

Is Integrative Medicine the Next New Frontier in Medicine?

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Abstract Complementary and alternative medicine (CAM) methods are increasingly being used by patients in the Western world to treat autoimmune or allergic diseases. Patients use these methodologies of their own accord, frequently against the advice of their physicians. Integrative medicine hopes to merge the benefits of both conventional Western medicine and CAM. More and more research is being conducted to decipher the secrets behind the thousands of years of experience that CAM offers. Are these treatments effective, and are they safe? Or do they act simply by the “placebo effect.” This unique issue attempts to bring integrative medicine to greater awareness among Western physicians and practitioners.

Keywords Complementary and alternative medicine · CAM · Integrative medicine · Autoimmune diseases · Allergic diseases · Immunology

Complementary and alternative medicine (CAM) has been used to treat a wide range of maladies. In the context of medicinal history, complementary medicine did not always carry the “negative” connotation among medical professionals. In ancient times through history, these methods were believed to be the most advanced, cutting-edge treatments for the disease of the times. The development of the scientific method eventually pushed CAM back into the shadows as a methodology that was inferior to modern Western medicine because it was not, to use a medical sound bite,

“evidence-based.” There is indeed, some truth to this. Thousands of years of success using herbal remedies and ancient manipulative treatments was based on an individual's observation and interpretation alone, not subject to the rigors of scientific experiments.

The complexity of the human body adds an extra dimension to any form of treatment, ancient or modern. Even in modern medicine, clinical trials designed to the highest standard may produce results that are highly subjective. Sometimes, certain people will respond to a treatment and others will not, without any clear understanding as to why this is. No one treatment ever has been shown to benefit all individuals equally. Sometimes, as many randomized placebo-controlled clinical trials have demonstrated, the placebo arm produces equally effective results as the treatment arm. How can we explain this? Is it logical to assume that since there is no scientific evidence for the efficacy of CAM, it is really the “placebo effect” that relieves the patient's ailment? Does the compassion a physician shows for his patient have a curative effect in itself? How do we distinguish a true biological effect from a psychological one? These are puzzles that we cannot explain, to this day. The biology and pharmacology of the human response to medications and other therapies, while important, is not the whole story. This is where the “art of medicine” exerts its influence over “science.” One may argue that if we really did understand everything there is to understand about biology, would medicine still be an “artform.” Perhaps not, but then, if that ever occurred, perhaps physicians and caregivers would no longer be needed.

Certainly, the development of modern drugs, which follows the discovery of biochemical and immunological pathways, has been critical in improving life span and combating disease. Developments in medicine over the past 150 years have led to a better understanding of the genetic, epigenetic,

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and environmental factors that lead to diseases [1] and subsequently to the discovery of vaccines, antibiotics, anti-inflammatory agents, antioxidants, and other important treatment modalities that have resulted in improvements in our life span and quality of life. More recently, advancements in the development of biological modulators, fusion proteins, and other large molecular weight compounds have led to enormous advances in the treatment of allergic and autoimmune diseases [2]. However, like any other medications, there are related adverse effects, some predictable and some not. Nanotechnology is one of the more recent fields that may offer additional benefits in transporting drugs or herbal medicine components to the desired location in the body [3].

On the other hand, many conditions are not adequately treated by Western medicine. Sometimes, eczema and urticaria are very difficult to treat using conventional Western medications. Back pain and other forms of arthritis are particularly challenging as well. The etiology and pathophysiology of autoimmune and allergic diseases is not at all clearly understood [4]. The role of commonly available plant and animal materials as medications in the treatment of these disorders is even more enigmatic [4, 5]. It is ironic that it may be the failure of modern scientifically derived treatment modalities that has led many individuals to seek out old complementary and alternative medicine treatments. Recent data from National Center for Complementary and Alternative Medicine (NCCAM) indicates that 38.3 % of adults and 12 % of children in the USA have used some form of CAM in 2007 [6]. In addition, it was also estimated that people would pay far more for CAM than they would for mainstream physician visits and Western medications. With all the advanced medical methods we have today, why are people still resorting to using old, time-tried treatments with no great evidence for efficacy? It is quite common for parents to incorporate CAM treatments simultaneously with conventional asthma therapy, but the use of CAM does not appear to have any impact on overall medication adherence [7].

Integrative medicine is a combination of Western medicine and CAM. Whatever the motivations for the creation of such a discipline, the prospects for the development of new therapeutics are promising. However, this will require a reconsideration of how to support this discipline. It is not a matter of creating a name that sounds good, hoping that either component will be more favorably viewed from both professionals and nonprofessionals. If integrative medicine is going to be viable, then it needs to offer something that current CAM and current modern medicine does not. Better quality studies on CAM need to be done to validate the efficacy and safety of traditionally used medications and treatments, no matter what the previous experience has been. Safety, in particular, must be addressed, as some

currently used CAM medications are such a complex mixture of different plant and animal products that many bioactive components have yet to be identified.

In this issue, the application of the modern scientific method to CAM is reviewed for many different immunological diseases, and separate articles specifically address the use of integrative medicine in rheumatoid arthritis, ulcerative colitis, and atopic dermatitis. The role of traditional Chinese medicine (TCM) and acupuncture is also reviewed. Frequent claims are made regarding the effectiveness of probiotics, prebiotics, and synbiotics in the treatment of allergies and conditions such as atopic dermatitis, but the evidence is far from convincing and a great deal of more high quality research needs to be done to establish efficacy and safety [8]. The broad range of topics discussed within these articles also include the role of Ayurvedic medicine and manipulation techniques such as yoga, meditation, massage therapy, acupressure, and acupuncture in the treatment of allergies and immunological disorders.

The safety of herbal formulations in the treatment of atopic dermatitis is addressed, specifically to determine active ingredients that may parallel some of the modern medications used in the treatment of this disease, such as topical corticosteroids. In fact, it is already known that a particular species, *Desmodium*, from which a variety of herbs are derived, does indeed contain appreciable amounts of corticosteroids [9]. This may explain the efficacy of this group of herbs in the treatment of inflammatory skin conditions such as eczema but raises the possibility that other herbal medications may contain appreciable amounts of bioactive substances capable of causing side effects that are unknown to the patient. Besides plant-derived materials, animal or insect products are also used as CAM therapies, as the article on propolis illustrates.

Besides herbal formulations, acupuncture has been used extensively to treat many chronic inflammatory conditions. The World Health Organization has sanctioned the use of acupuncture in many different conditions [10]. However, the evidence for its effectiveness has not been adequately demonstrated for many of these cases. Further, well-controlled trials using SHAM acupuncture must be conducted for each of these conditions in order to demonstrate the effectiveness of this mode of therapy. The same can be said for massage therapy and acupressure. Other forms of mind-body therapeutic modalities, including yoga, meditation, and aromatherapy, have even less scientific evidence for their effectiveness and safety. However, the risk of side effects from these treatment modalities is probably low to none, and the potential benefits, even if they are solely related to a placebo effect, may outweigh these risks in certain patients.

Integrative medicine is currently in a growth phase and at different stages in different countries. China has been using

Chinese integrative medicine for several decades now and has made some progress in defining a scientific basis for the treatments. It is interesting to observe the practice of integrative medicine in China and to appreciate the wide range of state-of-the-art modern diagnostic equipment including CT scans, MRI, PET scans, and endoscopy suites that are used in traditional Chinese medicine hospitals. In many cases, these hospitals are significantly better equipped in modern equipment than their Western counterparts. At the same time, traditional empiric alternative and complementary medicine techniques are used on patients once the diagnosis is made. The way of the future may in fact involve a synergistic approach to research, whereby the effects of Chinese herbal medications on cytokine signaling pathways and cells can be clearly delineated [11].

Reviews of the scientific literature originating from countries where the scientific method is a more recent phenomenon have in the past demonstrated a lack of sophistication in study design, leading to a lower standard of published material. Whether or not this is due to a lack of ability among those who conduct research on TCM to fully appreciate the nature of the scientific method, or to switch gears from a traditionally empiric experience to one that questions every aspect of study design to ensure that all confounding variables taken into account, is a matter of debate.

This is a unique issue in *Clinical Reviews of Allergy and Immunology* in that it focuses on therapies with a long history of empiric data but little scientific validation of their efficacy and safety in several allergic or autoimmune diseases. Previous articles in this and other journals have described major advances and reviewed current literature on new medications for a variety of diseases such as asthma [12, 13], rheumatoid arthritis [14, 15], Crohn's disease [16], atopic dermatitis [17], and other related diseases, while this issue describes attempts to clarify the efficacy and safety of old herbal and other manipulative therapies. In the USA, the use of the term “integrative medicine” has been viewed by some skeptics to be a poorly veiled attempt by supporters or practitioners of CAM to impart some degree of legitimacy to the generally unproven modes of therapy that they provide [18, 19]. Schools that offer curricula in integrative medicine have been labeled as “antiscience” [18]. While this viewpoint may be somewhat harsh, there may be some truth in this. On the other hand, a more positive and less suspicious perspective to this would view integrative medicine as a field that provides a wide ranging set of opportunities for characterizing and understanding the mechanism of action of old medications and also for developing and studying new avenues of therapeutics. At the current time, research is desperately needed to fulfill this promise, or integrative medicine will never rise to the point of acceptance by the scientific community. It is perhaps a reflection of the current attitude towards integrative medicine

that many mainstream, well-reputed schools of medicine have incorporated integrative medicine or even CAM centers into their institutions. The NIH has established a center, the NCCAM for the purposes of supporting research related to CAM. Whether or not these herculean efforts bring success in treating the physical and spiritual ailments of the human race is yet to be seen.

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