VEGAtest: Diagnostic Champion or Quack Device?

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At present, the diagnosis of IgE-mediated diseases relies on a number of standardised and validated procedures, including skin testing, RAST assay and allergen-specific challenge. Nevertheless, during the last 10 years many unconventional diagnostic procedures have been proposed and increasingly used. One such technique, "VEGAtesting" (a form of electrodermal testing), analyzes electrical skin responses. However, scientific research to support the efficacy of these procedures is still lacking.

Background

The first form of electrodermal testing was developed by Dr. Reinholt Voll in the 1950s. His aim was to create a sophisticated and noninvasive (although not necessarily painless) approach to acupuncture that would supercede traditional Chinese diagnosis and the use of acupuncture needles. Serendipitously, Voll developed an electroacupuncture technique known as EAV.[2] He suggested that an acupuncture point might represent a particular organ, such as prostate or lung (an entirely unproven assumption). He further postulated that by measuring the conductance of acupuncture points, one could gain insight into the states of the respective meridians within a patient's body. In this way, not only could acupuncture points be located, but damage to the meridians could also be assessed and appropriate measures could be taken. Voll developed a complex diagnostic system based on the acupuncture meridian system. Furthermore, he placed extracts of medicines into series in the circuit and claimed that useful medicines could thus be detected. His technique necessitated the measurement at many acupuncture points.

During the 1970s, another German practitioner, Dr. Helmut Schimmel, who held dual dental and medical qualifications, discovered a way to improve EAV. Instead of using many acupuncture points for diagnostic and therapeutic purposes, he found that he could successfully test any acupuncture point, provided that he inserted selected diagnostic homoeopathic test vials into an electronic circuit involving the patient and the tester.[2] He called his method 'the VEGAtest', and the test vials 'filters'. The term 'Vega' is taken from the trade name of the manufacturers of Schimmel's original electronic equipment. Since then, numerous competing companies have produced rival equipment. Schimmel preferred to call his method "the autonomous reflex test (A.R.T)" or "the vegetative reflex test (V.R.T.)".

Recently, electroacupuncture has been employed in many diagnostic and therapeutic systems collectively termed 'biological medicine'. These devices are most commonly used by naturopaths and chiropractors. To the conventional physician, this type of testing may sound somewhat suspect. To start with a series of assumptions that pertain to traditional Chinese medicine and then use them to substantiate homeopathic diagnosis and treatment perhaps moves us into the realm of a medicine that would be difficult, if not impossible, to test within the context of modern clinical research and a randomised clinical trial.

Apparatus & Technique

The apparatus consists of a box which contains a galvanometer (Wheatstone bridge circuit). This compares the resistance between the skin in contact with a hand electrode and the skin tested with a measuring stylus. The other contents of the box are an electrical source to provide a direct voltage of 0.87 volt through the patient, and a metal honeycomb in which ampoules can be placed in series with the circuit. A dial with 100 scale divisions shows 100 when the connected resistance is 0, and shows 0 when the connected resistance is infinity.[1]

Initially, a piezoelectric spark generator (producing 400 volts/second), is applied to the patient. This "stresses" the patient and is claimed to unmask weaknesses in the body.[4,5] The patient grasps the hand electrode, and a control measurement is made by applying the stylus (probe) to the patient's finger or toe. The machine is adjusted until a reading of 80 to 100 scale units is produced. A chosen extract is now placed in the circuit and the measurement repeated. A drop of 15 scale units or more is considered a positive result. Interestingly, VEGAtesting readings can also vary with the amount of pressure with which the probe is applied to the patient's skin.

It should be emphasized that the various extracts are in homoeopathic doses. Dilutions of 10^{-4} or greater are usual. In addition, these extracts are in sealed vials that are inserted into the metal honeycomb where current flows around these vials. When a vial containing the resonance of something allergic or toxic to an individual is placed in circuit, VEGAtesting records an increase in body impedance. Alternatively, when effective treatments are also included in circuit the impedance normalizes.[4,5] In this way, by monitoring changes in the body's subtle energies, it is possible to scan for a wide range of diagnoses and treatments using safe and non-invasive technology. Recent

versions of VEGAtesting machines make sounds and provide the readout on a computer screen.

Use of VEGAtest

Many claims are made of the diagnostic capabilities of VEGA testing, and are divided into organ testing, pretesting, biological age, diagnosis of premalignant conditions, allergy testing, and testing for remedy tolerance and effectiveness. For example, in organ testing, a site of abnormality can be determined by the organ extract that elicits a positive response. Extracts from all organs, including such diverse ones as the coronary arteries and the common bile duct, are supplied. There are even extracts of such organs as the mammary gland and the epididymis.[3]

Another common use of VEGAtesting includes the technique called "pre-testing". This is a technique for obtaining information about general "stresses". Examples of extracts that are used and what they detect include chlorophyll or linseed oil (chronic stress); saturated sugar water (acute stress); candida (multiple food allergies); and allergy "injectopas" (autoimmune diseases). There are many other examples. Testing of "geopathic stress" is claimed to arise from subtle environmental influences such as mines, caves, running water, electrical appliances and gravity fields. Extracts of agate, calcium or silica are used to detect these disturbances. There is even a report of a false-negative geopathic stress test result due to the influence of the full moon.[4,5] Stresses and disorders which are undetectable can be measured by adding an "amplification" extract. The recommended extract for this purpose is "epiphysis" (pineal gland organ preparation).

The "biological age" of a person is determined by different dilutions of potentised mesenchyme (embryonic connective tissue). The biological index relates to the soft interstitial connective tissue (mesenchyme) that is also known as the "basal system". The mesenchyme's functional state reflects the patient's biological age (i.e. how "worn out" the body is). Biological age is subdivided into 21 biological age tiers, in which the first tier corresponds to a state of full health and the 21st to death. For example, in a case where a patient's non-specific biological index (BI) is 13/17, a BI of 13 indicates the possible presence of clinically detectable disturbances; an age tier 17 usually indicates the presence of overt clinical diseases.[1]

Premalignant conditions are diagnosed by means of "psorinum" extract. Standard test vials containing homoeopathic extracts of carcinoma, sarcoma and leukaemic white blood cells, among others, are used to identify these tumours in the body. An extract of the poison ivy plant (*Toxicodendron radicans*) is used to diagnose the presence of cysts in the patient.

Allergy testing was developed as a popular use for the VEGAtest in the early 1980s, largely in the United States but also in Canada. This was primarily in response to the unmet need to arrive at an appropriate diagnosis for food intolerance with a safe, non-invasive and simple mechanism.[11] The use of the VEGAtest to aid dietary exclusion has been reported to be effective in a number of observational studies.[12,13] The apparent effectiveness of these approaches, along with a lack of resources within the field of clinical allergy, and a reluctance among some clinical allergists to accept their patients' observations about the beneficial effects of food exclusion diets, has created an opportunity for untrained "allergists" to enter the market place offering opportunities to patients to have their "allergies diagnosed". Therefore, rigorous evaluation of electrodermal testing is important.

Currently, there appears to be no restrictions on the type of material tested by VEGAtest. Allergies to any substance can be detected by placing extracts of these substances in the circuit. VEGAtesting is usually promoted for the diagnosis of such disorders as *Candida* allergy, chronic sinusitis, streptococcal toxicity and chronic tonsillitis, *Salmonella* toxicity, myalgic encephalomyelitis, and allergic status to food and aeroallergens.[4,5] Furthermore, the detection of food intolerance is claimed to be quick and reliable and approximately 80% accurate.[4,5]

Critique

There is little evidence to support the theoretical basis or the practical claims of the VEGA test method. Dr. Schimmel, inventor of the VEGA machine, once wrote "the effective base of the VEGA test method is still unknown."[3] Nevertheless, various techniques and theories have been used to rationalize the use of these bioregulatory techniques.

Many supporters of VEGA testing and handbooks describing the technology use convoluted pseudoscientific jargon. A good example is the following sentence taken from the handbook which accompanies the VEGA machine: "Only after applying a suitable stress, which forces the organism to regulate in response to this stress, can the energetic compensatory processes be made manifest for a short time, and in most cases, show a clear correspondence with the morphological findings."[3] Moreover, VEGA testing descriptions often allude to accepted physical principles. Krop *et al.* state that "the key to scientific understanding of these techniques lies in the area of particle physics, particularly the Heisenberg uncertainty principle and the Einstein-Rodolsky-Rosen effect."[6] Notwithstanding, neither they nor others attempt to bridge the gap between traditional physics and bioregulatory diagnosis.

Another type of reasoning used to endorse VEGA testing includes begging the question. Kenyon, in his book, 21st Century Medicine, writes "the observation that structural change in the body ensues following pre-existing long-standing electrical change is repeatedly confirmed by bioregulatory techniques."[2] Here, Kenyon assumes that bioregulatory techniques are scientifically valid methods of measurement, and hence this does not constitute evidence for the premise.

Previous research on the legitimacy of VEGA testing by Katelaris *et al.* noted several incidences of using irrelevant cita-

tions to bolster the effectiveness of the technology. A review of VEGA testing by Gould cites three references as "some evidence supporting the relationship between evoked electrical conductivity and particular acupuncture points which are of diagnostic value to the patient's particular disease process."[4,5] In fact, the first of these references is a letter to the editor in the *Journal of General Practice*, which has no direct supportive data.[7] The second reference proposes to provide evidence that the elicited electrical conductivity on lung acupuncture points can diagnose lung cancer.[9] This paper interestingly describes as many false positive results as true positive results and counts twice in some instances, thus expanding the series. Finally, the third paper describes the change in skin resistance after vagotomy in rabbits and presents no statistical analysis of the findings.[10]

In addition to such problems supporting VEGA testing, claims have been made of clinical success. This is the "fall-back" position of proponents of the VEGA test method.[4,5] There are no controlled trials to support claims such as "what are more important than the scant scientific data, are the clinical results obtained."[4,5] Contrary to claims of clinical success are proven studies where VEGA testing has failed to demonstrate superior diagnostic capability.

The area where practioners make least claim probably relates to electrodermal testing in the diagnosis of an individual's response to aeroallergens. It is however, easiest to test these claims as the skin prick test provides the simplest reliable gold standard within the field of allergy. Consequently, three randomised controlled trials have now been published which critically and scientifically evaluate electrodermal testing in the diagnosis of aeroallergens. The first study by Krop *et al.*, was the smallest.[14] It used a VEGAtest and claimed highly significant correlation with skin prick testing evaluating house dust mite, histamine, distilled water and saline using the VEGAtest in an apparently blind study. According to studies by Lewith *et al.*[15] and Semizzi *et al.*,[16] the findings reached by Krop *et al.*, must be treated with great caution. Lewith *et al.*'s study clearly revealed no correlation between skin prick test and electrodermal testing. Semizzi *et al.*'s study was a large randomised controlled trial which failed to show any variation in allergic status with electrodermal testing to a variety of aeroallergens and histamine versus the control of physiological saline. IgE-dependent food allergies (ie. to milk, eggs, or nuts) have the same pathophysiological basis as mucosal responses to aeroallergens, so VEGAtesting is likely an inappropriate tool for diagnosing any form of immediate hypersensitivity. However, no studies have been performed to evaluate VEGA devices in food intolerance or aiding in the prescription of homeopathic and herbal remedies. Nevertheless, it is hard to envisage a unifying mechanism to explain how the test could perform these functions. Such issues can be addressed by appropriate randomised controlled trials.

From a legal perspective, in 2002 Health Canada suspended the licenses for the VEGAsom (License No.13264), VEGA Audiocolor (License No. 13267), VEGAselect (License No.13270) and VEGAtest Expert (License No. 14736), prohibiting the sale or importation of these devices. It remains to be seen whether health regulators will do anything to those licensed health practitioners who still use them. Furthermore, in the United States, no VEGA device can be legally marketed for diagnostic or treatment purposes without FDA approval (which they do not have). In 2001, the FDA notified the manufacturer and two distributors that they could not be legally marketed within the United States and banned the importation of such devices into the country. However, neither agency appears interested in confiscating the devices now used by practitioners.

Conclusion

VEGA testing is a technological technique of diagnosis with little scientific basis and such technology has been banned in both the United States and Canada. Nonetheless, it proposes to be useful in assessing a large range of conditions from allergies to cancer. Patients with ill-defined symptoms should approach such diagnostic methods with caution since there is a strong chance that the testing could lead to spurious diagnoses and/or inappropriate or delayed treatment.

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