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SELF-MEDICATION: NON-STEROID ANTI-INFLAMMATORY AND THEIR ADVERSE EFFECTS

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Abstract: Introduction: Self-medication of non-steroidal anti-inflammatory drugs has become common practice as a number of NSAIDs are available over-the-counter and are widely used to treat minor aches and pains and other ailments. **GOAL:** To present the mechanisms, the main non-steroidal anti-inflammatory drugs and their adverse effects in the practice of self-medication according to the literature. **Methodology:** This is a literature review carried out in open databases (LILACS, BDENF, MEDLINE). The inclusion criteria established were: original articles made available in full and online in Portuguese or English, book chapters and dissertations or theses published in the period between 2009 and 2016. **Results and Discussions:** The main factors that encourage the practice of self-medication are: the ease of buying medicines without a prescription and the rapid relief of symptoms. Regarding the overdose of these drugs, one of the reasons for the occurrence of this refers to the use of old medical prescriptions by patients who have had previous experiences with NSAIDs, because in many cases the dose prescribed in the old prescription does not have the desired effect, thus causing overdose. In the adolescent population, the main justification for the practice of self-medication was pain, especially headaches, along with advertisements. **Conclusion:** The rapid relief of pain stands out as the main cause for the practice of self-medication by young people, adults and the elderly.

Keywords: Anti-inflammatory. Painkillers. Self-medication. Adverse effects

INTRODUCTION

Drug intoxication ranks first among the causes of intoxication registered throughout the country, ahead of cleaning products, pesticides and spoiled food. Analgesics and anti-inflammatory drugs are among the most

intoxicating drugs (ANVISA, 2014).

Non-opioid analgesics differ from opioid analgesics in terms of mechanisms of action and pharmacological actions. The latter, used to relieve more intense pain, can trigger situations of dependence and tolerance. Opioid analgesics relieve mild to moderate pain. Several NSAIDs are available over-the-counter and are widely used to treat minor aches and pains and other ailments.

Such drugs represent a group of chemically heterogeneous compounds, which often have no chemical relationship with each other, but share certain therapeutic actions and certain adverse effects that are mainly related to indiscriminate use or prolonged periods. All these drugs are cyclooxygenase (COX) enzyme inhibitors and can produce adverse reactions such as gastritis, gastric ulcers, gastrointestinal perforation, platelet dysfunction, hemorrhage and renal impairment (LAINE et al, 2012).

However, the high incidence of self-medication of these drug classes represents a health risk and is common in Brazil. Persistent use of a drug can lead to compulsive use (habit/addiction – a complex state that involves both psychological and physiological dependence) and the development of tolerance (RANG; DALE, 2016).

Self-medication can be classified in 3 ways, this being cultural, when products are used based on knowledge acquired over time, which is passed on through generations; guided, when the patient already has previous knowledge about the drugs he intends to use; or induced, when the use of medication is carried out due to the influence of advertising campaigns for commercial purposes (PAN et al, 2012).

Also, if the drug is used improperly, it can cause more harm than good. A drug interaction occurs when the effects of a drug are altered by the presence of another drug, food, drink or some environmental chemical agents (SILVA, 2010).

This work aims to present the mechanisms, the main non-steroidal anti-inflammatory drugs and their adverse effects in the practice of self-medication according to the literature.

METHODOLOGY

This is a literature review carried out in the open databases, International Literature on Health Sciences (MEDLINE), Database on Nursing (BDENF) and Latin American and Caribbean Literature on Science and Health (LILACS), through of the reference search on the use of non-steroidal anti-inflammatory drugs (NSAIDs).

The inclusion criteria established were: original articles made available in full and online in Portuguese or English, book chapters and dissertations or theses published in the period between 2009 and 2016. As exclusion criteria, research articles were established bibliographic and reflection articles and repeated articles in different databases. After selecting the articles related to the proposed theme, we carried out a literature review. Only studies containing the following keywords, anti-inflammatory drugs, analgesics, self-medication and adverse effects were selected. After the previous selection of these works, they were reassessed by the authors of this study, for their final selection and preparation of the Literature Review.

For the elaboration of the review study, 96 articles were found, of which: 39 (LILACS), 20 (SCIELO), 34 (MEDLINE), of which 19 articles were selected for analysis of the studies, 5 articles from 2015, 5 from 2014, 4 of 2013, 3 of 2012 and 2 of 2011.

RESULTS AND DISCUSSION

Because it is easy to buy medications without a prescription, users feel freer to buy them when they feel a symptom, in the

case of this study, the main symptom for self-medication is pain.

It was observed that the main reason for self-medication is the rapid relief of symptoms. People have medication as the fastest way and do not seek help from a professional. Use of old prescriptions and indications from close people are the most frequent practices in the indiscriminate use of medicines. Classification of non-steroidal anti-inflammatory drugs, Table 1 (MICHEL, 2010).

MECHANISM OF ACTION OF NON-STEROIDAL ANTI-INFLAMMATORY DRUGS

Arachidonic acid, in turn, is converted into prostaglandins, prostacyclins and thromboxanes from cyclooxygenase (COX) enzymes. Two types of cyclooxygenase are described: COX-1 (or constitutive) and COX-2 (or induced). COX-1 is expressed in most tissues and regulates normal cellular processes such as production of protective gastric mucus, inhibition of gastric secretion, vascular homeostasis, platelet aggregation,

Non-steroidal anti-inflammatory drugs Classification	
Non-selective (COX-1 and 2) (traditional, conventional)	**Selectives (COX-2) (COXIBES)**
Aspirina	Rofecoxibe (Vioxx)
Acetaminofeno	Valdecoxibe (Bextra)
Indometacina (Indocid)	Parecoxibe
Ibuprofeno (Motrin, Dalsy)	Celecoxibe (Celebra)
Naproxeno (Naprosin)	Etoricoxibe (Arcoxia)
Sulindac (Clinoril)	Lumiracoxibe (Prexige)
Diclofenaco (Voltaren)	
Piroxicam (Feldene)	
β-Piroxicam (Cicladol)	
Meloxicam (Movatec)	
Cetoprofeno (Profenid)	

Table 1 – Classification of non-steroidal anti-inflammatory drugs, according to their selectivity for cyclooxygenase.

and renal function. COX-2 is normally poorly detected in tissues, and is usually activated in inflammatory processes, participating in the activation of mast cells, macrophages and endothelial cells (RAHMAN, 2006).

The main mechanism of action of NSAIDs is the inhibition of cyclooxygenase, thus preventing the synthesis of prostaglandins. By inhibiting cyclooxygenase, NSAIDs cause a series of side effects (GALESIC et al, 2008).

The most used classes for pain treatment were non-opioid analgesics and NSAIDs, among them paracetamol and dipyrone, the latter being the main ones administered to children.

Acetaminophen is well absorbed orally, and its plasma half-life is about 3 hours. At therapeutic doses, it has few adverse effects. However, paracetamol overdose causes severe liver damage, often fatal, and the drug is often used in suicide attempts. Thus, attention must be payed to the risks of administering this drug to children. Considering the older population, the administration of analgesics and anti-inflammatory drugs without medical indication is a common practice, with prevalence in females, especially paracetamol and ibuprofen.

In relation to self-perception of health, the reports showed that the worse the health, the greater the pharmacological therapeutic use and the more frequent the symptoms, since the continuous use of some drugs leads to dependence and tolerance. In addition, people who have had previous experiences with some type of analgesic or anti-inflammatory, report using the medication based on old prescriptions and most of the time the dose prescribed in the prescription does not have the desired effect. Consequently, overdose of the drug occurs.

As adolescence is a phase of many transformations, the adolescents surveyed demonstrated the use of non-opioid analgesics and NSAIDs and the main justification for this was the pain, with headaches prevailing. The influence of advertisements, parental recommendation and use of old prescriptions were the causes reported by adolescents for the practice of self-medication. Education about drug interactions is still not enough for the population studied, as a considerable amount of people are not aware of the greater risks of adverse effects when using drugs simultaneously, or when there is consumption of alcohol and other drugs. There are significant relationships when self-medication is associated with alcohol and drugs.

Acetylsalicylic acid, one of the most commonly used traditional NSAIDs, is 80 to 90% bound to plasma proteins (albumin) and can be displaced from these sites, resulting in an increased concentration of free salicylate; alternatively, ASA can displace other drugs bound to plasma proteins, such as warfarin, phenytoin or valproic acid, resulting in increased concentrations of these other drugs (CLARK et al, 2013).

a) Gastrointestinal adverse effects

Gastrointestinal toxicity is the most common side effect associated with NSAIDs, and 3 different situations can occur with different severity and degree of incidence. Firstly, the appearance of symptoms such as heartburn, dyspepsia, nausea, abdominal pain that occur in 15 to 40% of NSAID users, another type of situation is the appearance of superficial lesions in the gastrointestinal mucosa such as ulcers and erosions that asymptomatic can reach in 5 to 20% of users and lastly and with greater severity, the appearance of ulcers with potentially fatal complications, such as perforations, symptomatic ulcers and bleeding and can occur in 1 to 2% of users and in this case there is an associated mortality rate from 10 to 15% (VONKEMAN; LAAR, 2010).

b) Cardiovascular adverse effects

The discovery of selective COX-2 inhibitors brought new breath to the safety of NSAIDs, however, more recently an increased risk of cardiovascular events associated with their use has been verified. This risk was also verified with the use of some traditional NSAIDs (SCHEIMAN AND HINDLEY, 2010; OLSEN ET AL., 2014; VARGA ET AL., 2013).

The use of NSAIDs is thus associated with the development of serious cardiovascular events such as myocardial infarction, thrombotic events, cerebrovascular accidents and the development of hypertension. Since the elderly are more likely to use NSAIDs and they are also the group with the highest incidence of hypertension, they are more susceptible and require greater care and attention. (SCHEIMAN AND HINDLEY, 2010; KHATCHADOURIA ET AL., 2014).

c) Adverse Kidney Effects

Another side effect of NSAIDs is renal failure, which can occur with any COX-2-selective or non-selective NSAID. Inhibition of prostaglandin synthesis can cause reversible renal ischemia, a decrease in glomerular hydraulic pressure and glomerular filtration rate, and acute renal failure. Hospitalization for acute renal failure was associated with initiation of NSAID use. Recovery occurs spontaneously within weeks to months after therapy is terminated and further use of NSAIDs must be avoided as relapse may occur.

d) Hepatic adverse effects

Hepatic adverse effects associated with NSAID use are rare, however, they may become more frequent and severe with long-term use. Several hepatic disorders have been described with the use of all NSAIDs, being in most cases mild and asymptomatic, with their regression being verified after discontinuation of treatment. However, liver damage is one of the main causes of drug withdrawal from the market, with bromfenac being an example of this and more recently, nimesulide has also been withdrawn in several countries. Sulindac is the NSAID that has shown the highest risk for the development of liver damage (MATIENZO et al., 2006)

CONCLUSION

The main cause for the practice of self-medication of analgesics and anti-inflammatory drugs by the young, adult and elderly population is the rapid relief of pain, while ASA is more used in children due to its antipyretic effect and advertising is a stimulating factor for the practice of self-medication.

Therefore, it is necessary to create preventive health strategies to clarify the population about the risks of this practice, contributing to the rational use of medicines. In the elderly population, the greater practice of self-medication is associated with lower education and worse self-perception of health.

The consumption of over-the-counter anti-inflammatories is growing, not only for specific diseases, such as rheumatoid arthritis or osteoarthritis, but also for many others, such as painful phenomena in general, including headaches, flu and menstrual cramps.

This is worrying as self-medication can increase the risk of adverse reactions. It is important to raise awareness of the conscious use of NSAIDs, opting for the lowest effective dose for the shortest possible period.

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