Chapter 6
Data–Mining Techniques for an Analysis of Non–Conventional Methodologies:
Deciphering of Alternative Medicine

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ABSTRACT

Some common methodologies in our everyday life are not based on modern scientific knowledge but rather a set of experiences that have established themselves through years of practice. As a good example, there are many forms of alternative medicine, quite popular, however difficult to comprehend by conventional western medicine. The diagnostic and therapeutic methodologies are very different and sometimes unique, compared to that of western medicine. How can we verify and analyze such methodologies through modern scientific methods? We present a case study where data-mining was able to fill this gap and provide us with many tools for investigation. Osteopathy is a popular alternative medicine methodology to treat musculoskeletal complaints in Japan. Using data-mining methodologies, we could overcome some of the analytical problems in an investigation. We studied diagnostic records from a very popular osteopathy clinic in Osaka, Japan that included over 30,000 patient visits over 6 years of practice. The data consists of some careful measurements of tissue electro-conductivity differences at 5 anatomical positions. Data mining and knowledge discovery algorithms were applied to search for meaningful associations within the patient data elements recorded. This study helped us scientifically investigate the diagnostic methodology adopted by the osteopath.

INTRODUCTION

Growing acceptance of alternative medicine by the public has convinced third party organizations to increase the level of insurance coverage and has caused the U.S. Congress to rule for establishment of the National Center for Complementary and Alternative Medicine (NCCAM) at the National Institutes of Health (NIH) (Jonas, 1998; Nahin & Straus, 2001). However, these methodologies are still considered largely unsubstantiated by many practitioners of conventional western medicine. The problem many of these investigators are faced with is the difficulty in performing trials of an intervention not based on clinical practice as well as trials of multifaceted interventions that are too complicated for a conventional study design (Miller et al, 2004; Lewith, 2003). Can data-mining help explore non-conventional methodologies such as those used in alternative medicine in the light of science? NCCAM has been seeking the advice of the scientific research community in this regard.

Western medicine has benefited from inquiry into non-traditional healing practices whether it has been through the study of chemical agents or through the study of physical modalities like acupuncture. Complimentary/alternative medicine (CAM) is gaining more popularity in the US, Europe, Australia and elsewhere (Eisenberg et al, 1998; Cassileth et al, 2001). Probably the popularity of complementary /alternative medicine has increased because of some dissatisfaction with modern medicine or with the economics of clinical care surrounding the management of ill-defined chronic conditions (Imanishi et al, 1999). The following classification has been suggested for the main CAM modalities (Gordon et al, 1998): manual therapies (e.g. chiropractic, osteopathy, acupuncture, acupressure, and massage), oral therapies (e.g. herbal medicines, homeopathy, diets, and vitamins), mind–body therapies (e.g. meditation, relaxation, biofeedback, and hypnosis), movement-based therapies (e.g. Tai chi), and support therapies (e.g. counseling, support groups, prayer, and other religious practices). Manual therapies are by far the most widely used CAM modalities (Koes et al, 1992; Eisenberg et al, 1993; MacLennan et al, 1996; Astin, 1998; Druss & Rosenheck, 1999). Although there are many issues that arise in categorizing the use of diagnostic modalities as western versus non-western, we will not concern ourselves with such classification issues in this paper any further

BACKGROUND

In Japan, Chinese herbal medicine (kampo) which was originally introduced in the 5th and 6th century has been significantly modified by Japanese practitioners over a long time. Kampo was excluded from authorized medical practice about 100 years ago but is still, along with acupuncture, electro-acupuncture and moxibustion widely practiced and popular. In Japan, non-western medical treatments are sought for various ailments and illnesses in spite of the fact that medical practice in Japan is one of the most advanced in the world.

Modern osteopathy was probably started in the late 1800s by an American physician called Andrew Still. Osteopathy is now a quite established profession in the U.S.A. with many osteopaths diagnosing and treating medical problems using manual touch. They get training on how to feel (through palpation) the body´s anatomy, the texture and motion of tissues, the flow of fluids and its structural makeup. In osteopathy, the body´s innate power to heal itself is emphasized, and it is believed that previous physical trauma leaves its touch on the body's structure. The osteopaths generally try to develop a strong sense of touch to detect physical problems, and to apply the exactly right amount of pressure to treat dysfunction in the motion of the tissues, restore movement of fluids and to release compressed joints and bones.

In Japan, a particular type of osteopathy that has its roots in the martial arts practice of Judo

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