

PHYSICAL EXERCISES AND AURICULAR ACUPUNCTURE IN ADDICTION

A. GHEORGHIU¹

P. McDANIEL²

Abstract: *Through this work we are highlighting primary interventions which may help those struggling with substance abuse problems. Romania and Ireland have many issues in common, one of these issues is chemical substance abuse.*

In DSM-III-R, "psychoactive substance abuse" is defined as "a maladaptive pattern of use indicated by continued use despite knowledge of having a persistent or recurrent social, occupational, psychological or physical problem that is caused or exacerbated by the use [or by] recurrent use in situations in which it is physically hazardous".

Keywords: *addiction, physical exercises, auricular acupuncture.*

1. Introduction

"There is a long history attesting to the use of medications and substances, both prescribed and self administered to reduce distress in victims of Trauma." [1]

Self medication using legal or illegal drugs can help in the reduction and severity of nightmares, flash backs and panic attacks. This is why some people turn to drugs.

The two major different types of dependence are: psychological and physical.

- Psychological dependence is in the mind, we believe that we need whatever substance to cope and it then develops a physical need. In many ways it is more difficult to deal with psychological dependence. You cannot develop physical dependence unless the psychological dependence develops first. For example if you have

a hard day at work and have a drink to relax you, this can turn in to a habit and from a habit in to a psychological dependence.

- Physical dependence refers to a state resulting from chronic use of a drug that has produced tolerance and where negative physical symptoms of withdrawal result from abrupt discontinuation or dosage reduction. Physical dependence can develop from low-dose therapeutic use of certain medications as well as misuse of recreational drugs such as alcohol. The higher the dose used typically the worse the physical dependence and thus the worse the withdrawal symptoms. Withdrawal symptoms can last days, weeks or months or occasionally longer and will vary according to the dose, the type of drug used and the individual person.

¹ Physiotherapist, Direction of Social Services, Braşov.

² Community Health Development Worker, Newlodge Duncairn Community Health Partnership, Belfast.

When the trauma survivor initially experiments with substances, he finds out early which substance can make them feel better and often tries out several types of self medication before finding the substance which helps them to relieve symptoms of trauma. The trauma survivor starts to use the substance which best relieves their symptoms for temporary relief. Harmful dependence is when the substance is used in excess and loss of control occurs while using the substance. Because of tolerance the trauma sufferer needs to use more and more of the substance. This results in a deterioration of self image and the beginning of self-destructive behaviour. The situation then becomes chronic in that the trauma survivor uses substances to feel "normal". There is complete dependence on the substance for everyday living and can eventually lead to substance misuse and ultimately death.

2. Physiological mechanisms of action for physical exercises and acupuncture

Physical exercise leads to the release of certain neurotransmitters in the brain that alleviate pain, both physical and mental. Additionally, it is one of the few ways scientists have found to generate new neurons. Much of the research done in this area has focused on running, but all types of aerobic exercise provide benefits. Although the exact nature of these benefits is still being determined, enough research has been done to provide even skeptics with a motivation to take up exercise. Exercise exerts its effects on the brain through several mechanisms, including neurogenesis, mood enhancement, and endorphin release. [2]

One of the most exciting changes that exercise causes is neurogenesis, or the creation of new neurons. The new neurons are created in the hippocampus, the center

of learning and memory in the brain however the exact mechanism behind this neurogenesis is still being explored. At a cellular level, it is possible that the mild stress generated by exercise stimulates an influx of calcium, which activates transcription factors in existing hippocampus neurons. This reparative effect is particularly relevant to humans because the brain starts to lose nerve tissue beginning at age 30. Aerobic exercise reinforces neural connections by increasing the number of dendrite connections between neurons, creating a denser network, which is then, better able to process and store information. [3]

Another factor to consider is endorphins, the chemicals released by the pituitary gland in response to stress or pain. They bind to opioid receptors in neurons, blocking the release of neurotransmitters and thus interfering with the transmission of pain impulses to the brain. [4] Exercise stimulates the release of endorphins within approximately 30 minutes from the start of activity. These endorphins tend to minimize the discomfort of exercise and are even associated with a feeling of euphoria. There is some uncertainty around the cause of this euphoria since it's not clear if endorphins are directly responsible for it, or if they just block pain and allow the pleasure associated with neurotransmitters such as serotonin and dopamine to be more apparent.

Fortunately, it may be possible to exercise to happiness. It has been shown that physically active people recover from mild depression more quickly, and physical activity is strongly correlated with good mental health as people age. Depression is related to low levels of neurotransmitters like serotonin and norepinephrine. Exercise increases concentrations of these neurotransmitters by stimulating the sympathetic nervous system. [5]

Acupuncture is the procedure of inserting and manipulating needles into various points on the body to relieve pain or for therapeutic purposes. Different variations of acupuncture are practiced and taught throughout the world. Acupuncture has been the subject of active scientific research since the late 20th century, but it remains controversial among conventional medical researchers and clinicians. [6] Many hypotheses have been proposed to address the physiological mechanisms of action of acupuncture. Two of the most important are:

- a. **Gate-control theory of pain and**
- b. **Neurohormonal theory**

a. Gate-control theory of pain

The *gate control theory of pain* proposed that pain perception is not simply a direct result of activating nociceptors, but modulated by interplay between excitation and inhibition of these pain pathways. According to the theory, the gating of pain is controlled by the inhibitory action on the pain pathways. That is, the perception of pain can be altered (gated on or off) by a number of means, via psychology, pharmacology, or physiology. The gate-control theory was developed in neuroscience independent of acupuncture, which later was proposed as a mechanism to account for the hypothesized analgesic action of acupuncture in the brain stem reticular formation.

This leads to the theory of central control of pain gating, i.e., pain blockade at the brain (i.e., central to the brain rather than at the spinal cord or periphery) via the release of endogenous opioid neurohormones, such as the endogenous opioid-binding polypeptides, classified as either endorphins or enkephalins.

b. Neurohormonal theory

Pain transmission can also be modulated at many other levels in the brain along the pain pathways, including the periaqueductal gray, thalamus, and the feedback pathways from the cerebral cortex back to the thalamus. Pain blockade at these brain locations is often mediated by neurohormones, especially those that bind to the opioid receptors (pain-blockade site).

Some studies suggest that the analgesic action of acupuncture is associated with the release of natural endorphins in the brain. Furthermore, there is a large overlap between the nervous system and acupuncture trigger points (points of maximum tenderness) in myofascial pain syndrome.

Recently, acupuncture has been shown to increase the nitric oxide levels in treated regions, resulting in increased local blood circulation. Effects on local inflammation and ischemia have also been reported.

3. Physical exercises in addiction

It is known for a long time that the physical exercise it's a way to enhance our physical and psychological condition. This idea is sustain now by a big number of studies witch prove the benefits of regular vigorous exercises. Cross-sectional studies reveal that, compared with sedentary individuals, active persons are more likely to be better adjusted, to perform better on cognitive tests, to exhibit reduced cardiovascular responses to stress, and to report fewer symptoms of anxiety and depression. This are dramatically improving our cardiovascular endurance, allowing us to release stresses from our bodies and promoting increased vitality and well being. Longitudinal studies have

also documented significant improvement in psychological functioning. Exercise training reduces depression, improves self-confidence and self-esteem.

A particular important study was performed in Canada and it focused on alcoholics completing residential treatment. A fitness program, consisting of 1 hour of progressively more vigorous aerobic exercise 5 days a week, was administered to 58 residents of an inpatient alcoholism treatment centre for the full 6 weeks of their treatment. Although study subjects had a very low baseline fitness level, their fitness improved at the same rate expected for non-alcoholics: body fat decreased, basal heart rate decreased, and maximum oxygen uptake increased. These measures remained the same, however, in study subjects who participated only partially in the fitness programs and in residents of another treatment centre that had no fitness program.

At a 3-month follow-up, abstinence rates were 38% for residents before the fitness program was offered, 69.3% for residents during the time that the fitness program was offered, and 36.9% for residents of other treatment centres. [7]

Running, brisk walking and other forms of vigorous exercise help fill the void that occurs in early treatment when use of alcohol and drugs is discontinued, while at the same time contributing to marked improvements in self-esteem, vitality and alertness. These health conducive activities clearly meet the criteria of “positive addiction” set forth by the leading edge psychiatrist Dr. William Glasser. Significantly, vigorous exercise contributes to production of endorphins, precipitating the so-called “runner’s high”.

Endorphins are chemicals produced in the brain, which bind with neuro-receptors

to give relief from pain. Discovered in 1975, endorphins are believed to: enhance the immune system, reduce stress, and delay the aging process. Exercises stimulate the release of endorphins, sending these chemicals through the body. The quantity of endorphins varies from person to person and it’s associated with the second wind - chemical messengers that trigger the pleasure centre of the brain. Furthermore, experiments on rats suggest that frequent exercise may reverse alcohol-induced brain damage. Fulton Crews, Ph.D., a professor of pharmacology and psychiatry and director of the Bowles Centre for Alcohol Studies at the University of North Carolina at Chapel Hill performed an experiment with three groups of rats. One group drank alcohol, but got no exercise. A second drank water and exercised.

“The third drank huge amounts of alcohol and also ran huge amounts,” said Crews. The sedentary, alcoholic rats lost neurons, but running increased neurogenesis equally in both the water-drinking rats and the exercising, alcoholic animals, he said. Perhaps an exercise regimen could reverse neurodegeneration, improve executive function, and help alcoholics along the path to recovery.

“Therapists should challenge their patients to engage in vigorous physical exercise and see if it helps recovery,” he said. [8]

Physical exercise is unequivocally one of the most important components of charting one’s pathway to optimal health. And engaging in regular exercise also offers tremendous benefits in the realm of relapse prevention and long term sobriety maintenance. This combined with the benefits of auricular acupuncture will help fighting with substance abuse problems.

4. Auricular acupuncture in addiction

In the Newlodge Duncairn Community Health Partnership in Belfast auricular acupuncture has been used very successfully to help people with addiction problems.

Auricular acupuncture treats the whole person, body, mind, emotions and spirit. Auricular Acupuncture helps headaches, body aches, sweats, sleep disturbances, tremors, anxiety, depression, mental clarity, decreases anger and reduces cravings for alcohol and other drugs. It stimulates the body to heal itself.

In the mid-1970s, Michael Smith, a medical doctor at Lincoln Hospital in the South Bronx area of New York, modified an existing system of auricular acupuncture into a simple technique for the treatment of many common drug addictions as an alternative to methadone. This selection of ear points proved to be extremely effective in the treatment of addictions, and became what is now referred to as the "NADA protocol." NADA is the acronym for the National Acupuncture Detoxification Association. NADA was founded in 1985 by Dr. Smith and others who were interested in promoting the integration of the protocol in the treatment of addiction. [9]

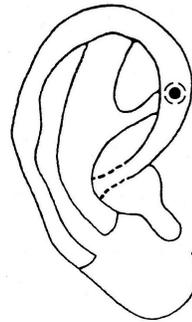
The NADA protocol as it exists today consists of the insertion of small, stainless-steel, disposable acupuncture needles into five points on the outer surface of a person's ear. The points used in the NADA protocol are Sympathetic, *Shen Men*, Kidney, Liver, and Lung.

5. The NADA protocol

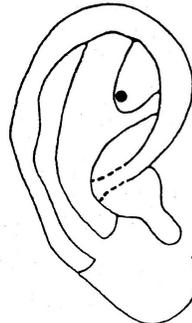
The five points are easy to locate on the surface of the ear. It is important to remember that while these are specific energy points, that there is an area that is active and will elicit the desired response when needed.

Anatomical location

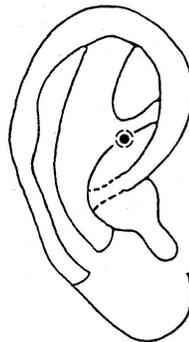
Sympathetic point: to locate using the needle as a pointer, follow the line of inferior anti helix crus under the rim of the helix. The needle should be parallel to ridge itself.



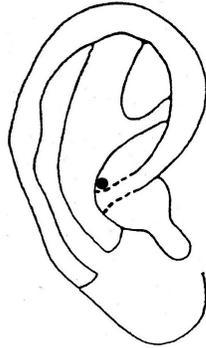
Shen men: lies on the edge of the triangular fossa at the „pointiest” end.



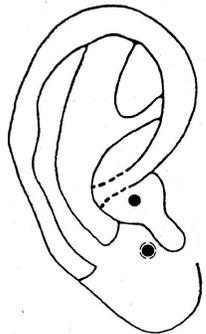
Kidney: lies within the cyma concha directly below shen men under the ridge of the inferior antihelix crus. One method of positioning the needle is with the handle hanging down like a bat in a cave.



Liver: the location can be found by following the crus of the helix/doaphragm on the wall of the cymba concha.



Upper and lower lung: these points lie in the cavum concha area, in line with shen men and kidney. The tip of the antitragus can be used as a landmark. Upper lung is located on the upper circumference of the „well” and lower lung on the lower circumference.



The NADA five points were chosen based upon clinical indication as well as a lower electrical resistance and pain sensitivity. All the five points serve to balance the body's energy and assist the body's healing processes.

I. SYMPATHETIC

Corresponds with the autonomic nervous system. This point alleviates stress and increases the secretion of endorphins. The

basic „fight or flight”, autonomic nervous system response to perceived danger evokes great anxiety and translates into a powerful stress response in the mind, nervous system and organs of the body. Anxiety gives way to calmness.

II. SHEN MEN

Translated as „spirit gate”, this point alleviates anxiety, controls nervousness, and has a general relaxing effect. It helps to bring the „spirit heart” (heart energetic) into balance for a conscious self. Impatience and moodiness gives way to joy and calm.

III. KIDNEY

Known as essential source energy, this point alleviates toxicity in the kidneys from chemical use. As a source or root energy, it is related to the life force and longevity. Fear is the associated temperament. Fear, anguish, and paranoia give rise to awareness and gentleness.

IV. LIVER

Rules the flow of chi. This point alleviates toxicity in the blood and liver. This energy is known to keep everything running smoothly. Stabilises impulsive behaviour and mood swings. The associated temperament is anger. Rage, depression and anger give way to balance and kindness.

V. LUNG

Rules life force chi. This point alleviates toxicity in the immune system, respiration and skin function. This is a nourishing organ in the very balance of the life force itself. Sadness is the associated temperament. Grief and sadness give way to courage and hope.

All the 5 points serve to balance the body's energy and assist the body's healing processes. The 5 point protocol is yin toxification, restoring the calm inner qualities akin to serenity. [10, 11]

Auricular acupuncture is specifically used in stress management, relaxation and chemical dependency treatments. All treatments are in accordance with protocol of the specialized National Acupuncture Detoxification Association.

6. Benefits of Auricular Acupuncture

- Effective across addictive substances
- Effective throughout the recovery process
- Can be integrated with a wide range of addiction treatment modes, including those utilizing medications
- Accessible to all
- It is non verbal and non-performance
- It elicits immediate and long term effects
- It has few contraindications and adverse reactions and is non addictive
- It is simple and flexible and inexpensive
- It balances symptoms, not symptoms, syndrome dependent.

7. Conclusions

Having in mind the positive effects of physical exercises and auricular acupuncture in the treatment of psychoactive substance addiction, we believe that implementing this two alternative therapy for detoxification in public or private health institutions from

Romania, constitute a real chance for people with addictions.

- Therefore the 47 anti-drug centres which carry on their activities at a national level, and specially the Anti-drug Centre of Prevention, Evaluation and Counselling from Braşov (which just in May 2010 confronted with more than 60 addiction cases) could respond better at their beneficiary needs adding auricular acupuncture and sustained physical exercise to their existing strategy.

References

1. Davidson, J.R.T., & Nemeroff, C.B. (1989) Pharmacotherapy in PTSD: Historical and clinical considerations and future directions. *Psychopharmacology Bulletin*. **25**.
2. Modie, Jonathan. (2003) *Good' Chemical, Neurons in Brain Elevated Among Exercise Addicts*. OHSU, online.
3. Chaudhry, Laura. (2004) *Brain Workout*. South China Morning Post, online.
4. J. Matthew, Neal. (2000) *The Pituitary Gland. Basic Endocrinology, An Integrative Approach*. Blacwell Science; 2000.
5. McKimmie, Marnie. (2005). Walk away from depression. *The West Australian* (Perth), online.
6. Acupuncture In: http://en.wikipedia.org/wiki/Acupuncture#cite_note-Dorlands-0
7. Glasser, William (1976) *Positive Addiction*. New York: Harper & Row.
8. Sould Exercise Regenerate Alcohol-Damaged Neurons? In: <http://pn.psychiatryonline.org/content/41/23/20.full>

9. The NADA Protocol In: http://acupuncturetoday.com/abc/nada_protocol.php
10. Michael O. Smith, MD, D, Ac, Acupuncture for Treatment of Cocaine Addiction
11. Sinyor, David, et. al. (1982) The Role of a Physical Fitness Program in the Treatment of Alcoholism. *Journal of Studies on Alcohol* **43**, no. 3.