of less than 5;<sup>8</sup> the Mann-Whitney parametric test, to confirm the comparison of 2 independent groups compared with a quantitative variable that did not display a normal distribution (assumption of normality of the rejected data);<sup>8</sup> the McNemar test, to evaluate the existence of a relationship between the ratios, in 2 separate moments of evaluation; and the Student *t* test, to verify the existence of differences in means in the qualitative and quantitative variables of different groups.<sup>8</sup>

The patient was excluded from the study if there was a drop in consciousness and/or alteration in hemodynamic parameters.

**RESULTS**

Pain intensity at the 2 moments of the evaluation are presented in Table 1.

**Table 1** - Distribution of patients (n = 100) based on pain intensity, in two moments, São Paulo, 2003.

	First Evaluation		Second Evaluation	
	n°	%	n°	%
Absence of pain	10	10.0	17	17.0
Mild pain	5	5.0	19	19.0
Moderate pain	29	29.0	38	38.0
Severe pain	56	56.0	26	26.0
Total	100	100	100	100

Notice in Table 1, that at the first evaluation, 56.0% of patients presented severe pain and 29.0% moderate pain, at the second evaluation, 26.0% mentioned severe pain and 38.0% moderate pain, and only 7.0% obtained complete relief from their pain.

Statistical tests for comparison of evaluation of the levels of pain (the 4 mentioned in Table 1) could not be performed. The statistical possibility of comparison by means of 2 groups was indicated as follows: **without pain + mild pain and moderate pain + severe pain**. For each victim, a point system of his pain path (termed progression of his pain) was charted at the first and second evaluations. The results of this analysis are displayed in Table 2.

Table 2 demonstrates that from the first to the second moments of pain evaluation, the number of patients free of pain or with slight pain increased significantly, and a significant decrease occurred for those with moderate or severe pain.

**Table 3** - Distribution of patients (n = 100) based on analgesic medication received during initial assistance and pain intensity. São Paulo, 2004

Analgesic	No pain		1 - 4		5 - 7		8 - 10		Total	
	n°	%	n°	%	n°	%	n°	%	n°	%
None	10	100	5	100	22	75.9	38	67.8	75	75.0
Simple analgesic	-	-	-	-	6	20.7	4	7.2	10	10.0
AINH*	-	-	-	-	-	-	3	5.4	3	3.0
Opioid	-	-	-	-	1	3.4	11	19.6	12	12.0
Total	10	100	5	100	29	100	56	100	100	100

\*Anti-inflammatory non-hormonal (AINH)

**Table 4** - Distribution of patients (n = 100) based on medication received during the observation period and intensity of pain. São Paulo, 2004.

Analgesic	No pain		1 - 4		5 - 7		8 - 10		Total	
	n°	%	n°	%	N°	%	n°	%	n°	%
None	10	100	4	75.0	21	72.4	30	53.6	65	65.0
Simple analgesic	-	-	1	25.0	6	20.7	9	16.1	16	16.0
AINH*	-	-	-	-	-	-	3	5.3	3	3.0
Opioid	-	-	-	-	2	6.9	14	25.0	16	16.0
Total	10	100	5	100	29	100	56	100	100	100

\*anti-inflammatory non-hormonal

**Table 2** - Patient distribution (n = 100) based on progress of pain intensity at two moments, divided into two groups (without pain + mild pain) and (moderate pain + severe pain). São Paulo, 2004.

Moment	Without pain + Mild pain		Moderate pain+ Severe pain		Total	
	n°	%	n°	%	n°	%
1° evaluation	15	15.0	85	85.0	100	100
2° evaluation	36	36.0	64	64.0	100	100

p = 0.001

Table 3 displays that of the 75 patients who did not receive pain medication in the ER, 38 suffered severe pain and 22 moderate pain (5-7 on a scale of 10). Of the 56 patients suffering severe pain, 11 were given opioids, and of the 29 with moderate pain, only 1 received opioid treatment.

Table 4 shows that of the total of 65 patients who did not receive any medication during the observation period, 30 suffered severe pain and 21 moderate pain. Of the 56 patients who had severe pain, 14 received opioids during the entire observation period.

## DISCUSSION

In concert with the literature, the population involved in these accidents was under 40 years of age and had a higher frequency of males (74%).<sup>9</sup>

There are numerous studies that report that pain in an emergency situation, especially in trauma, is underevaluated and undertreated, leading to the term "oligoanalgesia."

Note, that only 7.0% of the patients obtained complete relief from their pain, since at the first evaluation, 10 victims stated they did not feel pain and at the second, 17 victims felt no pain. The 10 victims who denied feeling pain at the first evaluation confirmed its absence at the second evaluation.

The results point to 3 important aspects regarding our population of patients as follows: the confirmation that pain is an event that accompanies trauma, the extent of the severity of pain felt by the patients, and the oligoanalgesia in the ER.

The effect of the strength of the pain and the anxiety on the humoral response is characterized by an increase in the levels of circulating catabolizing hormones, such as catecholamines, glucagon, and cortisol. This increase, which can attain 400% compared with the basal level, is irregular, with variable hemodynamic consequences.<sup>10</sup> The metabolic effects of the humoral response to stress include increase in oxygen consumption, glycogenolysis, glyconeogenesis, and lipolysis. The body's response to trauma causes a syndrome of general adaptation or response to stress that can be broadened by various other factors, including pain, anxiety, fear, hypothermia and hyperthermia, hypovolemia, acidosis, fasting, dehydration, hypoxia, infection, sepsis, prolonged immobilization, and discomfort.<sup>10</sup>

A common question in textbooks about the subject of pain and analgesia in emergency care, shared by the authors, refers to the real dimension of the collateral effects on the progress of the patient with traumatic injuries while in pain.<sup>11</sup>

From Table 2 we note the improvement in pain intensity between 2 moments; nevertheless, many patients still continued with pain. We must emphasize that in cases of improvement of analgesia, the analgesic treatment consisted of opioids and nonhormonal anti-inflammatory agents.

According to the American College of Surgeons,<sup>12</sup> improving tissue perfusion, minimizing cell injury and the physiological changes related with hypoxia, controlling the bleeding, maintaining stable life functions, and maintaining the stability of the spinal column are priorities in the care of trauma victims. Therefore, it seems clear that adequate evaluation, control, and relief of pain, besides its humanitarian aspect, should constitute a vital part of immediate assistance to trauma victims, with the objective of attempting to maintain basic physiological functions and avoiding the already mentioned harmful side effects produced by the permanence of pain.<sup>1</sup> Analgesia is a central

practice, expected and fundamental for the physician specializing in emergency medicine. Additionally, emergency procedures require professionals with knowledge, understanding, and experience with the analgesics to be used and the ability to monitor the patient and the responses to medication.<sup>11</sup>

The data from Table 3 demonstrates that three-quarters of the patients did not receive pain-relief medication even though most of them were suffering moderate or severe pain. In the initial evaluation, we noted that a significant number of patients with severe and moderate pain did not receive analgesics. Regarding the entire period of observation (Table 4), we verified that 65 patients without analgesia remained with moderate to severe pain. In the present study, opioids analgesics were administered to only 12 patients during or soon after the initial assistance and to 16 patients during the observation period (Tables 3 and 4). Additionally, no patient was given more than 2 analgesics during the stipulated observation period (3 hours).

Studies point out that the low and variable use of opioid analgesics in the ER are a principal cause of duration of moderate-to-severe intensity of pain in trauma victims and in acute pain in general.<sup>1,6,13</sup> A retrospective study in the ER of 198 patients suffering pain indicated that 56% did not receive medication. Of the 44% of patients who received some drug, 69% of the time it was after more than an hour's wait, and 31% of the time it was after more than a 2-hour wait in the ER.<sup>14</sup> Lewis et al<sup>6</sup> analyzed 400 patients admitted for treatment of fractures in the ER. They noted that only 121 (30%) received some type of analgesia during the period they remained in the ER, affirming that "oligoanalgesia" as a common problem in emergency situations.

Experts in analgesia emphatically affirm that oligoanalgesia and undertreatment of pain lead to inadequate analgesia for the pain mentioned by the patient and that radical changes in attitude are necessary in regard to the use of opioid analgesics by health teams.<sup>15,16</sup> In our study, among the 100 patients interviewed at the initial evaluation, 90 (90.0%) mentioned suffering pain (Table 1), and 75 did not receive any type of pain relief medication (Table 3). Among the 25 who received some pain reliever, 10 were given simple analgesics (dipyrone and acetaminophen), 3 patients were medicated with AINH, and 12 received opioids (Table 3). The undertreatment of pain is obvious, considering that moderate-to-severe pain was mentioned by most of the patients at the first evaluation (Table 1), and since for this intensity of pain, weak and strong opioids are indicated.

Emergency physicians are trained in resuscitation and stabilization of critically ill patients, as well as in all as-



pects of patient management including airway assessment and interventions including rapid sequence intubation. The emergency department is a unique environment where a variety of patients with emergent and urgent conditions are managed; many of these conditions result in significant pain and are associated with varying degrees of anxiety, making the management of analgesia a primary concern for the emergency physician. Many of the procedures performed by emergency physicians are time sensitive, such as the reduction of an extremity dislocation associated with, or at risk for, neurovascular compromise, and are facilitated by a cooperative patient, thus making it necessary for the emergency physician to be facile in the use of procedural analgesia.<sup>10</sup>

Patients with underlying cardiopulmonary disorders, multiple traumas, head trauma, or who have ingested a central nervous system depressant such as alcohol are at increased risk of complications from procedural sedation and analgesia and require a high level of vigilance; to minimize complications, the appropriate drugs and dosages must be chosen, and patient evaluation should be performed before, during, and after their use. This is an important role of a physicians and nurses in the emergency care setting.<sup>10</sup>

The ignorance of pharmacological treatment, the lack of specific and comprehensive education in the area of pain in graduate and postgraduate teaching for health professionals, and the fear of medication are alleged to be the main obstacles for proper evaluation and relief of pain.<sup>17,18</sup>

This analysis has confirmed that pain in the ER is a real

problem of undefined but significant dimensions. We hope that with the presentation of this data, analgesia in trauma is seen as an urgent and important problem to be investigated in our country.

## CONCLUSION

Regarding acute pain, it is confirmed that this is a common occurrence in the ER in traffic accident victims for a vast majority of cases. As for intensity of pain, 56.0% of patients in our study suffered severe pain and 29.0% suffered moderate pain at the first evaluation, and after the proposed observation period, 38.0% of the patients continued to experience moderate pain and 26.0% severe pain, confirming the problem of oligoanalgesia in the ER.

Concerning the use of analgesia, we verified that after 3 hours of observation, most patients remained without pain relief and that the use of opioids was still highly restricted, even in the presence of moderate and severe pain. This situation, reported in other countries as well, needs to be altered in our country, especially in teaching hospitals, which have the conveyance of knowledge and teaching of quality care as their main priorities.

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## RESUMO

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Calil AM, Pimenta CAM, Birolini D. O "problema oligoanalgesia" no cuidado da emergência. Clinics. 2007; 62(5):591-8.

**INTRODUÇÃO:** A dor é um evento comum em vítimas de trauma com efeitos nocivos ao organismo, no entanto, há uma lacuna na literatura sobre essa problemática ainda sub-avaliada e sub-tratada em nosso meio, sobretudo na utilização de opióides.

**OBJETIVOS:** Aferir a intensidade dolorosa e o uso da analgesia em vítimas de acidentes de transportes.

**MATERIAL E MÉTODO:** Estudo prospectivo, envolvendo 100 vítimas de causas externas (acidentes de transporte), que foram entrevistadas em dois momentos distintos pós-trauma em um hospital de referência no Município de São Paulo.. Foram anotadas todas as medicações em uso para essas vítimas. Todos os pacientes tinham Escala de Coma de Gasglow (ECGI) = 15, parâmetros hemodinâ-

micos estáveis e vindos diretamente da cena do evento.

**RESULTADOS:** A dor foi um fenômeno presente em 90% dos casos, sendo as dores de intensidade moderada e forte as mais encontradas. Após um período de três horas, uma significativa parte da população(48%) permanecia sem analgesia, mesmo na vigência de dor e o uso de opióides foi baixo.

**CONCLUSÃO:** A dor é um fenômeno comum associada

ao trauma com sub-tratamento e sub-avaliação em nosso meio e o uso de opióides para dores reconhecidamente muito intensas ainda é um recurso pouco utilizado no Serviço de Emergência, mesmo em pacientes hemodinamicamente estáveis e com Escala de Coma de Gasglow = 15.

**UNITERMOS:** Dor. Emergência. Analgesia. Acidente de transporte. Causas externas.

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