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USE OF HERBAL PRODUCTS IN MUSCULOSKELETAL SYSTEM PAIN

KAS İSKELET SİSTEMİ AĞRISINDA BİTKİSEL ÜRÜNLERİN KULLANIMI

Sevil Okan[1], Fatih Okan[2]

[1] Tokat Devlet Hastanesi, Fiziksel Tıp ve Rehabilitasyon Birimi, Türkiye

[2]Tokat Gaziosmanpaşa Üniversitesi, Sağlık Bilimleri Fakültesi, Halk Sağlığı Hemşireliği Bölümü, Türkiye

Yazışma Adresi / Correspondence:
Sevil Okan (e-mail: doctorsevil@yahoo.com)

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Ankara Yıldırım Beyazıt University Faculty of Medicine
Department of Family Medicine

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Öz

Amaç: Kas-iskelet sistemi hastalıkları, eklemleri, kemikleri ve kasları etkileyen ve uzun süreli dizabiliteye neden olan bir hastalık grubudur. Bu çalışmada kas iskelet sistemi ağrısında bitkisel ürünlerin kullanımının incelenmesi amaçlanmıştır.

Materyal ve Metot: Tanımlayıcı kesitsel tipteki çalışmaya Kasım 2019- Ocak 2020 tarihleri arasında polikliniğe kronik kas iskelet sistemi ağrısı nedeniyle başvuran 18 yaş ve üzeri, bir haftadan uzun süre bitkisel ürün kullanımı bildiren ve çalışmaya katılmayı kabul eden 98 birey dahil edildi. Bireylere sosyodemografik özellikler ve bitkisel ürün kullanım durumlarının sorgulandığı araştırmacılar tarafından oluşturulan 26 maddelik soru formu uygulandı.

Bulgular: Çalışmada kas iskelet sistemi ağrısı olan bireylerin bitkisel ürün kullanım sıklığı %7,09 olarak bulundu. Bireylerin en sık kullandığı 6 ürün sırasıyla; %19,38 at kestanesi jeli, %15,30 zeytin yağı, %13,26 bamya tohumu, %10,20 çınar yaprağı, %8,16 ardıç yağı ve %7,14 çörekotu yağı şeklinde tespit edildi. Bireylerin %57,14'ünün (n=56) bitkisel ürün kullanımı sırasında doktoru bilgilendirmeye gerek duymadığı saptandı.

Sonuç: Hastaların kas-iskelet sistemi ağrılarında bitkisel ürün kullanımına başvurdukları açıktır. Tedavi de kullanılacak bitkilerden iyi sonuç elde edebilmek için ürünün uygun doz ve sürelerde, doğru endikasyonlarda, doğru zamanda kullanımı, yan etkileri, ilaç etkileşimleri ile ilgili hastalar bilgilendirilmelidir. Doktor ve sağlık personeline bitkisel ürün kullanımı hakkında bilgi vermeleri konusunda hastalar cesaretlendirilmelidir.

Anahtar Kelimeler: Bitkisel Ürün, Kas İskelet Sistemi, Ağrı

Abstract

Objectives: Musculoskeletal disorders are a group of disorders that affect the joints, bones, and muscles, causing long-term disability**.** The aim of the present study was to examine the usefulness of herbal products in musculoskeletal system pain.

Materials and Methods: This descriptive sectional study included 98 individuals who applied to Outpatient Clinic with chronic musculoskeletal system pain, who were 18 years old and over, who had reported using herbal products for more than a week and who were willing to participate in the study. The individuals were subjected to a 26-item questionnaire form which was prepared by the authors and which questioned sociodemographic characteristics of the participants and their use of herbal products.

Results: It was found that 7.09% of the individuals with musculoskeletal system pain used herbal products. The most common six products used by the individuals in decreasing order were horse chestnut gel (19.38%), olive oil (15.30%), okra seed (13.26%), plane tree leaves (10.20%), juniper oil (8.16%) and black cumin oil (7.14%). Of all individuals, 57.14% of them (n = 56) reported that they did not need to notify physicians about their herbal product use.

Conclusion: It is clear that patients resort to the use of herbal products in musculoskeletal system pain. In order to have better outcomes with the herbal products used in therapy, patients should be informed about the proper dose, duration, indication and time, and side effects and drug interactions of herbal products. Patients should be encouraged about informing their physicians and healthcare providers about their use of herbal products.

Keywords: Herbal Product, Musculoskeletal System, Pain

Introduction

Musculoskeletal system disorders are defined as injuries and ailments involving musculoskeletal system structures such as muscles, tendons, ligaments, discs, etc., and they affect a considerable part of the world population. A population-based study revealed that about 20% of persistent pains of adults are due to musculoskeletal system problems.[1] Musculoskeletal system disorders increase the limitations in daily life activities of individual and increase the disability and frequency of applying to healthcare services.[2] Impressed by common advertisements about many natural products, patients could have an interest in using herbal products for the treatment of these disorders since they believe that use of medicines is not always as effective as they desire, that pharmaceutical therapy has major side effects and that herbal and complementary therapy is more reliable and "natural".[3]

It was reported that 92.9% of geriatric patients in Turkey use drugs without recommendation from their physicians and 89.3% of them prefer herbal methods.[4] A study in the United States, on the other hand, reported that among the self-treatment methods used for pain relieving by individuals, the most common ones were complementary/alternative medicine methods (76%), and frequency of herbal products/supplements was 26%. In the same study, 31% of people reported that they did not inform their physicians about the self-treatment method for pain.[5] The use of herbal treatments along with drugs may raise the possibility of plant-drug interaction problems.[6] The largely uncontrolled use of herbal medicines in most countries can affect product quality, which can cause serious safety problems. It was shown that some Asian herbal mixtures are contaminated with heavy metals in toxic quantities or mixed with synthetic prescription drugs.[7] Despite these negative effects, it was also reported that some herbal medicines may have significant potential in the treatment of musculoskeletal pain.[8] Although herbal products could have positive effects, they may lead to serious health consequences due to the interactions of herbal products with prescription drugs as well as due to interactions between different herbal products and foods especially when the plants which are not studied sufficiently in clinical trials are used in treatment. The present study was designed to determine which herbal products were used by the patients who applied to hospitals with musculoskeletal system complaints and how they were used, to evaluate extent with which patients derived benefits from herbal products, and to reveal whether the patients informed their physicians about their use of herbal products.

Materials and Methods

The study population of this descriptive-sectional study was 1,381 individuals who applied to Physical Medicine and Rehabilitation Outpatient Clinic of Tokat State Hospital with chronic musculoskeletal system pain in November 2019-January 2020 period. The sample of the study, on the other hand, was 98 individuals who were 18 years old or over during the time when the study was carried out, who had been suffering from

musculoskeletal system pain for more than three months, who reported to use herbal products for more than a week and who were willing to participate in the study. The individuals with psychiatric disease, advanced stage renal or liver failure, inflammatory rheumatism disease and cancer diagnosis were excluded.

For collection of the data, herbal product use of the patients who applied to Physical Medicine and Rehabilitation Outpatient Clinic of Tokat State Hospital with chronic musculoskeletal system pain in November 2019-January 2020 period were searched by the author (SO), a Physical Medicine and Rehabilitation expert. The questionnaire forms of non-literate people who used herbal products were filled by the researcher with a face-to-face interview method. Other individuals were asked to fill the questionnaire forms themselves.

The data collection tool was a 26-question form prepared by the authors based on the literature review, which questioned participants' sociodemographic characteristics, chronic diseases, medications they used, type of herbal plants, method and duration of use of herbal products, experienced side effects during or after herbal product use and informing their physicians about herbal product use.

Approval was taken from Ethical Committee of Tokat Provincial Health Management (Date: 04.04.2018, No: 3394) and Tokat Gaziosmanpaşa University, Clinical Research Ethical Board (19-KAEK-184) stating that there was no ethical or scientific objection for the study. Aim of the study was explained to the individuals constituting the sampling of the study, and their written and verbal consents were taken. The study was conducted in accordance with the principles of Helsinki Declaration.

Statistical Analyses: Statistical analyses of the data were carried out using SPSS software (Version 22.0, SPSS Inc., Chicago, IL, USA). Descriptive statistics were given as mean ± standard deviation for normally distributed continuous variables while continuous variables which did not have normal distribution were given as median (min-max). Frequency distributions of categorical data were reported as number and percentage (%). Normality of the distribution was checked using Shapiro-Wilk test.

Results

Women constituted 88.77% of the participants, and 11.22% were men. Mean age was 53.12 ± 14.02 years. In terms of educational status, primary school graduates were most common (44.89%). Majority of the participants (72.44%) were homemakers. Most participants (77.55%) lived in urban areas, i.e. in provincial or district towns. Median period that the patients suffered from musculoskeletal system pain was 36.00 months (range: 3.00-240.00 months), and median duration for herbal product use was one month (range: 0.25-72.00 months) (Table 1).

The individuals with musculoskeletal system pain reported that as herbal products they used horse chestnut (*Aesculus hippocastanum*) gel most (19.38%), followed by olive (*Olea europaea*) oil (15.30%), okra (*Abelmoschus esculentus*) seed (13.26%), plane tree (*Platanus* spp.) leaves (10.20%), juniper (*Juniperus communis*) oil (8.16%), black cumin (*Nigella sativa*) seed oil (7.14%), stinging nettle (*Urtica dioica*) (4.08%) and cabbage (*Brassica oleracea*) leaf (3.06%). In addition, coconut (*Cocos nucifera*) oil, mint (*Mentha* spp.) oil, st. john's wort (*Hypericum perforatum*) oil and red pepper (*Capsicum annuum*) cream were used by 2% of the participants, and curcumin (*Curcuma longa*), grape (*Vitis vinifera*) seed, almond (*Prunus amygdalus*) oil, lavender (*Lavandula* spp.) oil, pine tree (*Pinus* spp.) tar, argan (*Argania spinosa*) oil, parsley (*Petroselinum crispum*) juice, marigold (*Calendula officinalis*) oil, chestnut (*Castanea* spp.) leaf, tea tree (*Melaleuca alternifolia*) oil and flax (*Linum usitatissimum*) seed were used by 1% of the individuals in the study.

The individuals with gonarthrosis diagnosis in the study used most commonly okra seed (n=13, 31.70%), while the ones with lumbar discopathy used olive oil (n=5, 26.31%), ones with cervical discopathy used plane tree leaves (n=3, 27.27%) and horse chestnut gel (n=3, 27.27%), and ones with myofascial pain syndrome used horse chestnut gel (n=6, 33.33%). The three most commonly used herbal products by the individuals with shoulder impingement syndrome diagnosis were horse chestnut gel, black cumin seed oil and juniper oil (Table 2).

The individuals who used horse chestnut gel most commonly had myofascial pain syndrome diagnosis (n=6, 31.57%), followed by gonarthrosis (n=5, 26.31%), cervical discopathy (n=3, 15.78%), lumbar discopathy (n=3, 15.78%) and shoulder impingement syndrome (n=2, 10.52%).

Olive oil users most commonly had gonarthrosis diagnosis (n=8, 53.33%), followed by lumbar discopathy (n=5, 33.33%), shoulder impingement syndrome (n=1, 6.66%) and myofascial pain syndrome (n=1, 6.66%). Lumbar discopathy and shoulder impingement syndrome diagnoses reported they did not find the product useful.

All okra seed users (n=13) had gonarthrosis diagnosis. Eleven of them (84.61%) reported that they found the product useful.

Two of the seven individuals (28.57%) who used black cumin oil had gonarthrosis diagnosis, two (28.57%) had cervical discopathy, two (28.57%) had shoulder impingement syndrome and one (14.28%) had myofascial pain syndrome.

Three of the individuals (37.50%) who used juniper oil had lumbar discopathy diagnosis, while two (25.00%) had gonarthrosis, two (25.00%) myofascial pain syndrome and one (12.50%) had shoulder impingement syndrome.

Table 1. Descriptive Characteristics of the Participants.

	Number (n)	Percent (%)
Gender		
Female	87	88.77
Male	11	11.22
Education status		
Illiterate	17	17.34
Literate	4	4.08
Primary school graduate	44	44.89
Middle school graduate	11	11.22
High school graduate	9	9.18
College graduate	13	13.26
Employment		
Homemaker	71	72.44
Farmer	3	3.06
Civil servant	18	18.36
Student	1	1.02
Retired	5	5.10
Living place		
Provincial central towns	63	64.28
District towns	13	13.26
Small town	4	4.08
Village	18	18.36
Age (years), Mean ± SD	53.12 ± 14.02	
Duration of the disorder (months), median (min-max)	36.00 (3.00-240.00)	
Duration of herbal product use (months), median (min-max)	1.00 (0.25-72.00)	

Three of the individuals who used plane tree leaves (30.00%) had gonarthrosis diagnosis, three (30.00%) had cervical discopathy, two (20.00%) had myofascial pain syndrome, one (10.00%) had lumbar discopathy and one (10.00%) had shoulder impingement syndrome.

In deciding the herbal product use, individuals used recommendations from their neighbors most (n=42, 42.85%), and for obtaining the product they mostly preferred herbalists (n=56, 57.14%). It was found that 70.40% of the individuals (n=69) in the study used herbal products on the skin, and 71.42% of them (n=70) preferred using it once a day. It was revealed that 22 individuals did not benefit from the use of herbal products. It was understood that 73.46% of individuals (n=72) applied to doctor for musculoskeletal disease before using

herbal products. Fifty-six individuals (57.14%) did not think they needed to inform the doctor during the use of herbal products (Table 3). Reported harmful effects were as follows: stomachache in one individual using okra seed and one individual using juniper oil; skin redness in one individual using juniper oil and one individual using plane tree leaves. It was revealed that during the use of herbal products, four individuals with hypertension, coronary artery disease and hyperthyroidism diagnoses discontinued taking their drugs prescribed by their physicians, while 31 individuals with hypertension, diabetes mellitus, coronary artery disease and hyperthyroidism diagnoses continued taking their drugs along with the herbal products (horse chestnut gel, olive oil, okra seed, plane tree leaves, juniper oil, black cumin seed oil, mint oil, st. john's wort oil and flax seed).

Table 2. Distribution of Herbal Products Used for Musculoskeletal System Pain.

Musculoskeletal System Disorder	**Number (n)**	**Percent (%)**
Gonarthrosis (n=41)		
Okra seed	13	31.70
Olive oil	8	19.51
Horse chestnut gel	5	12.19
Lumbar discopathy (n=19)		
Olive oil	5	26.31
Horse chestnut gel	3	15.78
Juniper oil	3	15.78
Myofascial Pain Syndrome (n=18)		
Horse chestnut gel	6	33.33
Juniper oil	2	11.11
Plane tree leaves	2	11.11
Cervical discopathy (n=11)		
Plane tree leaves	3	27.27
Horse chestnut gel	3	27.27
Black cumin oil	2	18.18
Shoulder impingement syndrome (n=9)		
Horse chestnut gel	2	22.22
Black cumin oil	2	22.22
Juniper oil	2	22.22

Three most commonly used herbal products were listed.

Table 3. Characteristic of Herbal Product Use

	Number (n)	Percent (%)
Herbal Product Recommendation		
Physician/Healthcare Professional/Pharmacist	4	4.08
Neighbors	42	42.85
Relatives	29	29.59
Media	23	23.46
Place of Obtaining Herbal Product		
Supermarket	9	9.18
Herbalist	56	57.14
Bazaar	9	9.18
Internet	19	19.38
Own garden	5	5.10
Form of Herbal Product Use		
Oral	29	29.59
Topical	69	70.40
Frequency of Using Herbal Product		
When pain is present	12	12.24
Once a day	70	71.42
Twice a day	13	13.26
Every other day	3	3.06
Consulting A Physician Before Using Herbal Product		
Yes	72	73.46
No	26	26.53
Deriving Benefits from Herbal Product		
I benefitted very much	19	19.38
I benefitted	36	36.73
I benefitted some	17	17.34
I did not benefit	22	22.44
Harm due to herbal product		
Yes	4	4.08
No	94	95.91
Use of medicine along with the herbal product		
Yes	64	65.30
No	34	34.69
Reason for not informing physician about herbal product use		
Consulted	6	6.12
I did not think I needed to	56	57.14
Herbal products have no harms	10	10.20
I was afraid of his/her reaction	9	9.18
Physician did not ask	17	17.34

Discussion

Since herbal treatments are cheaper and more beneficial, and have less side effects than other treatment methods, they are considered to be among the traditional treatment methods used from the past to the present. [9]Traditional use implies that although there is not enough evidence of clinical trials, herbal medicines are safely used for a long time (at least 30 years in general and at least 15 years in the European Union) and there is evidence that it is effective. It was reported that medical supervision is not required for the intended use. [10]It was found in the present study that 7.09% of individuals with musculoskeletal system pain used herbal products. There has been no study in the literature evaluating the only herbal product use in musculoskeletal diseases. Frequency of herbal product use was found to be 10.96% by Kavadar et al.[11] in a sectional study. Higher herbal product use report in the literature compared to the present study could be due to the fact that herbal products were not considered together with food supplement products in the present study.

Six most commonly used herbal products for musculoskeletal pain by the patients in the present study were horse chestnut gel (19.38%), olive oil (15.30%), okra seed (13.26%), plane tree leaves (10.20%), juniper oil (8.16%) and black cumin oil (7.14%).

It was revealed in the present study that the individuals used horse chestnut for all of the musculoskeletal pain evaluated. In a multicentered randomized double-blind controlled study, topical preparations containing aescin (the main active ingredient of horse chestnut seed) was found to produce a faster analgesic effect on strain, sprain or contusion compared to placebo.[12] It was reported that use of horse chestnut seed extract reduced leg pain and swelling in chronic venous insufficiency and therefore was effective and safe in short-term treatment.[13] According to the European Medicines Agency monograph, horse chestnuts are traditionally used to treat leg pain and edema in chronic venous insufficiency. [14] But in the present study, patients used this product for other indications. No side effects were reported by the individuals using this herbal product. However, it was reported in the literature that commercial topical products containing horse chestnuts contained aflatoxins, substances considered to be strong carcinogens.[15]

Individuals with gonarthrosis and lumbar discopathy in the study were found to frequently use topical olive oil. The Commission E-monograph stated that olive oil has cholecystokinetic properties but did not mention its use in gonarthrosis and lumbar discopathy . [16] In a randomized double-blind clinical study evaluating the effect of olive oil in osteoarthritis, virgin olive oil was topically applied three times a day in the treatment group (n= 30) while the control group (n=30) had 1 g piroxicam gel (0.5%) application. Both topical piroxicam and olive oil reduced the pain subscale scores of Western Ontario and McMaster Universities Osteoarthritis Index

(WOMAC), and effect of olive oil became superior to piroxicam two weeks after the start of the treatment.[17] A study with women athletes suffering from lower back pain found that use of pure olive oil in combination with phonophoresis healed lower back pain, and this effect was better than what was achieved by ultrasound use.[18] Thus, the finding that most of the individuals with lower back pain and gonarthrosis used olive oil in the present study was in accordance with the findings in the literature.

In the present study, all individuals who used okra seeds had gonarthrosis diagnosis. In animal experiments made with methanol extract of okra roots, scientific evidence was found for the use of this species in traditional medicine especially for central nerve system disorders and pain. However, it was mentioned that additional pharmacological research was needed to better understand the effect type on central nerve system and pain inhibition mechanism.[19] Studies in the literature dealing with the effect of okra seed on musculoskeletal system are limited to animal experiments. More advanced studies are needed to support its effects on humans.

Plane tree leaves were reported to be used in Iranian traditional medicine for knee pain and were found effective in decreasing knee edema.[20] In animal study, plane tree leaves were found to have moderate analgesic effects.[21] In another study, it was suggested that when collected at appropriate time and region, plane tree leaves could be used for osteoarthritis.[22]

The individuals with gonarthrosis, myofascial pain syndrome, lumbar discopathy and shoulder impingement syndrome diagnoses in the present study reported using juniper oil. The Commission E-monograph stated that juniper oil is used for the treatment of dyspepsia.[16] Juniper oil is also known to be used in the treatment of joint pain and rheumatism.[23] It was proven in an animal experiment that this plant exhibits considerable activity as an antinociceptive agent and acts both peripherally and centrally.[24] In another study, it was concluded that the methanol extract of juniper oil had beneficial anti-arthritic activity at doses of 20 and 40 mg/kg.[25] An individual in the present study who preferred using juniper oil orally ended the use due to stomach pain. It was reported in the literature that long term use of juniper oil could lead to diarrhea, bowel and kidney pain, blood in urine and/or purple colored urine or tachycardia, while epidermal contact with juniper tar could lead to carcinogenic DNA damage in human tissues.[26]

In the present study, 57.14% of the patients reported to benefit from black cumin seed. It was reported in a review study evaluating the therapeutic effect of black cumin that this herbal product has antibacterial, antioxidant, antidiabetic and analgesic effects, and that it could also have anticarcinogenic effect and regulative effect on immune system.[27] Kooshki et al. [28] reported that pain was significantly decreased in elder patients with knee osteoarthritis who used black cumin oil three times a day for three weeks compared to the ones who did not use.

One individual who used okra seed and one individual who used juniper oil in the present study reported stomachache while redness in skin was reported by one individual who used plane tree leaves and one individual who used juniper oil. It was reported in the literature that herbal products could directly result in toxic effects, allergic reactions, contamination-dependent effects, interactions with other medicines and herbal products (herbal product – drug, herbal product – organ, etc.). [29] It was found that four individuals with chronic disease (hypertension, coronary artery disease and hypothyroidism) stopped using their medicines during their use of herbal products whereas 31 individuals (31.63%) with chronic diseases (hypertension, diabetes mellitus, coronary artery disease, hypothyroidism) continued using their drugs along with the herbal products (horse chestnut gel, olive oil, okra seed, plane tree seed, juniper oil, black cumin oil, mint oil, st. john's wort oil and flax seed). Herbal products, which are considered to be non-toxic since they are natural, could produce harmful effects in elderly individuals who use multiple drugs. They could also lower the efficiency of the main therapy and lead to exaggeration in the expected therapeutic response. [30] The lack of standardization in the production of herbal products is another problem. The content and hygiene of the products used is unknown. Fungi such as Aspergillus and Fusarium were detected in herbal medicines imported from India and Sri Lanka. Besides, heavy metal contaminations were observed in Asian herbal remedies, especially in ayurvedic mixtures. Non-steroidal anti-inflammatory drugs and benzodiazepines were found in Chinese-origin herbal mixtures imported from Hong Kong and Taiwan.[31] Therefore, herbal products should be obtained from the appropriate suppliers, and herbal product use should be questioned by physicians to prevent possible drug interactions. In addition, dried parts (root, shell, seeds, leaves, flowers, etc.) usually maintain their pharmaceutical properties for one year. Therefore, plant parts collected more than one year ago should not be used for treatment purposes. In addition, plant parts should not be used for more than 4-6 weeks if not specifically specified. [32]

It was revealed that 93.88% of the individuals had not informed their physicians about their using of herbal products. Their reasons for doing so were that they did not think they needed to do so, they thought herbal products were not harmful, they were afraid of physician's response and the physician did not ask about it. It was reported in another study that most participants similarly did not inform their healthcare providers about their use of herbal therapy methods.[33] Many side effects and interactions occur due to the use of herbal products without consulting physicians. Especially in elderly individuals, physiological functions are impaired, causing negative morbidity and mortality outcomes.[34] Therefore, it was reported that gaining information through asking the patients whether they use complementary and alternative treatment methods and whether they know about the interactions of herbal products they use with drugs, and providing consultation for them could reduce some possible risks.[35] In order to prevent undesirable side effects and failures in treatment of patients, it is crucial to inform patients and make them behave more openly about telling the herbal products they use.

In conclusion, it is clear that patients resort to the use of herbal products in musculoskeletal system pain. The three most commonly used products by the patients were horse chestnut gel, olive oil and okra seed. Stomachache was observed in one individual using okra seed and one individual using juniper oil. In addition, one individual using juniper oil and one individual using plane tree leaves had skin redness. Only 6.12% of patients were found to have informed their physicians for herbal product use. In order to achieve better outcomes with herbal products in treatment, physicians should increase their knowledge about this issue through evaluating the scientific literature, and they should question the herbal product use in patients' anamnesis. In addition, patients should be informed about the correct dose, duration, indication and timing of the use, side effects and drug interactions of the herbal products. Patients should be encouraged to inform their healthcare providers about their use of herbal products.

Controlling the unlimited use of herbal medicines is very important both in Turkey and around the world. Advanced scientific studies should be carried out to evaluate the use of herbal products and their effects on health. Thus, these products could be safely used in common musculoskeletal system pain.

Conflicting interest: The authors declare that they have no conflict of interest.

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