



Physiotherapeutic interventions in patients with migraines

Received: 14-07-2015

Piejko L

Accepted: 01-12-2016

Published: 22-07-2017

Doctoral course, Jerzy Kukuczka Academy of Physical Education in Katowice, Poland, Faculty of Physiotherapy, Chair of Physiotherapy in Diseases of Internal Organs

Abstract

Migraine headaches represent one of the most frequent chronic problems which significantly impact on the limitation of everyday human functioning. Despite pharmacological treatment, many people also need preventive care to reduce intensity of the symptoms of the disease, reduce frequency of migraine attack and to enhance the response to the abortive treatment. New strategies of combining pharmacological and non-pharmacological treatment have been demonstrated to be as effective as taking modern medicines. Unfortunately, the awareness of availability and effectiveness of non-pharmacological methods to treat migraines remains to be insufficient. Therefore, the need arises for educating medical staffs and patients and continuation of the research in this field of science. The study presents a brief characterization of the disease, discusses non-pharmacological methods to treat migraines and proposes the guidelines for physiotherapists to be used in the clinical practice.

Keywords:

headache, prevention, physical activity

Word count: 1555

Tables:

Figures:

References: 47

Corresponding author

Laura Piejko

e-mail: laura.piejko@gmail.com

INTRODUCTION

Migraine is a chronic disease with recurrent attacks of headaches, often associated with nausea and increased sensitivity to external stimuli (Linde 2008). Headache intensity can be moderate to severe, with various durations (from hours to several days) while associated symptoms may include sensitivity to noise, photophobia, nausea and/or vomiting (Schramm et al. 2013). The condition is more prevalent in female patients (Rasmussen & Stewart 2000, Dahlof & Linde 2001), with incidence rate reaching 6-9% per year in the population of men and 15-17% in the population of women (Linde 2008).

Despite numerous studies, etiopathogenesis of migraine headaches is not fully known (Zgorzalewicz 2005). Migraines are believed to be caused by genetic tendencies for supersensitive neurovascular reactions. Migraine headaches are claimed to be linked to stimulation of the brain stem. The underlying mechanisms may include improper function of cortical receptors, neurons that control cerebral blood flow, blood dust and macrophages, which stimulate the perivascular nervous tissue and contribute to their hyperactivity (Zgorzalewicz 2005).

The migraine triggers may include e.g. loud sounds, specific smell and perfumes, bright light (including sunlight), cigarette smoke, stress and consumption of alcohol after a stressful day, natural hormonal fluctuations in women in the menstrual cycle and some foods such as dairy products, chocolate, nuts, citrus fruit, avocado, aspartame and monosodium glutamate (tinned fish, instant foods, sauces and seasonings) (Lipton et al. 1989, Schramm et al. 2013, MedlinePlus).

The risk factors in migraines are sex (female), previous cases of migraines in family, painkiller abuse, multiple sclerosis, and obesity (Scher et al. 2003, Schramm et al. 2013, MedlinePlus).

FORMS OF THE DISEASE AND CLINICAL SYMPTOMS

The most frequent form of migraine headaches occurs without aura. Headaches affect one half of the head while their duration ranges from 4 to 72 hours and can be pulsating in nature. Patients may often feel throbbing coinciding with heartbeat, both at rest and during exercise, which may make the pain worse. Additional symptoms such as nausea, phonophobia and photophobia are relatively rare (Linde 2008, Levin 2013).

Migraine headaches may occur with or without aura. Aura is defined as a group of neurological symptoms experienced before migraine attacks. However, the literature shows that aura can occur immediately before, during or, in an insignificant percentage of cases, after the phase of headache begins. One of the typical characteristics of aura is focal symptoms which are fully reversible. These include

nausea, vomiting, disturbances in vision, sensation, motor activity, balance or speech, developing gradually over 5 to 20 minutes and taking not longer than an hour (Russell & Olesen 1996, Eriksen et al. 2004).

Linde (2008) isolated five phases of a migraine attack: (1) prodrome phase, (2) aura phase, (3) pain phase, (4) postdrome phase, and (5) post-attack phase. However, all the phases may not appear during an attack and the boundaries between individual phases (except for aura) can be blurred. The literature shows that over half of patients (59-63%) experience the prodrome phase and can predict the migraine attack for several hours or days before it occurs.

The prodromal symptoms that are observed before a migraine attack include emotional exhaustion, disturbances of concentration, recurring yawning, specific cravings for certain tastes and foods and a sensation of neck stiffness (Giffin et al. 2003, Kelman 2004, Schoonman et al. 2006).

TREATMENT AND NON-PHARMACOLOGICAL PREVENTION OF MIGRAINES

Treatment of migraines involves pharmacological procedures, which is aimed at stopping the attack, and preventive treatment. The attempts are made to reduce pain, reduce intensity of the symptoms and helping patients to regain everyday social functioning.

Nonsteroidal anti-inflammatory drugs, non-selective and selective specific antimigraine drugs, antiemetics and sedatives are used in the pharmacological treatment. In the case of low effectiveness of pharmacological treatment, several non-pharmacological interventions are recommended in all the patients who need prevention, both in monotherapy and combined with taking drugs (Linde 2008).

Often pharmacological treatment is not well tolerated by patients due to coexistence of unfavourable and unwanted symptoms (Totzeck et al. 2012). Furthermore, migraine is often an undiagnosed medical condition which is either insufficiently treated or untreated. The literature indicates that only every third person with migraine uses medical services (Linde 2008, Rutberg 2013). Furthermore, many researchers (Cottrell et al. 2002, Belam et al. 2005, Moloney et al. 2006, Rutberg 2013) found that patients with chronic migraines do not always receive sufficient attention of the medical professionals while the symptoms of the disease are often neglected. This makes patients seek non-pharmacological methods to treat the disease (Gaul et al. 2009, Totzeck et al. 2012).

One of the methods is physiotherapeutic procedures and regular physical exercise (Darling 1991, Locket & Campbell 1992, Lemstra et al. 2002, Kosegolu et al. 2003, Narin et al. 2003, Osun & Pinar 2003, Busch & Gaul 2008, Dittrich et al. 2008, Varkey et al. 2009, 2011, Darabeanu et al. 2011, Gaul et al. 2011).

In a randomized clinical study, Lemstra et al. (2002) demonstrated that therapeutic procedures conducted by a neurologist and physiotherapist yielded better effectiveness in patients with migraines compared to a conventional therapy prescribed by family doctors. The participants of the study were 80 women and men randomly divided into subgroups. In the subgroups, the participants performed exercises of relaxation and coping with stress, kinesiotherapy, series of massage sessions and lectures on nutrition. In the control group, the participants received the conventional therapy by a family doctor. The patients from the study group reported a statistically significant ($p=0.000$) reduction in the frequency and intensity of pain episodes, better quality of life, functional fitness and lower depression compared to the control group. Furthermore, the patients gave priority to the group exercise sessions and physiotherapist consultations.

In another study, Varkey et al. (2009, 2011) demonstrated that physical exercises (indoor cycling, relaxation training and rehabilitation exercises) represent an effective and recommended method of migraine prevention among patients who do not want or do not tolerate a standard pharmacological treatment.

Similar results concerning a reduction of subjective pain syndromes and depression were obtained by Dittrich et al. (2008) in patients with migraines subjected to a 9-week therapy composed of 45-minute physical exercise and 15-minute relaxation training and Narin et al. (2003) in patients following a 60-minute sessions of general fitness exercises. Furthermore, a 10-week running training (Darabaneanu et al. 2011) was also significantly effective ($p=0.028$) in reduction of the number of days with migraine attacks a month and reduction of stress symptoms in patients compared to the control group that was not subjected to training.

The improvement in the clinical status of patients was also observed following yoga programs (John et al. 2007, Kisan et al. 2014) and acupuncture (Linde et al. 2009).

Other physiotherapy methods used to treat patients with migraines are massages and spinal manual therapy. However, few reports have shown the effectiveness of these methods. Therefore, it is recommended to carefully consider their usefulness for a specific patient.

The effects of massage on reduction in migraine symptoms were evaluated by Lawler and Cameron (2006) in a randomized clinical study. The patients were subjected to 45-minute ($n=47$) massage sessions once a week for 13 weeks. Compared to the control group, a significant reduction in migraine symptoms, improved quality of sleep, lower stress and cortisol levels were observed.

Studies also documented the effects of electrical stimulation (ENS) (Penini & DeBoni 2012), techniques of spinal manual therapy (Astin & Ernst 2002, Fernandez-de-las-Penas et al. 2006, Chaibi et al. 2011),

chiropractic (Tuchin et al. 2000, Davis 2003) and osteopathy (Voigt et al. 2011).

In a review of complementary and alternative methods of migraine treatment (Gantenbein 2012), the author demonstrated a significant effectiveness of the rehabilitation exercises, relaxation training and biofeedback methods in prevention of migraines. However, the effectiveness of homoeopathy, hypnosis, herbal medicine, vitamin supplements and spinal manipulation has not been supported by unequivocal evidence.

Scientific non-pharmacological methods of prevention of migraine attacks, with particular focus on kinesiotherapy appears to be significantly useful in combating the disorder. Since a double-blind clinical trial is impossible, the problem of accurate and reliable evaluation of their effectiveness remains open to question.

GUIDELINES FOR PHYSIOTHERAPISTS IN THE CLINICAL WORK

1. Patients may complain about the deterioration of everyday functioning, also in the period between migraine attacks. This fact should be taken into account during planning of rehabilitation.
2. The focus should be on any symptoms of distraction, chronic fatigue or drowsiness.
3. Potential migraine triggers should be avoided during the exercise (bright light, sounds, smell).
4. Patients with chronic migraine headaches are in the group of fall risk. The program of exercise should take into account training of falls, proprioception and balance.
5. No evidence has been presented to support the effectiveness of resistance training.
6. The recommendations for the physical exercise are consistent with general training guidelines of the American College of Sports Medicine (ACSM 2006):
 - Exercise with intensity of 60-65% HRmax or 11-13 on the Borg scale (light, not too high),
 - The endurance training is recommended, e.g. on a treadmill, cycle ergometer, Nordic walking, general fitness exercises, relaxation training, functional training,
 - Number of training sessions: maximal 3 to 4 times a week,
 - Duration of a session: from 20 to 60 minutes.

Red flags (Hainer & Matherson 2013):

- intensification of neurological problems (disturbances of vision, walking, balance, blood pressure spikes),
- personality disorders,
- occurrence of the strongest migraine attack to date,
- intensification of the symptoms during or each time after the exercises,
- intensifying neck stiffness.

REFERENCES

1. American College of Sports Medicine. ACSM's Guidelines for Exercise Testing and Prescription. 6th ed. Philadelphia, LW&W; 2006
2. Astin JA, Ernst E. The effectiveness of spinal manipulation for the treatment of headache disorders: a systematic review of randomized clinical trials. *Cephalalgia*, 2002;22(8):617-623
3. Belam J, Harris G, Kernick D, et al. A qualitative study of migraine involving patient researchers. *Br J Gen Pract*. 2005;55:87-93
4. Busch V, Gaul C. Exercise in migraine therapy - is there any evidence for efficacy? A critical review. *Headach*, 2008, 48:890-899
5. Chaibi A, Tuchin PJ, Russell MB. Manual therapies for migraine: a systematic review. *J Headache Pain*, 2011;12(2):127-133
6. Cottrell C, Drew J, Waller S, et al. Perceptions and needs of patients with migraine: a focus group study. *J Fam Pract*. 2002;51:142-7
7. Dahlof C, Linde M. One-year prevalence of migraine in Sweden: a population- based study in adults. *Cephalalgia* 2001; 21: 664-671
8. Darling M. Exercise and migraine. *J. Sports Med. Phys Fitness*, 1991; 31:294-302
9. Davis RC. Chronic migraine and chiropractic rehabilitation: a case report. *J Chiropr Med*, 2003;2(2):55-59
10. Dittrich SM, Gunther V, Franz G, et al. Aerobic exercise with relaxation: influence on pain and psychological well-being in female migraine patients. *Clin J Sport Med*, 2008; 18:363-5
11. Eriksen M, Thomsen L, Andersen I, Nazim F, Olesen J. Clinical characteristics of 362 patients with familial migraine with aura. *Cephalalgia*,2004; 24: 564-575
12. Fernandez-de-las-Penas C, Alonso-Blanco C, San-Roman J, et al. Methodological quality of randomized controlled trials of spinal manipulation and mobilization in tension-type headache, migraine, and cervicogenic headache. *J Orthop Sports Phys Ther*, 2006;36(3):160-169
13. Gantenbein AR, Afra J, Jenni W, Sandor PS. Complementary and alternative treatments for migraine. *Tech Reg Anesth Pain Manag*, 2012;16(1):76-81
14. Gaul C, Eismann R, Schmidt T, et al. Use of complementary and alternative medicine in patients suffering from primary headache disorders. *Cephalalgia*, 2009; 29:1069-1078
15. Gaul C, Van Doorn C, Webering N, et al. Clinical outcome of a headache-specific multidisciplinary treatment program and adherence to treatment recommendations in a tertiary headache center: an observational study. *J Headache Pain*, 2011, 12:475-483
16. Giffin N, Ruggiero L, Lipton R, et al. Premonitory symptoms in migraine. An electronic diary study. *Neurology*, 2003; 60: 935-940
17. Hainer BL, Matheson EM. Approach to acute headache in adults. *Am Fam Physician*, 2013; 87(10):682-687
18. John PJ, Sharma N, Sharma CM, et al. Effectiveness of yoga therapy in the treatment of migraine without aura: a randomized controlled trial. *Headach*, 2007;47(5):654-661
19. Kelman L. The premonitory symptoms (prodrome): a tertiary care study of 893 migraineurs. *Headach*, 2004; 44: 865-872
20. Kisan R, Sujan M, Adoor M, et al. Effect of Yoga on migraine: A comprehensive study using clinical profile and cardiac autonomic functions. *Int J Yoga*, 2014;7(2):126-132
21. Koseoglu E, Akboyraz A, Soyuer E, et al. Aerobic exercise and plasma beta-endorphin levels in patients with migrainous headache without aura. *Cephalalgia*, 2003; 23: 972-976
22. Lawler SP, Cameron LD. A randomized, controlled trial of massage therapy as a treatment for migraine. *Ann Behav Med*. 2006; 32(1):50-59
23. Lemstra M, Stewart B, Olszynski W. Effectiveness of multidisciplinary intervention in the treatment of migraine: a randomized clinical trial. *Headach*,2002; 42: 845-854
24. Levin M. The International Classification of Headache Disorders, 3rd Edition (ICHD III) - Changes and Challenges. *Headach*, 2013;53(8):1383-1395
25. Linde K, Allais G, Brinkhaus B, et al. Acupuncture for migraine prophylaxis. *Cochrane D Syst Rev*, 2009;(1): CD001218
26. Linde M. Migrena: współczesne kierunki leczenia. *Pol Prz Neurol*, 2008; (4): C1-C13
27. Lipton RB, Newman LC, Cohen JS, et al. Aspartame as a Dietary Trigger of Headache. *Headach*, 1989, 29: 90-92
28. Locket D, Campbell J. The effects of aerobic exercise on migraine. *Headache*, 1992; 32: 50-54.
29. Łukasik M, Owecki M.K, Kozubski W. Leczenie doraźne i profilaktyka napadów migreny. *Neuropsychiatr Neuropsychol*, 2012; 7, 1: 7-18

30. Migrena. MedlinePlus Medical Encyclopedia. Encyklopedia Amerykańskiego Narodowego Instytutu Zdrowia (NIH). <http://www.nlm.nih.gov/medlineplus/ency/article/000709.htm>
31. Moloney MF, Strickland OL, DeRossett SE, et al. The experiences of midlife women with migraines. *J Nurs Scholarsh*, 2006;38:278-85
32. Narin SO, Pinar L, Erbas D, et al. The effects of exercise and exercise-related changes in blood nitric oxide level on migraine headache. *Clin Rehabil*, 2003;17(6):624-630
33. Osun NS, Pinar L. The effects of exercise and exerciserelated changes in blood nitric oxide level on migraine headache. *Clin. Rehabil*, 2003; 17: 624-630
34. Penini F, DeBoni A. Peripheral modulation in chronic migraine. *Neurol. Sci*, 2012; 23:S29-S31.
35. Rasmussen B, Stewart W. Epidemiology of migraine. [in:] Olesen J, Tfelt-Hansen P, Welch K. The headaches. 2nd edn. *LW&W*, 2000: 227-233
36. Russell M, Olesen J. A nosographic analysis of the migraine aura in a general population. *Brain*, 1996; 119: 355-361
37. Rutberg S, Kostenius C, Ohrling K. Professional tools and a personal touch – experiences of physical therapy of persons with migraine. *Disabil Rehabil*. 2013;35(19):1614-1621
38. Scher AI, Stewart WF, Ricci JA, Lipton RB. Factors associated with the onset and remission of chronic daily headache in a population-based study. *Pain*, 2003; 106:81-89
39. Schoonman GG, Ssндor PS, Agosti RM, et al. Normobaric Hypoxia and Nitroglycerin as Trigger Factors for Migraine. *Cephalalgia*, 2006;26(7):816-9
40. Schramm SH, Obermann M, Katsarava Z, et al. Epidemiological profiles of patients with chronic migraine and chronic tension-type headache. *J Headache Pain*, 2013;14(1):40
41. Totzeck A, Unverzagt S, Bak M, et al. Aerobic endurance training versus relaxation training in patients with migraine (ARMIG): study protocol for a randomized controlled trial. *Trials*, 2012; 13:46
42. Tuchin PJ, Pollard H, Bonello R. A randomized controlled trial of chiropractic spinal manipulative therapy for migraine. *J Manipulative Physiol Ther*, 2000;23(2):91-95
43. Varkey E, Cider A, Carlsson J, et al. A study to evaluate the feasibility of an aerobic exercise program in patients with migraine. *Headach*, 2009; 49:563-70
44. Varkey E, Cider A, Carlsson J, et al. Exercise as migraine prophylaxis: a randomized study using relaxation and topiramate as controls. *Cephalalgia*, 2011; 31:1428-38
45. Varkey E, Cider Å, Carlsson J, et al. Exercise as migraine prophylaxis: A randomized study using relaxation and topiramate as controls. *Cephalalgia*, 2011; 31(14):1428-1438.
46. Voigt K, Liebnitzky J, Burmeister U. Efficacy of osteopathic manipulative treatment of female patients with migraine: results of a randomized controlled trial. *J Altern Complement Med*, 2011;17(3):225-230
47. Zgorzalewicz M. Patomechanizm migrenowych bólów głowy. *Neurol Dziec*, 2005; 14, 28: 7-14