

# Applications of applied kinesiology in dental practice

Suryakant C. Deogade <sup>1</sup>, Dinesh Naitam <sup>2</sup>, Jaiprakash R. Rathod <sup>3</sup>,  
Sushant M. Patil <sup>4</sup>

<sup>1</sup> Department of Prosthodontics and Crown & Bridge, Hitkarini Dental College & Hospital, Jabalpur, Madhya Pradesh, India.

<sup>2</sup> Department of Dentistry, Government Medical College, Akola, Maharashtra, India.

<sup>3</sup> Department of Conservative Dentistry & Endodontics, Government Dental College and Hospital, Mumbai, Maharashtra, India

<sup>4</sup> Department of Prosthodontics and Crown & Bridge, Government Dental College and Hospital, Nagpur, Maharashtra, India

**Abstract.** Amongst different approaches of complementary and alternative medicines used for treating any type of ailment, applied kinesiology (AK) claims to diagnose illness or select therapy by manual testing muscles for strength and weakness. Applications of AK in dental practice have given a complete assessment, reevaluation and understanding of a patient's general health and wellbeing. AK provides dentists with a wide variety of options for enhancing their diagnostic and therapeutic strategies. The different aspects of structural integration, selection of dental materials, and the equipments used for muscle testing have been described in this article. An overview of literature reveals a positive response by many dental clinicians towards this tool. This article reviews regarding AK and its applications in dental practice.

**Keywords.** Applied kinesiology, manual muscle testing, TENS.

## Introduction

The word kinesiology is derived from the words "kinesis" meaning movement and from "logos" meaning to study. Kinesiology in common medical usage is "the study of muscles and muscular movement" (Taber's Medical Dictionary, 1997). However, when coupled with the word "applied," a whole new concept is invoked: the use of muscle testing to evaluate body function (Walther, 1981). Applied kinesiology (AK) concerns the art and science of manual muscle testing, thereby diagnosing an area of dysfunction. These areas can then be tested in relationship to therapeutic reflex points and acupuncture points to identify causal factors.

In clinical dentistry, health problems related to musculoskeletal system have become increasingly common worldwide during the past decades that include both, dentists and dental auxiliaries. Therefore, understanding the mechanisms or risk factors of musculoskeletal dysfunctions

(MSDs) is a topic of growing importance in health professionals. Modification of the motor nervous system in diagnosing and treating such MSDs is one of the research strategies (Lee, 2004; Vleeming et al., 2007; Sahrman, 2002; Suter et al., 2000; Cowan, 2001). In AK, the response of a particular muscle to resistance applied by a trained professional examiner was first proposed by George Goodheart to be a summation of all the excitatory and inhibitory inputs of the anterior horn motoneurons, such that a failure of the muscle in the test could be linked to a dysfunction of the nervous system. In other words, AK has been proposed to be a study of functional neurology (Schmitt & Yanuck, 1999; Goodheart, 1964, 1988). A variety of conservative and non-invasive therapies have been proposed for such dysfunctions that include joint manipulations, myofascial treatments, cranial techniques, meridian and acupuncture skills, clinical nutrition and dietary management, and various reflex techniques (Rosner & Cuthbert, 2012).

The initial and very basic conceptual model of health in AK is in the form of an equilateral triangle that is considered as the triad of health. The sides of this triad reflect structure, chemical, and mental elements of a human body which could influence muscle strength that ultimately disturbs human health. These three elements of the triad of health controlling human health are interrelated to each other and are very useful in AK evaluation. For example, fear (mental) leads to the release of adrenaline (chemical) in the body that increases the tension in skeletal muscles (structural) in preparation for fight or flight. The different alternative healing professions tend to specialize in only one side of this triad of health. Structural treatments include chiropractic, massage, osteopathy, surgery, and dentistry. Chemical therapies include nutrition and medication, whereas, mental therapeutics include counseling and psychology. In chronic health problem all three sides of the triad of health usually become involved. Hence, it becomes important to diagnose and treat the primary problem otherwise the secondary problems may emerge. Goodheart

recognized the importance of the triad of health and investigated the capacity of the muscle testing technique to comprehensively test all three sides of the triad. Extensive investigation convinced him that muscle testing worked well in the assessment of all of the factors affecting health.

The first form of AK was discovered, developed, and taught for more than 40 years by the brilliant George Goodheart. Because of his discovery and large body of research, many consider him to be the pioneer grandfather of the modern holistic and alternative health-care movement that has grown into a multibillion-dollar industry. Goodheart recognized 'five factors' into which therapeutic techniques could be classified which in turn could affect muscle strength (Goodheart, 1988). These factors are the nervous system, the cerebrospinal fluid system, the lymphatic system, the vascular system, and the acupuncture meridian system. Goodheart's work drew a large following of doctors and recognition. In 1976, Goodheart founded the International College of Applied Kinesiology (ICAK) to promote the research and teaching of AK (Green & Gin, 1997). The chiropractic historian, Joseph Keating (1992) applauded the organization. The organization has members from multidisciplinary medicine including medical doctors, osteopaths, dentists, psychologists, and other healthcare providers.

Muscle reflex test phenomenon, which is commonly referred to as manual muscle testing (MMT), is one of the most common tests recommended and followed to practice AK. The appeal of this chiropractic examination tool is that, when used properly, it can indicate a broad array of human dysfunctions (biomechanical, biochemical, and biopsychosocial). This has made AK popular so that today almost half of the chiropractic profession uses some style of the AK skills first introduced by Goodheart and the ICAK.

### Historical overview of applied kinesiology

Applied kinesiology (AK) has been recognized initially by Goodheart (1965), a chiropractic physician, in Detroit, Michigan. Goodheart's keen observations regarding muscle balance, muscle strength and muscle weakness conflicted with the earlier theory that muscle spasm was the primary cause of pain. According to him, weakness of any muscle causes the contralateral, antagonistic or opposing muscles to contract, thereby causing pain. When a muscle contracts without the normal antagonistic response, it is the weak or inhibited muscle that needs to be facilitated, thereby restoring muscle balance and relieving secondary muscle spasm (Goodheart, 1965).

In 1964, Goodheart claimed to have corrected a patient's chronic winged scapula by pressing on nodules found near the origin and insertion of the involved serratus anterior muscle. This finding led to the origin and insertion treat-

ment, the first method developed in AK. Successive diagnostic and therapeutic procedures were developed for neurolymphatic reflexes, neurovascular reflexes and cerebrospinal fluid flow from ideas originally described by Frank Chapman, Terrence, and William, respectively. Stimulation of Chapman's lymphatic reflexes was accompanied by a strengthening response in a specifically identified weak muscle, as determined by manual muscle testing (MMT) (McCord, 2015; Taber's Medical Dictionary, 1997). Later, influenced by the writings of Felix Mann, Goodheart incorporated acupuncture meridian therapy into the AK system. Adequate stimulation was observed as measured by MMTs, hence eliminating the need for acupuncture needles, simplifying the AK techniques for healing. Additionally, the vertebral challenge method and therapy localization technique, both based on phenomena proposed by Truscott, were added to the AK system.

McCord & Fletcher (2005) supported the triad of health theory and demonstrated that chemical element played an important role in depicting health of an individual. Fletcher observed that neural pathways from the mouth to the brain impacted muscle activity. Schmitt & Leisman (1999) also demonstrated a high degree of correlation between AK procedures used to identify food allergies and serum levels of immunoglobulins for those foods. Blood drawn showed that patients had antibodies to the foods which were found to be allergenic through AK assessment. Cuthbert & Goodheart (2007) reviewed more than 100 studies related to MMT and the AK chiropractic technique that employs the same. There was evidence for good reliability and validity in the use for patients with neuromusculoskeletal dysfunction. Good validity was demonstrated by observational cohort studies, and randomized controlled trials.

Chambers et al. (2009) observed that exercise performance was improved with mouth rinsing by carbohydrate rather than saccharine, supporting the specificity of oral receptors, in this instance distinguishing carbohydrates from sweetness. Observing the change in muscle function after a patient ingests a nutritional entity is a frequently used method of nutritional testing in AK. Melzack & Wall (1973) suggested a neurologic explanation of the phenomena of 'therapy localization'. According to this explanation through the nerve fibers associated with touch, the body's answer is registered by a change in muscle strength, as identified by the MMT response.

### Applied kinesiology in dental practice

Applied kinesiology offers dentistry strong reasons for the practice of this medical specialty as it is able to show substantial effects on the total health owing to minute changes within the oral cavity. In clinical dentistry, energy testing using muscle testing techniques along with kinesiological testing can be a valuable aid to diagnoses, and a way to

discover how dentistry affects other areas of the body or the whole body in general.

Stomatognathic system and the rest of the body exist as integral components of our neuromuscular system and can never function without the influence of agonists and antagonists. The use of AK helps to diagnose a disruptive influence present within the stomatognathic system. It can also be used in combination with other clinical skills to correct the source of dysfunction (Monti et al., 1999). Any malocclusion is always associated with altered cervical neuromuscular function and postural mechanics. This results in a tendency for neck problems, such as cervical subluxation or fixation. A cervical fixation arising as a result of stress or injury may alter the occlusion, and can even lead to undue stresses on masticatory system. Cranial-sacral system, which involves the meningeal membranes as a functional link between the physiologic micromotion of the bones of the cranium and pelvis is affected by this closed kinematic system of the body. The term, Lovett Brother (Learner, 2015) is used to describe the compensatory response to displacement or rotation of a component of the skeletal chain (Cuthbert & Goodheart, 2007).

Use of AK can be done in various fields of dentistry. The advances made previously in orthodontics and orofacial orthopedics can be related to dental somatic integration. The need to integrate the function of the mouth with the rest of the body has led to a third generation of orthodontic appliances that treat the distortions of the mouth. These appliances are called light-wire functional which are fitted to the dental arches and apply a continuous gentle force to the teeth and the bones of the face and skull (Malory, 2015).

In 1975, Black classified cavitations also called NICO lesions, which are formed by progressive disease process in the jawbone (Ratner, 1979). These cavitations destroy the bone cells and produce a large cavitation area. These are usually observed in the third molar extraction region and can produce trigeminal pain, headaches and facial pain (Rather, 1979). AK is effectively used for detection and treatment of such cavitations, wherein, a nonvasoconstricting anaesthetic agent is recommended that result in constriction of blood vessels resulting in reduced oxygen supply in that region. Cavitation sonography diagnostic system can be used in diagnosis of cavitations. The pulsed ultrasound gives an image of the bone which is used to determine the amount and health of bone present in that area.

A Low Level Infrared Laser Therapy or Anodyne and Hyperbaric Oxygen are some of the other supportive therapies that are used in post-surgical conditions. An Anodyne unit helps to increase the blood circulation to the area being applied. Ozone can be applied in periodontal treatment to eliminate bacteria in root canal teeth and to eliminate microorganisms before cementing a crown or a resto-

ration. Ozonated water helps in healing and remineralization of the bone in extractions, cavitational surgery, and implant placement procedure (Saini, 2011). Injection of Ozone gas into the TMJ helps to reduce the inflammation and stimulates new cartilage growth. In periodontally compromised conditions, a custom tray fitting snugly over the teeth and gums can be recommended, wherein, an Ozone gas passed into the tray for a certain period of time. This is done for few months which help maintain periodontal health and prevent decay (Venture Holistic Dentistry, 2015; Saini, 2011).

AK provides a quick, simple, and reproducible method of approaching the issue of material tolerance both from a preventive and a curative point of view. AK can help assess the material incompatibilities by evaluating the energetic state of the body along the acupuncture meridians and in the auric field of the body. The declined energy levels confirm that the materials (composites and amalgam) are not biocompatible. The bioenergetic response testing such as contact reflex analysis and electrodermal screening is employed to determine amalgam incompatibility (Rather, 1979). Impaired renal function and mercury allergy are often reported with amalgam fillings. ICAK have introduced a biocompatible and inert material (Diamond-Lite) that invokes no response from the body.

The TMJ pain and disorders can be treated with multiple techniques in the field of AK. The nerve related acute and chronic pain TMJ dysfunctions can be corrected by utilizing the transcutaneous electrical nerve stimulation (TENS) which sends electrical impulses across the surface of the skin and the nerve strands. Bio-TENS is a low frequency TENS unit that delivers a mild electrical impulse to the muscles that participate in functioning the jaw. Myomonitor is the other device that is used to help relax the patient's muscles and stimulates the trigeminal nerve and the facial nerve using a very mild electrical impulse. The Biopak system which is a computer-assisted analysis device, records the position of mandible. The Computerized Jaw Tracker employs a magnet and a sensor that measures and records the ideal position of mandible in three dimensions. Eight Channel Electromyograph measures the muscle activity by recording the amount of electrical potential generated in an individual muscle. Joint Vibration Analysis measures the absolute intensity and frequency of the vibratory waves originating from the joints as it is worked throughout its full range of motion. These waves are measured with sensitive microphones worn over the joints, for example TMJ, and assess the validity of an intervening dental therapy and its effects on its internal health. Numerous appliances, such as orthotic device and pure power mouthguard are based on the principles of neuromuscular coordination and balance. The former appliance keeps the jaw muscles in their resting position and allows them to remain at their ideal length which further dissipates the

TMJ pain and helps in its healing. The latter one helps in stabilizing the mandible and helps in achieving its maximum power, strength and performance (Singh et al., 2015).

## Conclusion

Among all the approaches of applied kinesiology offered in dental practice, a common examination protocol is one of the main motivations inspiring applied kinesiology. Applied kinesiology offers a comprehensive and highly diversified range of diagnostic and therapeutic tool to dentistry that is used as an aid in diagnosing biochemical, mental, or structural imbalances in the body. The positive response observed in previous studies is correlated with clinical history, physical examination findings, laboratory tests and other standard diagnostic methods. The basic requirements for a successful implementation of AK in dental practice is comprehensive training in the strict classical method of muscle testing, learning to understand the systems interacting within the body, knowing about holistic approaches and a knowledge of naturopathy. Intensive interdisciplinary communication would be a matter of concern in future.

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