Journal of Advances in Science and Technology

Vol. V, No. X, August-2013, ISSN 2230-9659

MUSCULOSKELETAL PAIN: A STUDY ON VARIOUS CONTRIBUTORY AND ALTERNATIVE REMEDY METHODS

www.ignited.in

Journal of Advances in Science and Technology
Vol. V, No. X, August-2013, ISSN 2230-9659

Musculoskeletal Pain: A Study on Various Contributory and Alternative Remedy Methods

Chinoy Danesh Dinyar

Research Scholar, CMJ University, Shillong, Meghalaya

Abstract – The utilization of contributory and alternative medicine (CAM) is high and expanding worldwide. Patients generally utilize CAM within expansion to accepted medicine, for the most part to treat pain.

In an expansive number of cases, people utilize CAM for chronic musculoskeletal pain as in osteoarthritis, back pain, neck pain, or fibromyalgia. Herewith, an audit is displayed of CAM efficacy in treating musculoskeletal pain for which, nonetheless, no scientific examination has so far furnished confirmation robust enough. In some extraordinary situations where satisfactory pain control can't be accomplished, CAM could be recognized in judicious and singular approach dependent upon the first general control in medicine "not to mischief" and on the utility hypothesis of every intercession, i.e. consistent with the assumed instrument of painful jolt what's more with close observing of the patient's reaction. Further amazing studies are justified to illustrate the efficacy and reactions of CAM systems. Thusly, ordinary medicine remains the primary mode of medicine for patients with musculoskeletal painful conditions.

----------♦----------

INTRODUCTION

The meaning of contributory and alternative medicine (CAM) is wide and continually evolving. In distinctive parts of the world, the term has diverse significance, knowing particularly the way that one-third of the world's populace and more than 50% of the poorest people in Africa and Asia have no right to gain entrance to accepted medicine (Cm) whatsoever. The World Health Organization (Who), as the umbrella organization for human health, characterizes CAM as "all types of health mind which normally lie outside the official health segment". A definition by Cochrane Collaboration is:

"Contributory and alternative medicine (CAM) is a wide space of recuperating assets that envelops all health systems, modalities and practices and their going with speculations and convictions, other than those natural to the politically overwhelming health system of a specific social order or society in a given authentic period. CAM incorporates all such practices and thoughts self-characterized by their clients as anticipating or treating disease or pushing health and well-being. Verges inside CAM and between the CAM dominion and that of the prevailing system are not dependably sharp or altered".

The utilization of CAM is high and expanding worldwide. As per the study by Eisenberg et al., the number of CAM clients in the Us expanded in the period from 1990 to 1997 by more than half, while information from 2001 indicated the amount of CAM clients in the mature person Us populace to sum to 67%. A later study led by Callahan et al. uncovered that the same amount as 82% of patients with joint pain followed in primary forethought and 90.5% of the aforementioned followed by specialist had attempted no less than one contributory therapy for joint pain symptoms6. Longitudinal studies led to the 1994 exploration by Fisher et al. in Western Europe, the rate of populace reporting utilization of CAM was between 20% (The Netherlands) and 49% (France). Who reports that the amount of patients in advanced nations (counting Western Europe) utilizing no less than one type of CAM is even 70%-80%. With respect to Croatia, in the study by Čižmešija et al., 53.5% of patients treated by primary forethought utilized CAM within expansion to customary health mind and more than 50% of the respondents (59.6%) educated their doctor about it.

The most well-known explanation behind the utilization of CAM is pain. The extensive amounts of patients who are utilizing CAM are experiencing chronic musculoskeletal pain. The reason for chronic pain is normally multifactorial what's more unpredictable. Prompt and complete easing of chronic pain can regularly be an improbable objective, so it is important to create sensible focuses in the medication of these patients. These infer a pain alleviation approach consistent with the patient's existence circumstance ("patient particular connection"), enhancing the patient's pain or enhancing the personal satisfaction and progressing the patient's hazard profile by decreasing his/her need of polypharmacy, obtrusive mediations or doubtful alternative helps. This approach requires a broader picture in managing pain through integrative medicine that joins together CAM and Cm. Most

patients utilizing CAM don't waive the administrations of Cm. Nonetheless, as per a study directed in Croatia, the most much of the time said reason for the utilization of CAM (with Cm) is the need of a particular advisor who will help them tackle the issue which Cm has not distinguished or has not uncover an answer for.

CAM is done by doctors of medicine and other CAM professionals (acupuncturists, chiropractors, Reiki professionals, and so on.). The status of these specialists is diverse in distinctive nations. In the Us, there is the National Center for Contributory what's more Alternative Medicine as a major aspect of the National Foundations of Health. In Croatia, they are assembled in the social order of alternative specialists and healers of the Croatian Association for Natural, Energy and Spiritual Medicine. Croatia still has no lawful system for CAM, in spite of the fact that exertions are presently in advancement to characterize this zone. The enactment in the European Union (EU) is unique in relation to nation to nation and consequently the following steps around there will absolutely be towards harmonization of the CAM enactment in all EU nations, particularly having at the top of the priority list the way that the expanding utilization of CAM unavoidably builds the amount of CAM symptoms.

People with musculoskeletal pain deplete a considerable measure of distinctive "common health items" and different mediations, the remedial efficacy, reactions and instruments of movement of which have not yet been sufficiently elucidated. The point of this audit is to assess the efficacy and wellbeing of CAM for the medication of musculoskeletal pain.

ACUPUNCTURE

Acupuncture is part of a larger system healing within the traditional Chinese medicine characterized by the insertion of fine, solid metallic needles into or through the skin at specific sites. It is more than 3000 years old. According to the traditional interpretation, bioenergy in the body flows through the meridians, which connect the surface of the body with the interior of the body, and the essence of acupuncture is that the stimulation of acupuncture points affects the “flow of energy”. A contemporary “Western” medical science fails to recognize the traditional interpretations of unblocking the “bioelectric magnetic force” (“QI”) through the invisible energy channels (meridians) and tries to explain the possible analgesic effect of acupuncture through various neural, humoral and biomagnetic mechanisms such as changing neural innervation (local anesthesia at the insertion site completely reverses the analgesic effect of acupuncture), by releasing endogenous opioids in the brainstem, subcortical and limbic structures, by releasing adenosine at the insertion site and/or by changing the blood flow. In addition, when applying acupuncture, certain central nervous system (CNS) changes were observed on the functional magnetic resonance imaging (MRI) and positron emission tomography (PET) scan. It has been shown that acupuncture as an adjuvant therapy may have beneficial effects in various diseases and musculoskeletal conditions. The two most common acupuncture therapy treatments are for neck pain and low back pain. A systematic review of the literature showed moderate evidence that chronic mechanical neck pain was more effectively treated with acupuncture than with inactive treatment, measured immediately after treatment and during shortterm monitoring (standardized mean difference -0.37, 95% CI -0.61 to -0.12). There is limited evidence that, in the short-term period, acupuncture is more effective than massage. In cases of neck pain with radicular symptoms, it was found that, again in the short-term period, acupuncture was more effective than waiting list control. As for low back pain, the data do not allow firm conclusions about its effectiveness for acute pain. For chronic back pain, acupuncture was more effective in reducing pain and accelerating functional recovery immediately after treatment and during short-term monitoring, leading to the conclusion that in this indication it can be recommended as a supplement to other therapies. A meta-analysis conducted on studies with 6359 patients showed that real acupuncture was no better than “sham” acupuncture, but both were better than none, pointing out the importance of the placebo effect of acupuncture. The Cochrane Back Review Group paper, which included 20 studies, also found that the short-term effect of acupuncture was significantly better when compared to waiting list control or when acupuncture was added to another intervention. Acupuncture can reduce pain and improve joint function in patients with knee osteoarthritis (OA). In a systematic review of literature on the effect of acupuncture in rheumatoid arthritis (RA), the authors found only two papers that met the methodological criteria and concluded that acupuncture showed no statistically significant effect on pain versus control group (relative improvement of 8%), although a tendency of decreasing pain was recorded (4 points on a 1-100 scale). Based on the limited number of high-quality studies in fibromyalgia, the authors concluded that the treatment using real acupuncture was more effective than placebo acupuncture. In order to reactivate and deactivate trigger points in the myofascial pain syndrome, “dry” injections and the injection of anesthetics had a similar effect. It seems that some types of acupuncture are more effective in achieving analgesia than others.

This mainly refers to electroacupuncture, which strongly activates opioid and nonopioid analgesics. A relevant study on the effect of electroacupuncture is the one by Man et al., where this method led to a significant reduction in knee pain 24 hours after the treatment, with relative improvement of 66.6% compared to the placebo group. The relative improvement after 4 months was 5.1%, also in favor of the therapeutic group. It is of note that acupuncture is a safe method with few side effects. Minor and

transient complications were observed in approximately 5% of cases, while serious side effects are very rare.

YOGA

Yoga is generally regarded as a CAM approach to health in order to improve flexibility, muscular and mental strength, emotional stability, self-confidence and peace of mind. A growing number of physicians and patients today recognize yoga as a contributory therapy option and try to incorporate it in the conventional methods of treating musculoskeletal diseases.

One high quality study found that a 6-week training of Viniyoga (therapeutically oriented yoga) was slightly more effective than conventional exercise in chronic low back pain, with mean difference (MD) in Rolland Morris disability questionnaire (RMDQ) of -1.8 (95% CI -3.5 to -0.1) and was moderately better than self-care educational book MD in RMDQ being -3.4 (95% CI -5.1 to -1.6). It has been shown that yoga has a beneficial effect in patients with knee OA as an addition to conventional treatment. A recent study revealed yoga (Iyengar yoga) to have a positive effect in decreasing pain, functional joint impairment and depression in patients with chronic back pain. Moreover, it was shown that it could reduce the symptoms of hand OA55 and had beneficial effects in younger patients with RA. In a report which included 11 studies (4 randomized controlled trials (RCT) and 4 non-RCTs, heterogeneous methods of research, diagnosis and intervention), the authors' conclusion was that there was strong evidence that yoga reduced the symptoms of arthritis (swelling/tenderness of joints, pain) and disability, while reinforcing self-confidence and mental health57. There still remains the question of the impact of other different types of yoga (Bikram, Vinyasa) on musculoskeletal symptoms.

MANUAL MEDICINE

The field of manual medicine comprises of control, assembly, and also rub and osteopathy. Control is by definition the provision of high speed and low abundancy manual pushes to the joints somewhat past the inactive run of joint motion. Fundamentally, in the spine it expects to change the mechanical conduct of the practical spinal unit.

Preparation is the provision of manual compel to the joints inside the uninvolved extend of joint movement that does not incorporate a push. In practice, control also preparation are mostly utilized within the same bundle of medicine. Despite the fact that it is regularly identified with chiropractic, spinal control goes back to old times.

Spinal control is accepted to have been drilled in China as far back as 2700 BC. Likewise, it is portrayed in the Hippocrates' papers. In India, it was recognized as a demonstration of hygiene and it made part of surgery.

The present day time of spine control starts in 1975, when the first scientific gathering in the Usa was held. Control and preparation are most usually utilized within treating back pain and neck pain, despite the fact that there is still no agreement on the issue which could be treated with manipulative strategies. It has been inferred that control and activation ought to be utilized as a part of segmental intervertebral joint brokenness, subluxation or useful spinal sores (FSL). The result of fruitful control is the recuperation of typical capacity and diminishing the symptoms brought on by FSL. A systematic dissection of 42 studies by Bronfort et al. inspected the efficacy of spinal control also activation in patients with chronic low back pain. The creators' decision was that there was direct prove on spinal control with reinforcing exercises being as adequate as the utilization of non-steroid calming medications (NSAIDs) with restorative exercise (in the fleeting and long haul follow-up). Moreover, there was direct proof that activation was more effective than remedial exercise, restricted proof that control was better than physical therapy and home exercises, and that it was as adequate as chemonucleosis in instances of lumbar plate herniation, yet less viable than helpful exercise after herniated plate surgery. In their past study, the same creators discovered direct prove that spinal control had an improved pain relieving impact than activation and diathermy in patients with intense low back pain and restricted proof of quicker recuperation thought about to customary physical therapy. Van Tulder et al. inspected 25 randomized studies with respect to spinal control in patients with intense and chronic back pain. They reasoned that spinal control was more adequate than placebo and just as viable as other preservationist medicine strategies for back pain (drugs, physical therapy, restorative acrobatic and low back pain school). In an alternate survey, Assendelft et al. broke down 39 Rcts and neglected to find prove that spinal control was better than other standard strategies in the medicine of patients with intense or chronic back pain. With respect to chronic neck pain, in a systematic survey, direct proof was discovered that spinal control and activation diminished pain in the fleeting and long haul period, and there was solid prove for diminishing pain and change of capacity when applying restorative exercise nearby with manipulation/mobilization. Spinal control is the main CAM strategy for treating back pain joined in guidelines for the medication of intense low back pain in a few countries.

STATIC MAGNETS

Static magnets are sold in different forms, e.g., incorporated into arm and leg wraps, mattress pads, bracelets, necklaces and shoe inserts74. They are marketed with claims of effectiveness in reducing pain, although evidence of scientific principles of biological mechanisms to support such claims is very limited.

Static magnets industry is a multi-billion dollar industry. Although the exact mechanism in pain reduction is not certain, the proposed one is the attenuation of neuronal depolarization by shifting the membrane resting potential of nociceptive C fibers and/or promotion of an increase in blood flow through the skin and the subcutaneous and muscular tissue. A systematic review and a meta-analysis of 9 randomized placebo controlled trials failed to prove the efficacy of static magnets in pain reduction (weighted mean difference (WMD) on the 100-mm visual analog pain scale (VAS) was 2.1 mm, 95% CI 1.8 to 5.9 mm, p=0.29). A study by Richmond et al. investigated the effect of

magnetic and copper bracelets (2 groups wearing magnetic bracelets with different levels of magnetism, one group wearing copper and one group wearing demagnetized bracelets) over 16 months and concluded that there were no differences regarding pain, stiffness or physical function in patients with OA.

SUPPLEMENTS

Glucosamine, chondroitin, diacerein : Glucosamine and chondroitin are parts of proteoglycans. It has been proposed that glucosamine stimulates the production of glycosaminoglycans (the key structural components of cartilage) and normalizes the cartilage metabolism, inhibits its degradation and fibrillation, and have an anti-inflammatory effect, resulting in a decrease of pain and other symptoms, i.e. improving/maintaining function, as well as retarding the progression of OA.

A meta-analysis by Vlad et al. showed that the benefit from glucosamine and chondroitin was not proven, while glucosamine hydrochloride preparation alone was not efficacious. In a recent systematic review including 25 studies with 4963 patients, the Cochrane Collaboration reported that the effectiveness of glucosamine was limited to glucosamine sulfate but was not demonstrated for glucosamine hydrochloride.

Differences between the preparations of the original manufacturer (Rottapharm) compared to the others were also emphasized. Compared to placebo, the authors found a 22% decrease for pain and an 11% improvement of function (a change according to the initial value) by using Lequesne index, while, surprisingly, there was no statistically significant positive effect on the dimension of pain, function and stiffness in the WOMAC questionnaire. Similar to some international guidelines, the stand of the Croatian Society of Rheumatology is that, along with other therapeutic modalities, it might be rational to try to treat patients with knee/hip OA with glucosamine and/or chondroitin, and if the obvious response fails after 6 months, their usage should be stopped.

PHYTOCHEMICALS AND PLANTS (EXTRACTS)

Ginger (Zingiber officinale) and turmeric (Curcuma longa) : People with musculoskeletal pain consume a lot of different ‘natural health products’ therapeutic efficacy, toxicity and mechanisms of action of which have not yet been sufficiently clarified. Ginger and turmeric are herbs from the same family (Zingiberaceae). Ginger is a very popular spice produced in more than 100,000 tons per year worldwide. In the traditional medicine of Japan, China and India, it is known and recognized for its anti-inflammatory effect on musculoskeletal diseases.

Studies on the effect of ginger on musculoskeletal pain are contradictory. In some studies it was shown to be moderately more efficient than placebo in reducing symptoms in treating knee OA; in one study, its efficacy did not differ from that of placebo in the first 3 months, however, demonstrating superiority in the next 3 months, whereas in another study there was no difference in the efficacy when compared to placebo. The most comprehensive reporting of adverse events found these in 59% of patients receiving ginger extract compared with 37% of those receiving placebo, with gastrointestinal events particularly relating to eructation, dyspepsia and nausea as most pronounced (45% of patients taksing Ginger vs. 16% of those taking placebo), although 70% of them were evaluated as mild. None of other trials has reported any overall excess in adverse events, although bad taste was reported in those taking ginger extract.

Some preliminary studies showed that turmeric could somewhat improve symptoms in rheumatoid arthritis, but at concentrations no greater than those to be taken with food. So, ginger and turmeric are safe for consumption, but in small quantities have no proven effect on chronic painful rheumatic conditions.

Pine bark : This herbal extract has been tested in the treatment of knee OA. In the first trial including 100 patients, after 3 months of treatment with Pycnogenol 150 mg daily, the patients reported reduced pain ($P<0.04$) and improvement in function ($P<0.05$), whereas those on placebo demonstrated no change. In the second trial that included 156 patients who were taking Pycnogenol 50 mg twice daily also reported significant improvements in function, whereas there were no changes in the placebo group. They also demonstrated a decreased use of NSAIDs (58% vs. 1% reduction) and consequently of gastrointestinal complications (63% vs. 3% reduction)115. No serious adverse effects were noted on Pycnogenol in either trial.

Rose hip : The efficiency of this herbal medicine has been tested against placebo in three studies in

patients with OA, with sample sizes ranging between 94 and 112. The tested doses were 1 g for 4 months, 5 g of Hyben Vital (a standardized powder) for 3 months and the same preparation for 4 months. In all three trials, there were at least some positive results regarding the use of rose hip. In a cross-over trial that included patients with OA of several sites, there was a highly statistically significant difference just for the first treatment period, an effect that the authors viewed as signaling a strong carry-over effect. In the second trial in patients with hip or knee OA, at the end of the 3-month follow-up there was a significant improvement in those taking rose hip regarding performing

activities of daily life, stiffness, patient global assessment, although there was no significant difference in pain. In the last trial that also included patients with knee or hip OA, both pain and hip range of motion (although not the knee range of motion) had improved more in the rose hip group. None of the trials reported any difference in adverse events between the groups.

BOSWELLIA SERRATA (INDIAN ROOTS)

Its efficacy in knee OA was tested in three RCTs. The first trial was a placebo controlled trial with a cross-over design, involving 30 patients. When receiving Boswellia (B.) serrata, the patients demonstrated significantly greater reduction in pain, swelling and improvement in function over 8-week treatment with 333 mg of the product three times daily. The second trial tested 5-Loxin, which is an extract of B. serrata enriched with 30% 3-O-acetyl-11-keto-beta-boswellic acid. Seventy-five subjects received 100 or 250 mg 5-Loxin, or placebo, for 90 days. Both doses of 5-Loxin conferred significant pain and function improvement compared with placebo ($P<0.0001$ for both doses). In the last trial, B. serrata 333 mg three times daily was tested against valdecoxib 10 mg once daily for 6 months. At the end of the study, both B. serrata and valdecoxib demonstrated significant reduction in pain from baseline and the latter also in function ($P<0.001$ all). One month after stopping treatment, the group taking B. serrata demonstrated maintained improvement regarding pain and function ($P<0.001$). There were no serious adverse events reported in any study nor were adverse events of any sort significantly more common in the groups taking B. serrata.

Cannabis : There are many differences of opinion regarding the use of cannabis for medical purposes. A study conducted in The Netherlands was in favor of smoking cannabis for medical purposes. Result was good to excellent reduction in symptoms in most patients (64%) with neurological and musculoskeletal diseases and cancer anorexia/cachexia, with mostly mild side effects. A recent study by Ware et al. showed that smoking marijuana can reduce neuropathic pain and posttraumatic postoperative pain measured on an 11-point scale (5.4:6.1 MD, 95% CI 0.02 to 1.4; $p=0.023$) and improve sleep ($p<0.05$), at least for 3 months124. The prevalent attitude is that in spite of moderate effectiveness of treating chronic pain with cannabis, it is still considered inferior to its potential harm125. A study by Xu et al., published this year, stated the ability to treat neuropathic pain with new drugs which target the CB2 receptors mostly located in the peripheral immune system (as opposed to CB1 receptors, which are mostly in the brain). It opens new opportunities to create drugs with fewer side effects in treating this kind of pain.

Vitamins: Generally, vitamins are used as supplements in case of their deficiency. Some vitamins might have an impact on musculoskeletal diseases, mainly as antioxidants. They are able to neutralize most kinds of reactive oxygen species (ROS) with a degradation effect by enzymes such as superoxide dismutase, catalase and peroxidase, or by small antioxidant molecules.

When ROS are produced in increased amounts as in OA, the antioxidant capacity of cells and tissues can become insufficient to detoxify the ROS, which then contribute to cartilage degradation by inhibiting matrix synthesis, directly degrading matrix molecules or activating matrix metalloproteinases.

Vitamin C is mostly (80%-90%) found in food (rose hips, blackcurrant, citrus fruits), but can also be synthesized from glucose. The Framingham epidemiological study showed a threefold reduction in the risk of OA progression for the middle and highest tertiles of vitamin C intake, as well as a reduced loss of cartilage135. In a high-quality RCT, taking large amounts of vitamin C (2x1 g) led to a decrease of pain on the VAS scale by 4-6 mm (the baseline value was 50 mm)136. However, regarding the recommendation of taking high doses of vitamin C, especially for older people who suffer from OA, there is the need of further research which will look into the long-term effect, as well as in the safety of vitamin C.

Vitamin E was tested (in its natural form in 8 shapes or as α-tocopherol) in five RCTs. The results were divergent. Two studies showed that vitamin E was superior to placebo (vitamin E intake of 600 mg per day and 400 IU of α-tocopherylacetate once a day), one showed that the effect of vitamin E (544 mg α-tocopherylacetate) was equal to the effect of diclofenac (150 mg/day) on the VAS scale of pain, while in two recent studies the efficacy of vitamin E was not better than placebo. One of the richest food sources of vitamin E is edible plant oil.

Vitamin D is for historical reasons included in vitamins, although the majority of its characteristics indicate it is a hormone (steroid structure, mechanism of action). Vitamin D is considered a prohormone with

different active metabolites that play an important role in many physiological processes including the metabolism of bone and cartilage, the muscles, and lately an inverse correlation of its serum levels with disease activity in early polyarthritis has also been emphasized. A Framingham study found a three times greater increase in the risk of hip OA progression in the middle and lowest tertile of serum vitamin D. A study on osteoporotic fractures in women noticed an increased risk of incident hip OA (joint space narrowing), which might be associated with pain at medium and lowest tertile of serum vitamin D. A research by the European Male Aging Study Group revealed that patients with musculoskeletal pain had lower levels of serum vitamin D. Indirect effects of vitamin D on pain have been reported by Bishoff et al., as in their study the consumption of vitamin D (and calcium supplements) reduced the risk of fall by even 49%.

Glucosides : Natural remedies that contain glucosides derived from white peony root extract are believed to have anti-inflammatory, antioxidant and immunoregulatory effects. In the changed inflamed joints, a several-fold concentration of nitric oxide (NO) has been recorded, as well as increased activity of the enzyme that regulates its formation. Glucosides inhibit the increased levels of NO in painful and inflamed joints and change its concentration back to normal levels, thus having the potential of reducing pain and stiffness of the joints. Their effect is achieved at the molecular level, which has so far been proven in preclinical studies, although there are some encouraging studies with the observation of the favorable effect of total glucosides alongside with disease-modifying antirheumatic drugs (DMARDs).

MIND-BODY THERAPY

Mind-body therapies include cognitive behavioral therapy, hypnosis, biofeedback and mindfulness meditation. For many patients, the addition of a mindbody approach to treating chronic pain has a beneficial effect on their quality of life. From the above stated therapies, cognitive behavioral therapy is often included in the conventional treatment of chronic pain and relies on scientifically based knowledge and theories of cognition, emotions and behavior, their interaction and possibilities to change. The report of the Cochrane group (40 studies) showed that cognitive behavioral therapy had a favorable effect on pain, disability and mood.

CONCLUSION

There is an extremely large number of products and CAM interventions on the market today, which are mainly presented through the media as effective in treating musculoskeletal pain. The majority of data presented in this paper are of insufficient methodological quality, there is a striking paucity of RCTs, evidence is based on a small number of trials which generally included a small number of patients. One must take in consideration the publication bias favoring papers with positive results.

So, generally, with some exceptions, there is no solid enough scientific evidence to support the use of CAM in musculoskeletal painful conditions. To be able to clearly define the mechanism of action of most of the CAM interventions, additional highquality studies that deal with their molecular basis and mechanism of action are required, while clinical data are missing too. On the other hand, most of CAM medications/interventions are free from major adverse effects and usually are associated with minor adverse effects. A rational attitude using them only in some situations when conventional medicine is not effective in controlling pain might be considered, but always keeping in mind the first rule of medicine “not to harm”.

REFERENCES

- Reilly D. Comments on complementary and alternative medicine in Europe. J Altern Complement Med 2001;7 (Suppl 2):23-31.
- Zollman C, Vickers A. ABS of complementary medicine. Users and practitioners of complementary medicine. BMJ 1999;319:836-8.
- Fautrel B, Adam V, St-Pierre Y, Joseph L, Clarke AE, Penrod JR. Use of complementary and alternative therapies by patients self-reporting arthritis or rheumatism: results from a nationwide Canadian survey. J Rheumatol 2002;29:2435-41.
- Eisenber g DM, Davis RB, Ettner SL, et al. Trends in alternative medicine use in the United States, 1990-1997: results of a follow-up national survey. JAMA 1998;280:1569-75.
- Kessler RC, Davis RB, Foster DF, et al. Long-term trends in the use of complementary and alternative medical therapies in the United States. Ann Intern Med 2001;135:262-8.
- Callahan LF, Wiley -Exley EK, Mielenz TJ, et al. Use of complementary and alternative medicine among patients with arthritis. Prev Chronic Dis 2009;6:44.
- Emslie M, Campbell M, Walker K. Complementary therapies in a local healthcare setting. Part 1: Is there real public demand? Complement Ther Med 1996;4:39-42.
- Gureje O, Von Korff M, Simon GE, Garter R. Persistent pain and well-being: a World Health Organization study in primary care. JAMA 1998; 280:147-51.
- Lynch JR, Schmale GA, Schaad DC, Leopold SS. Important demographic variables impact the musculoskeletal knowledge and confidence of

academic primary care physicians. J Bone Joint Surg 2006;88:1589-95.

- Giordano J, Schatman ME. A crisis in chronic pain care: an ethical analysis. Part Three: Toward an integrative, multi disciplinary pain medicine built around the needs of the patient. Pain Physician 2008;11:775-84.

- Teets RY, Dahmer S, Scott E. Integrative medicine approach to chronic pain. Prim Care 2010;37:407-21.

- Wang SM, Kain ZN, White P. Acupuncture analgesia. I: The scientific basis. Anesth Analg 2008;106:602-10.

- Han JS. Acupuncture: neuropeptide release produced by electrical stimulation of different frequencies. Trends Neurosci 2003;26:17-22.

- Goldman N, Chen M, Fujita T, et al. Adenosine A1 receptors mediate local anti-nociceptive effects of acupuncture. Nat Neurosci 2010;13:883-8.