REVISTA BRASILEIRA DE REUMATOLOGIA

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SOCIEDADE BRASILEIRA DE REUMATOLOGIA

Original article

Study of self-medication for musculoskeletal pain among nursing and medicine students at Pontifícia Universidade Católica - São Paulo

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ARTICLE INFO

Article history:
Received 26 July 2012
Accepted 26 August 2013

Keywords:
Pain
Analgesics
Self-medication

ABSTRACT

Objective: To study the self-medication for pain among students of medicine and nursing of the PUCSP compared with students from other knowledge areas.
Material and methods: Data were obtained in two groups: A - students from the health knowledge area, and B - students of law and engineering. It was used a questionnaire developed by the authors. Statistical analysis used the Chi-square test and the Fischer.
Results: In relation to gender, there is a predominance of women in the health group and a male majority in other one. In the health group there was a greater number of medical students, and in the control group of engineering. It is observed a high degree of self-treatment in both groups. It appears that participants in the health group have used more anti-inflammatory drugs and opioid than the others subjects studied.
Conclusion: The frequency of medication for pain is higher in the group of health students, and self-medication is equally practiced among students of health and other areas.

Estudo da automedicação para dor musculoesquelética entre estudantes dos cursos de enfermagem e medicina da Pontifícia Universidade Católica - São Paulo

Palavras-chave:
Dor
Analgésicos
Automedicação

RESUMO

Objetivo: Estudar a automedicação para dor entre estudantes de cursos de medicina e enfermagem da PUCSP em comparação com estudantes das outras áreas de conhecimento.
Material e métodos: Esses dados foram obtidos em dois grupos: A – estudantes da área da saúde e B – estudantes da área de ciências humanas e exatas. Utilizou-se um questionário elaborado pelos autores. A análise estatística usou o teste do qui-quadrado e de Fischer.
Resultados: Na área de saúde há um predomínio do gênero feminino, e nas outras áreas um predomínio masculino. Na área de saúde a maior parte dos estudantes cursa medicina, e

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0482-5004/$ - see front matter.
http://dx.doi.org/10.1016/j.rbre.2014.03.002

nas outras áreas engenharia. Observa-se um alto índice de automedicação em ambos os grupos, constatando-se que os participantes do grupo da área de saúde usam significativamente mais opioides e anti-inflamatórios que os demais estudados.

Conclusão: A frequência do uso de medicamentos para dor é maior no grupo de estudantes da área de saúde, e a automedicação é praticada igualmente entre estudantes da área de saúde e das demais áreas.

Introduction

Pain is defined as "a sensory and emotional experience associated with existing or potential tissue damage, reported as if the injury already existed." Pain is classified as acute or chronic. The occurrence of acute pain indicates injury and exhibits a physiological factor of defense. On the other hand, chronic pain in general has no physiological value and corresponds to an adaptation mechanism.[1-4] Moreover, Woolf[5] divides pain in adaptive pain, associated with the protection of the body and with promotion of wound healing (nociceptive and/or inflammatory origin), and maladaptive pain, which is related to pathological CNS activity (neuropathic and/or functional origin).

Pain should be treated with analgesics and non-pharmacological measures. Among these, we emphasize healthcare education, exercise, and physical medicine. According to Teixeira,[4] physical medicine provides comfort, cures physical dysfunctions, normalizes physiological dysfunctions and reduces the fear associated with the mobilization or immobilization of body parts. The modalities used in physical medicine are acupuncture, thermotherapy, massotherapy, mobilization, electroanalgesia and psicoprophylaxis (meditation, hypnosis, relaxation, etc.).[3,4,6]

Pharmacological therapy is aimed at treating short-term pain, enabling the individual to achieve mobility.[3,4] Analgesia obtained through drugs does not eliminate the cause of pain, but its proper use may lead to an improved quality of life since it facilitates the treatment of the causal factor, and possibly prevents the acute to chronic pain progression.[4] The drugs used include analgesics, nonsteroidal anti-inflammatory drugs (NSAIDs), opioids and possibly antidepressants and anticonvulsants as adjuvants.[3-5,7-10] The indiscriminate use of these drugs should be avoided, because of its adverse effects. One of the central aspects regarding the appropriate use of drugs involves self-medication. Arrais et al.[11] refer to self-medication as a procedure characterized by the initiative of a patient, or of his (hers) parents, to obtain or produc,e and use a product which, he (she) believes, will benefit the treatment of diseases or for relieving the symptoms.[12] Another term used, according to Bestane et al.,[13] is "oriented self-medication", which refers to the reuse of old prescriptions not intended for continuous use.

Theoretically, healthcare professionals and students know the medications and their risks, so they should avoid self-medication. The aim of this study was to evaluate the proper use of pain medication for pain management by healthcare students, compared to students from other knowledge areas.

Material and methods

1) Patients: 247 medicine and nursing students at the Pontifícia Universidade Católica de São Paulo (PUC-SP) were studied.
2) A control group of 252 law and engineering students was also studied.
3) Study Design: A cross-sectional descriptive cohort study.
4) Elaboration and application of a questionnaire containing the following variables: demographic data, student data, number of analgesics used in the last year, presence or absence of medical indication, incidence in both groups of drugs', with and without prescription, adverse effects.
5) Statistical analysis: chi-square or Fisher's exact test were applied (Siegel, 2006), aiming to compare groups A and B in relation to percentage of use, prescriptions obtained, appearance of adverse effects and type of drug used. The level of significance was $p < 0.05\%$, or 5%.[18]
6) Ethical aspects: This project and the obtained informed consent were approved by the Ethics in Research Committee of Faculdade de Ciências Médicas e da Saúde, PUC-SP.

Results

Table 1 shows the distribution of subjects according to gender, age and area of knowledge. Regarding gender, in group A (healthcare subjects) there is a predominance of females; in group B there is a male predominance. In group A, most students pertained to medicine area; in group B, there was a predominance of subjects in the engineering field.

Table 2 shows the frequency and percentage of analgesics used in the last year. More individuals in group A used analgesics, compared to group B.

Table 3 shows the origin of the pharmacological indication, with or without prescription. A high rate of self-medication in both groups was observed, without statistically significant difference.

Table 4 shows the frequency of reported adverse effects after the use of analgesics in both groups. There is a low incidence of adverse effects in both groups, without a statistically significant difference.

Table 5 shows the distribution of analgesics use in relation to pharmaceutical specialties. In group A, analgesics (45.5%) and anti-inflammatory drugs (55.3%) intake was significantly higher than opioids (4.4%), and antidepressants (4.0%) consumption. In group B (control), the chi-square test showed that analgesic consumption (43.2%) was significantly higher than all other drugs. This test also revealed that anti-inflam-

matory drugs (23.0%) were more used than opioids (1.6%) and antidepressants (2.8%). Comparing the two groups, the statistical analysis showed that the use of anti-inflammatory drugs in group A (55.3%) was significantly higher than the control group (23%). As well as with opioids, the results were not significant, but suggest greater use in group A (4.4%). In relation to analgesics and antidepressant drugs, no significant difference between the two groups was observed.

Discussion

Self-medication can induce harmful consequences, regardless of disease, symptom or medication used. In the case of pain, this is even truer. The need for quick relief and the negative impact that pain causes in quality of life imply that the rate of self-medication in this area is quite notorious.

Analgesics and NSAIDs have a similar mechanism of action; both are cyclooxygenase (COX) inhibitors. These enzymes are classified into: (1) COX-1, a constitutional enzyme expressed in most tissues including circulating platelets and is involved in tissue homeostasis; and (2) COX-2, induced by activated inflammatory cells (IL-1 and TNF-α-mediators), is responsible for the production of prostanoid mediators of inflammation, and it is also a CNS constitutive enzyme.[7,9,10] Recently the existence of COX-3 was described, but its actions are not yet fully understood.[7,9] Analgesics exert their function mainly by inhibiting COX-2 by reducing the production of prostaglandins, bradykinins and serotonin, which are the main nociceptor stimulants, thus leading to analgesia.[7,9]

NSAIDs, however, have analgesic, antipyretic and anti-inflammatory effects.[7,9] The analgesic effect is similar to that quoted as the mechanism of action of analgesic drugs.[7,9] The antipyretic effect is result of COX-2 inhibition in the central nervous system, which prevents the set point rise of the hypothalamic thermostat.[7,9] Finally, the anti-inflammatory effect occurs by COX inhibition which interrupts the production and activation process of inflammatory mediators.[5,7,9,10]

Both analgesics and NSAIDs have similar adverse effects, due to their mechanisms of action. For NSAIDs, these effects involve gastrointestinal disorders (dyspepsia, diarrhea, nausea, vomiting, gastric ulceration and bleeding),[7,9,10] allergic skin reactions[7,9] and renal effects,[7,9] (chronic nephritis, papillary necrosis, and acute reversible renal insufficiency).

Table 1 – Demographics and area of activity data.

Variable	Healthcare area	Other areas	Total
Age m (SD)	22.35 (5.56)	22.08 (9.94)	22.09 (9.94)
Gender n (%)			
Male	110 (42.6)	148 (57.4)	258 (100)
Female	137 (56.8)	104 (43.2)	241 (100)
Student area n (%)			
Medicine	185 (74.9)		185 (37.1)
Nursing course	62 (25.1)		62 (12.4)
Law		121 (48.1)	121 (24.2)
Engineering		131 (51.9)	131 (26.3)
Total	247 (100)	252 (100)	499 (100)

Table 2 – Frequency of use of pain medication in the last year.

Groups	Used n (%)	Not used n (%)	Total n (%)
Health	157 (63.8)	90 (36.2)	247 (100)
Other areas	119 (47.2)	133 (52.8)	252 (100)
Total	276	223	498

$p < 0.0001$.

Table 3 – Indication obtained by medical appointment, or not.

Prescription	Yes n (%)	No n (%)	Total n (%)
Healthcare	63 (40.1)	94 (59.9)	157 (100)
Other areas	46 (38.6)	73 (61.4)	119 (100)
Total	109	155	264

$p < 0.05$ or no significant.

Table 4 – Frequency of adverse effects.

Prescription	Yes n (%)	No n (%)	Total n (%)
Healthcare	25 (17.2)	120 (82.8)	145 (100)
Other areas	15 (12.6)	104 (87.4)	119 (100)
Total	40	224	264

$p < 0.05$ or no significant.

Table 5 – Distribution of drugs used according to pharmaceutical class.

Groups	Healthcare			Other			p
	Yes	No	% Yes	Yes	No	% Yes	
Simple analgesics	113	135	45.56	109	143	43.2	> 0.05
Anti-inflammatory agents	145	117	55.34	58	194	23.0	< 0.01
Opioids	11	237	4.4	4	248	1.6	> 0.05
Antidepressives	10	238	4.0	7	245	2.8	> 0.05
Total	279	727	38.37	178	830	17.7	

Observations:
Group A (healthcare) has 157 participants who used drugs.
Group B (other areas) has 119 participants who used drugs.
A participant may have used more than one drug.

Drugs characterized as opioids are used as analgesic, antitussive and antidiarrheal agents.[7,9] The opioid receptors are: μ (mu), κ (kappa) and δ (delta).[7,9] Each of these receptors is involved with specific effects of opioids, and the μ and δ receptors have similar actions in the same regions.[7,9] The analgesia is produced at central level through interaction with opioid receptors present in the CNS, because these have the ability to directly inhibit the ascending transmission of nociceptive information coming from the dorsal horn of the spinal cord, and also have the ability to activate pain inhibitory descending pathways.[5,7,9] The interaction of receptors with their agonists leads to a reduction of cyclic-AMP (cAMP) within neurons, inhibiting the opening of calcium channels in the presynaptic neuron, thereby inhibiting the release of neurotransmitters.[5,7,9] Moreover, the decrease of intracellular cAMP stimulates the opening of potassium channels in the postsynaptic neuron, causing a hyperpolarization that prevents the passage of nerve impulses by the ascending nociceptive pathway; thus, analgesia is produced.[5,7,9] Furthermore, the μ/δ receptors produce analgesia within the descending circuits of pain control partly by removing the inhibition mediated by gamma-aminobutyric acid (GABA) neurons that project to the rostral ventromedial (RVM) part of medulla in the gray periaqueductal (PA) substance, as well as of neurons projecting from the RVM to the spinal cord.[7] The modulatory effects of pain by κ agonists in the brain stem seem to antagonize the effects of μ receptor agonists.[7,9] Opioid drugs can produce many adverse effects such as sedation, euphoria, dysphoria, constipation, nausea, vomiting, pruritus, dizziness and respiratory depression, along with causing tolerance and dependence.[7,9]

Antidepressant agents can be used as adjuvant medication in the treatment of pain.[3,4,7-9] The classes of antidepressant agents used are: monoamine oxidase inhibitors (MAOIs), tricyclic antidepressants (TCAs) and selective serotonin re-uptake inhibitors (SSRIs).[7,9] MAOIs inhibit the action of the enzyme monoamine oxidase (MAO), which is responsible for the degradation of monoamines (dopamine, norepinephrine and serotonin, for instance), thereby maintaining a high concentration of monoamines of inhibitory pain pathways in the synaptic cleft.[7,9] TCAs and SSRIs decrease the neurotransmitter re-uptake in inhibitory pain pathways at the synaptic clefts, thus increasing the concentration of these peptides in the synapses and thereby increasing the stimulus in the postsynaptic neuron.[7,9] Antidepressants increase the efferent pathway of pain inhibition, producing analgesia.[7,9] Furthermore, TCAs are weak agonists of μ opioid receptors, helping to obtain an analgesic effect.[9] Antidepressants can cause several adverse effects such as sedation, anticholinergic effects (dry mouth, constipation, blurred vision, urinary retention, etc.), postural hypotension, convulsions, impotence, weight gain, liver damage (rare), nausea and agitation.[7-9] The analgesic effect of TCAs is well documented; however, the analgesia produced by the use of MAOIs and SSRIs needs further studies.[8]

The degree of knowledge on this topic can generate an awareness of the risk of self-medication but, on the other hand, can cause a false sense of security in the use of these drugs, since access to such information is more expressive. Although healthcare students have greater knowledge, it is known that even experienced professionals are cautious about the use and prescription of these medications.

Among lay population, Pereira et al.[14] reported that 51% of drugs were indicated by mothers and 7.8% by fathers; 20.1% by pharmacy employees, 15.3% resulted from the use of old prescriptions for the child or other family member, and 1.8% by media influence. According to the article "Prevalence and factors associated with self-medication: results from the Bamburgh project",[15] the 16 non-prescription drugs more commonly consumed by self-medication were analgesics/antipyretics (47.6%), followed by drugs acting on the digestive tract, that is, antispasmodics, antidiarrheals, and antacids (8.5%); antibiotics or chemotherapeutic agents (6.2%) and vitamins, tonics or anti-anemic drugs (4.7%).

On the other hand, among healthcare professionals, Hem et al.,[16] in a cohort composed by young Norwegian doctors, found a prevalence of 54% between the fourth and fifth year after graduation; and among those who used drugs in the year prior to the interview, 90% were self-prescriptions. Now Tomasi et al.[17] in their cross-sectional study found that 47% of healthcare workers reported drug using in the last 15 days, especially analgesics (27%), regardless of having, or not, a health problem. Moreover, these authors observed that self-medication was common practice since one fourth of the respondents stated that most drugs used had no prescription. Also in this work, 43% of physicians reported self-medication.

In our study the frequency of analgesic use was also significant, and it occurred most often through self-medication. This is true for both groups. The group A used significantly more pain medication than the other students. One aspect that may have reinforced this habit was the low frequency of adverse effects experienced by the subjects.

The group A used proportionately more anti-inflammatory and opioid drugs. We attribute this difference to the greater knowledge and access to these drugs, although they increase the risk of complications.

We can conclude that the frequency of drug use for pain is higher in the group of healthcare students (group A), and self-medication is practiced equally among healthcare students and group B.

Conflicts of interest

The authors declare no conflicts of interest.

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