

Acupuncture: from current “evident effects” to future “evidence of effectiveness”

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Introduction

Current standards of practice of medicine require from clinicians the commitment to an evidence based medicine (EBM) approach. Regarding the selection of a given therapeutic intervention an EBM approach means the judicious use of the best available evidence of effectiveness of that intervention in similar cases (from the scientific literature), integrated with the clinician’s experience, the patient’s preferences, and taking on account the availability of resources. In this manner, a true EBM approach allows clinicians the integration of very different levels of evidence into individual treatment plans that are both medically reasonable and ethically acceptable. Thus, unlike what some practitioners may still think regarding EBM, in clinical practice it is not necessary to provide the highest degree of scientific proof in order to integrate judiciously a safe and potentially beneficial therapeutic intervention into an individual treatment plan.

Since the main goal of any treatment is still to alleviate a person’s suffering (and not to add to), for sound clinicians safety concerns regarding a given therapeutic intervention are paramount, even surpassing the need for specific scientific evidence of effectiveness. In this respect, it is the opinion of the authors that a safe and effective intervention such as acupuncture, with a possible high degree of non-specific component (inappropriately know as the placebo effect) and a potential to help many patients, it is most of the time of greater clinical value than an intervention with a higher degree of specificity but with a high risk of causing iatrogenic pathology.

Evidence of adverse effects of acupuncture

After hundreds of millions of treatments executed over centuries, acupuncture has shown a remarkable safety record with only a handful of deaths associated to it, and a total number of documented adverse effects only in the hundreds. These adverse effects ranged from vasovagal effects such as nausea and syncope to the more serious perforation of a viscus (mainly the pleura causing pneumothorax) or the transmission of an infectious disease. Based on the existing literature, it seems that practitioners who use proper insertion technique and sterile disposable needles have a very low risk of having any serious complication.

Evident effects of acupuncture?

From an empirical standpoint, as well as according to existing literature, acupuncture seems to be a reasonably effective therapeutic intervention for the treatment of pain and functional problems of regulation. In the last few years, different degrees of evidence have been provided by the medical literature to add up to the information about basic mechanisms of action of acupuncture from basic animal research (information available to clinicians since the early seventies). However, it is important to notice that evidence of a specific effect or mechanism in an animal model (or in vitro), it does not constitute proof of clinical effectiveness, even though it may provide the necessary grounds for the development of well designed clinical studies that will in turn prove or disprove the clinical value of the intervention. This is nowadays the case for acupuncture, still in a historical cross road but clearly and rapidly defining itself as a legitimate intervention in the hands of well trained health care professionals such as physicians, physiotherapists, chiropractors, and nurses.

Clearly, the popularity of a therapeutic intervention is also no proof of clinical



Long jump Olympic champion Tatyana Lebedeva receiving acupuncture treatment in Athens.

effectiveness. For instance, at some point in no such a distant history, lobotomy was considered an effective and revolutionary clinical procedure, and one of its originators was even given the Nobel prize of medicine! Cases like this give us a sobering historical perspective and help put EBM on the level of respect that it deserves. However, it is important to highlight the unprecedented long term success of acupuncture among patients of all walks of life and cultural backgrounds, from peasants in the distant wetlands of ancient China to current Olympic champions (**see picture**), not matched in the history of medicine by any other specific intervention. These “evident effects” of acupuncture, coupled with its amazing safety record, constitute on themselves enough grounds to warrant further careful study of its clinical effects for the years to come.

Experimental and clinical effects of acupuncture

There are excellent contemporary texts that explain the many experimental and clinical effects of acupuncture registered in the scientific literature. In the limited space of this section of this article the authors would like to provide just a summary of the most remarkable of these effects.

Regarding the production of analgesia, acupuncture and electroacupuncture have shown to induce the release of numerous neurotransmitters and neuropeptides at different levels of the peripheral and central nervous system with modulatory effects on the transmission and processing of nociceptive signals. For instance, regarding muscle pain studies by professor C.H. Takeshige have demonstrated that analgesia in response to acupuncture stimulation is produced by two different mechanisms. One is the activation of the endogenous multiple pain inhibitory systems that act at segmental level (serotonin and noradrenaline mediated), and the other is the specific improvement of perfusion in the painful region mediated by autonomic reflexes and the release of nitric oxide.

Based on a review of 228 basic research studies, professor Bruce Pomeranz offered comprehensive theories which proposed that acupuncture activates nerve fibers A-delta and type II-III muscle afferents, sending impulses to the spinal cord that eventually activate centres in the mid-brain, the hypothalamus, and the pituitary gland, with release of different neuropeptides and neurohormones such as beta-endorphine, ACTH, and many more, with the overall effect of modulation of pain and regulation of neuroendocrine functions.

Some substances like enkephalin released in response to acupuncture stimulation may help explain some of the observed effects in the immune system. The term neuroimmunomodulation best describes the permanent intercommunication between central nervous system, autonomic nervous system, endocrine system, and immune system. Possible mechanisms of neuroimmunomodulation associated with acupuncture include the potent anti-inflammatory effect of met-enkephalin, which may even prevent anaphylactic shock. Or the enhancement of activity of natural killer cells and T cells by the different kinds of enkephalins.

Apart from its remarkable effects on pain and dysfunction of the locomotor system, there are also numerous documented effects of acupuncture on digestive function (motility and secretions), cardiovascular system (heart rate, blood pressure, etc.), gynecological and genitourinary systems, autonomic nervous system (xerostomia, nausea), limbic system (addictive behavior), mood control, especial senses, and few others.

This impressive array of effects is due to the multilevel response induced by the stimulation with the needles over responsive neuroreactive sites, nowadays defined in anatomical terms. Unquestionably, integrity of the peripheral and central nervous system is necessary for acupuncture effects to take place.

Clinical practice and evidence of effectiveness

In Western countries, responsible clinicians practicing acupuncture are increasingly using a simple neurophysiological approach to the design of treatments, that takes into account the above mentioned local, segmental, and supraspinal effects induced by the stimulation of the peripheral nervous system with the acupuncture needles. Integration of acupuncture into a treatment plan takes place more commonly through the selection of validated outcome measures to evaluate changes in the therapeutic goals. And more and more we have statistical evidence of acupuncture efficacy and effectiveness in the treatment of conditions and symptoms such as nausea induced by chemotherapy.

Future clinical research will include comparisons between acupuncture and other modalities, and comparisons of integrated treatments in which acupuncture plays some role versus other plans in which acupuncture has not been used.

Standardization in acupuncture education for health care professionals has not yet been achieved despite the existence of some vague World Health Organization 1996 recommendations. International acupuncture associations, particularly medical ones, are in the process of trying to achieve a consensus on this important task that will help integrate acupuncture education into the training of regulated health care professionals in Western countries.

For seven years, McMaster University's innovative Contemporary Medical Acupuncture Program has been an international contributor in this important task. Other programs in several countries are now using McMaster curriculum and format as the basis for their own training programs.

The McMaster Contemporary Medical Acupuncture program is open to physicians, chiropractors, osteopaths, and physical therapists. Information is available at www.acupuncturecourses.com or at 905-521-2100 ext. 75175.

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