



THE DEMAND FOR PHARMACEUTICAL PRODUCTS USED BY ATHLETES TO TREAT MUSCULAR AND ARTICULAR AFFLICTIONS- A FARMACOECONOMIC STUDY

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Abstract

Objectives. The demand for pharmaceutical products used to treat muscular and articular afflictions has registered a continuous growth, among the population as well as among athletes. This market growth is based on pharmaceutical industry products, obtained through synthesis or semi-synthesis, through plants or plant extracts. Taking into account the rules and restrictions imposed by the organizations that overlook athletes health, but also the restrictions regarding the usage of certain active substances banned in sport completions, a growth in the demand of natural pharmaceutical supplement that treat muscular and articular afflictions can be seen.

By analyzing the dynamic demand of this certain category, on the pharmaceutical market, a significant growth has been registered regarding the sales percentage of the pharmaceutical entities turnover. The recent fiscal measures, regarding the reduction of the VAT (Value Added-Tax) quota from 24% to 9% for pharmaceutical supplements will also determine a continuous growth demand.

Key words: naturist products, market demand, muscular and articular afflictions, fiscal regulations.

Introduction

Muscle cramps are involuntary contractions that occur suddenly that can be intense and painful, localized in the skeletal muscle areas. Muscle contractions can occur due to an effort that overwhelm those areas such as a result of sports training, muscle stretching, bad posture or an extended sitting position.

Muscle contraction represents the painful shortening of the soft tissue fibers and is considered an excess of muscle tone by keeping intramuscular tension over its physiological limits. The permanent intramuscular tension pressing on vessels and intramuscular capillaries are causing an intramuscular circulatory system deficiency, which causes poor muscle oxygenation. Thus, the accumulation of carbon dioxide in causing muscle pain.

The main causes for muscle cramps and joint pains

Among the causes of muscle cramps we can include (count):

- reduced levels of magnesium, calcium and potassium in the blood, minerals that are directly involved in nerve impulse transmission and muscle contraction;
- intense exercise done without an adequate warm up, dehydration and exhaustion due to

physical effort or excessive heat;

- hampered peripheral circulation of blood;
- deficiency of vitamins B1, B5, B6;
- deficiency in hesperidin (a flavonoid) which is a compound associated with vitamin C, especially in citrus and determine the normal functioning of blood vessels;
- obesity;

To relieve muscle tension and joint discomfort but also for maintaining joint mobility and flexibility we resort to physical therapy and physiotherapy as well as the administration of drug treatments with synthesis and semi-synthesis pharmaceuticals, nutritional supplements, and products based on plant or plant extracts.

Joints make the connections between bones and provides support and commissioning of body movement. Pain occurring at this level can vary in severity from mild to extremely aggressive.

Joint pain known as arthralgia can occur both in athletes and among populations of any age.

The cause of joint pain may be itself or related structures that come into contact with the respective tendons, joints and muscles. Inflammatory joint pain can occur affecting athletes from the smaller joints of the hands and feet to the spine.

Causes that can cause joint pain are

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inflammatory arthritis (joint inflammation), local lesions (bumps limbs, fractures, dislocations or fractures of cartilage and tendons) and obesity among the population.

Joint pain can be treated with anti-inflammatory drugs prescription (administered dermal and / or oral), rest, massage and also by natural methods.

The aim of the paper

The aim of this study is to highlight the demand for anti-inflammatory medications and supplements designed to treat muscle and joint disorders.

Materials and methods

For the study we used the retrospective analysis of information regarding the demand of pharmaceutical products for improving muscle contractures and arthralgia, provided by the quantitative value of the pharmacy records studied, and specialty materials studied.

Results and discussion

Given the regulations on the administration of banned substances athletes competing in sports competitions, trying to ameliorate the pain caused by muscle stiffness, joint pain and trauma, are turning to alternative solutions allowed, namely

pharmaceuticals with anti-inflammatory effect that reduces and relieves the cause of pain.

Thus, athletes are receiving allowed medications, herbal medicines and plant extracts or nutritional supplements which will also represent our object of study.

The current trend in the pharmaceutical industry consists in the obtaining of the specific products by using more plants or plant extracts which are allowed to be administered by athletes.

Pharmaceutical research has shown the beneficial effects of certain categories of plants in relieving joint pain and removing the causes that leads to muscular contractions.

To highlight the demand for pharmaceuticals used to improve these conditions, we conducted a study in a pharmaceutical unit from Prahova County.

In practice, athletes, who need to relieve and eliminate muscular pain, even though the most commonly used procedures are manual therapy or massage and stretching, often they choose a faster effect and resort to drugs or herbal treatments.

Thus, to prevent muscle pain, athletes are advised to take supplements, as found in the study conducted (Table 1).

Table no. 1 - Top 5 supplements issued by the studied pharmacy

Nr. crt.	Product name	Substance / extract	Quantity released (boxes) / month	Action / Recommendation
1.	Rumalaya tablets	Mahayograj guggul; Shankha bhasma; Shilajeet; Hibiscus abelmoschus, Swarnamakshik bhasma ; Extracts from Maharasnadi guath	27	Anti-inflammatory and analgesic, reduce morning stiffness, swelling, increases mobility of joints and improves quality of life.
2.	Omega 3 Doppelhertz	Salmon Oil	64	Reduce blood lipid levels, beneficial influences over the cardiovascular system, relieves joint pain, and may reduce the dose of anti-inflammatory nonsteroidal drugs (NSAIDs)
3.	Shark Cartilage	Cartilage de Requin	26	Remineralizing, anti-inflammatory, increases joint mobility, reduce the effects of muscle injuries.
4.	Zdrovit-Mg+Ca+Zn	Calcium, Magnesium, Zinc	110	Relaxes the muscular system, ensures optimal intake of vitamins and minerals when unbalanced diets, physical demands and sports activities.
5.	Fleximobil	Harpagozide, Glucozamina, Condroitina	81	Similar actions as the NSAIDs, relieve pain and inflammation, recommended in osteoarthritis.

Source: financial accounting statements of pharmacy studied, 2014

From the information presented in table. 1, it can be seen that the best dietary supplement issued for pain killers are products that contain calcium, magnesium, zinc, and products that can be administered by athletes without restrictions.

The demand for nutritional supplements will be significantly influenced in the next period as a result of fiscal measures taken on VTA reduction from 24% to 9%, which will significantly reduce their prices.

Due to fear, but also of the rules imposed by the National and International Agencies of Anti-Doping for prevention and fighting against doping in sport, and in accordance with the 2015 Prohibited List and "Prohibited List International Standard - 2015 World Anti-Doping Agency's", athletes often resort to herbal or natural products containing plant extracts which have an unrestricted use (table no. 2).

Table no. 2 - Top 10 natural products allowed to be used by athletes

Nr. crt.	Product name	Substance / extract	Quantity released / month	Value / Action
1.	Cream Dr Boice	Extracts of hellebore (<i>Helleborus purpurascens</i>), Chestnut (<i>Aesculus hippocastanum</i>) and oil of juniper (<i>Juniperus communis</i>)	27	-antialgic, anti-inflammatory, vasoregulator and stimulating capillary circulation;
2	Devil's claw antiinflammatory gel	Eucalyptus, ginseng, lemongrass and rosemary	41	-anti-inflammatory, analgesic and protection of liver function;
3	Relaxing Gel with Hellebore	Hellebore extract, chestnut and juniper	22	-muscle relaxation after effort, muscle pain; maintaining joint mobility; rapid resorption of hematomas; alleviate edema and swelling;
4	Bear Power Gel antirheumatic	Mint, eucalyptus, ginseng and grape-vine	36	- alleviate muscle pain, soothe and reduce inflammation, stimulating circulation;
5.	Burdock root tea	<i>Arctium lappa</i> L. plant roots, fam. Asteraceae	27	-anti-inflammatory, muscle pain and rheumatism;
6.	Tea leaves of comfrey	<i>Symphytum officinale</i>	38	-rheumatism, gout, arthritis, spondylitis, discopathy;
7.	Tea sage	<i>Salvia officinalis</i>		-the heart tonic, astringent and anti-inflammatory;
8	Biomobil Gel 50ml Fares	Pepper extract (extractum CAPS), rosemary oil (<i>Rosmarini aetheroleum</i>), camphor (<i>Camphora</i>), marigold extract (extractum flos <i>Calendulae</i>), St. John's Wort extract (extractum herba <i>Hyperici</i>), Triethanolamine, nipagin, Carbopol 940	18	-elimination of joint discomfort, maintain joint mobility and flexibility; -rheumatism, lombosciatica, nerve, muscle contraction;
9	Reumabloc- Sun Wave Pharma	<i>Boswellia Serrata</i> Extract, <i>Curcuma Longa</i> , <i>Vitex negundo</i>	53	-muscle pain and rheumatism, bruises, sprains, fractures, tendonitis, bursitis,

				contractures and muscle strains that occur in athletes;
10	Tone the tonic and relaxing cream 50 g	Arnica tincture, sea buckthorn oil, camphor and spearmint oil	73	-tonic, anti-inflammatory, stimulating peripheral blood circulation to the skin; -relaxes muscles after a prolonged effort or if various cases of muscle pain;

Source: financial accounting statements of pharmacy studied 2014

Given the extended action of herbal natural products and plant extracts because of the unrestricted use of these product categories, they are preferred and frequently used by athletes.

Since there is a risk of permanent injury to athletes, both in training and during the competition, they turn to rapid effects and anti-

inflammatory medication that relieves muscle and joint pain, as presented in Table. 3.

Table no. 3 - Anti-inflammatory drugs that can be administered to athletes

Nr. crt.	Product name	Substance / extract	Quantity released / month	Action / Recommendation
1.	Buffered aspirin	Acetylsalicylic acid	520	-controlling pain for mild to moderate headaches, muscle pain, rheumatic pain, joint pain, muscle pain; -fighting fever and joint inflammation;
2.	Piroxicam creme	Piroxicam	96	-extrainflammatory joint pain(muscle pain, inflammation of the tendons back with spinal cord compression); inflammatory rheumatic diseases;
3.	Ibalgin ointment	Ibuprofen	71	-Musculoskeletal pain, rheumatic or muscular pain, sprains and dislocations of neuralgia, back pain; osteo-articular muscle pain or traumatic nature (slight injury of the tendons, ligaments);
4.	Ketonal gel	Ketoprofen	42	- conditions of pain and muscle damage, topical NSAIDs;
5.	Bengay	Methyl salicylate and mentol	58	-topically administered relieves pain in joints and muscles;
6.	Diclac ointment	Diclofenac Sodium	73	-reducing inflammation and pain in the joints and muscles;

Source: financial accounting statements of pharmacy studied 2014

The trend of drug consumption among athletes is generally restricted, natural products being

preferred, which gives them freedom in administration.



To prevent muscle contractures and arthralgia, athletes adopt a proper healthy diet, by eating fruits and vegetables, high in contents of magnesium, vitamin B complex REC, iron, vitamin C, essential fatty acids, such as grapes, bananas, melon, parsley, broccoli, spinach, etc.

The study highlighted the dynamic evolution of the demand regarding the best released permitted drugs to be used by athletes, with anti-inflammatory action, dietary supplements, pharmaceutical products based on plants or plant extracts, as presented in Tables. 1, 2, 3.

Conclusions

Given the information gained from the study to improve muscle and joint pain, athletes will have to turn to products containing vitamins and minerals which are allowed substances, thus they avoid breaking the rules imposed by the Anti-Doping Agency, and not risking elimination from any sport competitions.

Therefore, they will adopt a healthy lifestyle and diet, proper hydration and a style of movement properly so as to avoid muscle contractures and arthralgia.

We appreciate that the fiscal measure to reduce VAT will significantly influence consumption and the demand for supplements.

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