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• Review

Can a science–based definition of acupuncture improve clinical outcomes?

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ABSTRACT

Research on acupuncture has been muddled by attempts to bridge the ancient with the modern. Barriers to effectiveness research are reflected in recurring conflicts that include disagreement on use of the most basic terms, lack of standard intervention controls, and the absence of functional measures for assessing treatment effect. Acupuncture research has stalled at the "placebo barrier" wherein acupuncture is "no better than placebo." The most widely recognized comparative effectiveness research in acupuncture does not compare acupuncture treatment protocols within groups, thereby, mutating large scale effectiveness studies into large scale efficacy trials. Too often research in acupuncture attempts to tie outcomes to traditional belief systems thereby limiting usefulness of the research. The acupuncture research paradigm needs to focus more closely on a scientific definition of treatments and outcomes that compare protocols in terms of prevalent clinical issues such as relative effectiveness for treating pain.

Keywords: acupuncture; research; medicine, traditional Chinese

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1 Introduction

Acupuncture as a modern profession should be a straightforward modality that involves the placement of needles at strategic points on the body to promote a healing response. Acupuncture remains intertwined with centuries old non-scientific healing arts known as traditional Chinese medicine (TCM). For example, Hui et al.[1] emphasized "the inseparable nature of body-mind-spirit, the centrality of dynamic homeostatic balance, the importance of energetic flow, and self-healing." This is a confounder in acupuncture research. Research in acupuncture is compromised when the modality is tied to explanations that belong with TCM. Our argument is to unwind this entanglement and conduct acupuncture research according to biomedical principles.

There continue to be forces attempting to drive change, but they have not yet elevated acupuncture to the level of mainstream practice. Avoiding prescientific arguments is one approach towards explaining acupuncture mechanism of action, efficacy and effectiveness. The most widely recognized comparative effectiveness research in acupuncture does not compare acupuncture treatment protocols within groups, thereby, mutating large scale effectiveness studies into large scale efficacy trials. *Acupuncture Medical Treatment Guidelines* describe updated standard scientific methodology for assessing practice outcomes and effectiveness.[2]

Acupuncture, like knives, has evolved over millennia. They have ancient origins, modern utility, varied history, and even today, spiritual value. The manufacture of knives has evolved further than has the application of

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acupuncture. Acupuncture needs to migrate from a mind-body-spirit medicine described by Hui et al.[1] to a healing art based on science. Knife construction has moved past a "hand me down" craft to a precise, replicable, and standardized industry where quality is measured scientifically. Although knife making and acupuncture still value the traditional master-apprentice teaching practices, it is time for acupuncture, like knife manufacture, to advance towards scientific methodology for assessing practice outcomes and effectiveness.

Kendall[3] scientifically described the mechanisms of action of acupuncture as based upon early Chinese descriptions of "blood circulation, organization of the cardiovascular system, somatovisceral relationships (communication between the external body and the internal organs), immune system function and the organization of the musculoskeletal system." The American College of Occupational and Environmental Medicine Guidelines recognized the effectiveness of needling without providing evidence of "meridians" or defining vital energy flow (qi).[4]

Acupuncture needles are inserted manually and either "twiddled" by the practitioner or, alternatively, attached to an electric current. These are the only two types of needling procedures that are recognized and reimbursed by insurers.[5] As is the case with other health professions, acupuncturists are not necessarily protected by laws that govern their scope of practice.[4–6] The most forthright recognition that acupuncture is a mainstream enterprise is the willingness of many insurers to pay acupuncturists for needling therapy.

In the biomedical world (which we refer to as the mainstream in this paper), research is an important driver for assessing cultural and social authority of a health profession.[7–9] It is therefore imperative that acupuncture research adheres to research principles as well as mainstream expectations for research models. Fealty to traditional themes may add complexity, raising the bar and occluding the picture. The research process should be straightforward and unencumbered by prescientific notions. We review four domains of acupuncture research—placebo, comparative effectiveness, Deqi and linguistics—to illustrate how fealty to traditional themes needlessly confounds acupuncture research.

Research bolsters the credibility of any health profession. Since being legally recognized as a medical profession in the 1970s acupuncture has relied on a legacy of "ancient tradition" to establish its credentials as a valid intervention. Training programs prepare practitioners to deliver outcomes based upon "thousands of years" of practice. This approach holds little value in the biomedical world. Until the Age of Enlightenment, when science emerged as a competing paradigm for understanding the world, traditional medicines were orthodoxy in healthcare. Traditional medicines were based upon observation of the patient. Systems such as Ayurveda, TCM, and mesmerism were typically tied to the cosmos and other poetic schemes that reflected paradigms of understanding in ancient times. By the early 20th century, biomedicine had established objective scientific theory which vigorously rejected cultural differences, effectively replacing folk medicines as the authoritative healing model.[7]

When considered as a single modality instead of a "whole system," acupuncture is easily adaptable to the biomedical model, fitting nicely into comparative effectiveness research. Variables that might distinguish models for comparison include stimulation—electric or manual, point selection, biomedical responses, and functional measurement of outcomes. Acupuncture treatments are based upon placing needles in combinations of specific points on the body. The ancient correspondence of these points to perennial seasons and cosmological phenomena is incompatible with the scientific method. Biomedical science locates acupuncture points along biological structures. Specific acupuncture points mapped in ancient records have been replicated according to biomedical neurovascular anatomy.[10] Combinations of points are specified as treatment strategies for specific injuries. The mechanism of action has been described in scientific terms as the movement of blood, stimulation of nerve points, and release of other bodily fluids to injured areas.[10] Physical effects and outcomes have been demonstrated in studies of needling therapy; however, outcomes are rarely correlated to common variations in technique: e.g., the insertion of the needles according to particular locations of particular points for a particular diagnosis, depth of needle insertion, and stimulation by "twiddling" versus electric current. Interestingly, there are numerous studies comparing acupuncture to the use of drugs and surgery to treat pain; however, the acupuncture treatment protocol frequently fails to meet standards of actual practice. Acupuncture is not researched as it is practiced by acupuncturists.

In this paper we describe investigative areas in acupuncture that illustrate efforts to make the transition to a biomedical model. In certain cases, such as linguistics, that transition may be inherently contrary to the study of language rules. If this is the case, then it is fair to conclude the examination of linguistics in the study of acupuncture should be paradigmatically neutral. In other cases, such as the investigation of the Deqi phenomenon, the transition from the traditional to the biomedical model illustrates how the transition can be successfully undertaken. In fact, the number of studies may be growing that focus on a biomedical approach, to test the effectiveness of incorporating specific acupuncture points