

## Food allergy and alternative-complementary medicine.

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### Summary

The difficulties sometimes encountered in establishing a correct and sound diagnosis of food hypersensitivity, together with the belief that many pathologic conditions may be caused by or associated with adverse reactions to food, have led many patients to have recourse to non-conventional diagnostic techniques.

The aim of this paper is to describe the most common diagnostic techniques used in alternative and complementary medicine in dealing with food hypersensitivity. The available scientific data regarding each of these methods and their reliability are presented and discussed.

### Key words

Alternative and complementary medicine, food hypersensitivity.

A great number of diseases is believed to be related with the assumption of food by both patients and members of the medical community. However, there is no scientific evidence to support this belief (35). The importance of the topic is bespoken by studies (40) showing that about one fourth of American households modify their dietary habits because at least one member is perceived to suffer from food hypersensitivity (FH).

As for the pediatric population, the percentage of children under the age of 3 years who are believed to be allergic to food by parents varies from 28% to 43% (6, 12).

Many papers, however, have shown that the real prevalence of FH is far less than commonly perceived and reported by patients (20, 53, 60). In the general population the prevalence of FH is likely to be as high as 1.5-2% (19, 42). In the first few years of life the prevalence is quite higher, reaching up to 5-7% in children under the age of three (42, 43).

The conventional approach to the diagnosis of FH is based upon: 1) *medical history*: the correlation of FH suspected by history (42, 51) with the results of Double Blind Placebo Controlled Food Challenge (DBPCFC) is notoriously poor

(~ 30-40%); 2) *skin prick test (SPT) and RAST*: these tests are useful in establishing if the patient possesses IgE antibodies to specific foods. The negative predictive value (NPV) of such tests is excellent but the positive predictive value is much lower (41, 42, 43); 3) *diagnostic elimination diet*; 4) *food challenge*: the most definitive tool to diagnose FH is the DBPCFC which is considered, so far, the "Gold Standard" (7, 4) and the results of each and every test have to be compared to it. This methodology is complex, time-consuming and is to be performed only in specialised laboratories. However, even this test, like any other test in medicine, is subject to false positive (<1%) and false negative (~ 3%) results (9); 5) *atopy patch test*: this test seems likely to solve, at least partially, the diagnostic problems encountered in dealing with non-IgE mediated diseases. However, as yet, the test has not been standardised and the results reported by researchers vary considerably (52).

The difficulties sometimes encountered in making a diagnosis of FH in a simple, quick and reliable manner has led many patients to avail themselves of non-conventional diagnostic and/or therapeutic techniques. These techniques, are defined "*alternative medicine*".

However, some of them, like acupuncture, are time-honored and in some countries they are considered conventional and traditional.

The term alternative/complementary medicine (ACM) is preferred as it has no negative connotation.

ACM techniques are numerous and some of them are used in dealing with FH.

The aim of this paper is to analyse the scientific evidence of ACM techniques as well as their reliability in FH conditions.

*Epidemiological data.* In the general population the number of people who avail or have availed themselves of ACM is fairly high; in some countries the percentages are amazing: about 50% in Australia (32, 13) and the USA (5), up to 60-70% in Germany and France (14) and between 15.3% and 28% in Italy (49, 43).

In the pediatric population the available data show that 10-15% of children in the USA (11) and 53% in Denmark (31) have recourse to ACM.

The reasons why patients have recourse to ACM (44, 54, 56) are mainly dissatisfaction with conventional methods, the belief that ACM is less "invasive", less likely to make use of drugs and consequently safer in terms of negative side effects.

In many cases (36), patients have recourse to ACM unbeknown to their physician, but in 60% of cases these techniques are performed by doctors (44).

## Techniques

1) *Cytotoxicity Test (Bryan's Test)*. Cytotoxicity test (CT), first proposed in 1956 (50), before the discovery of IgE, is based on the assumption that the addition in vitro of a specific allergen to whole blood or to leukocyte suspensions brings about, in sensitised subjects, such morphological and qualitative/quantitative modifications of leukocytes as might lead to cytolysis.

The test is performed by centrifuging about 10 ml of blood in order to separate the leukocytes, which are first mixed with plasma and water and then applied to slides covered by a layer

dried allergenic extracts. The leukocytes are examined under an optical microscope at regular intervals for a period of two hours. Each and every change in the shape, aspect and volume of the leukocytes up to complete cytolysis is considered a sign of allergy.

An automated version of this test has recently been introduced. It is called ALCAT (web site: [www.alcat.com](http://www.alcat.com)), in which the test is presented as capable of identifying the agent responsible for FH in 86% of cases (98% in cases of intolerance to additives and preservatives). According to the information given on this site, it seems that 75-90% of the population suffers from "food and chemical sensitivity", which is responsible for the most varied conditions (panic attacks, acne, asthma, perennial rhinitis, diabetes, chronic fatigue, psoriasis, obesity, arthritis, frequent infections, muscular pains, inflammatory intestinal diseases, hyperactivity, eczema, anxiety, depression, migraine, compulsive craving for food and sugar).

It is possible to send a sample of blood to AMTL Corporation (1239 East Newport Centre Drive, Suite 101 Deerfield Beach, FL 33442) and have the test performed. Alternatively, the same organisation will provide the name of physicians in a position to perform the test in the geographical area of the patient.

NuTron Test, which is similar to ALCAT in some respects, is based on unspecified "activation" of neutrophils placed in contact with extracts of various foods (details are available at [www.nutron.international.com](http://www.nutron.international.com)).

*Scientific evidence.* Numerous studies carried out in the 70's have shown that CT is not easily reproduced (29). The test performed on the same patient but at different times have shown different results. Moreover, when performed in double blind, CT leads to a high number of false negative and false positive (2), which compromised its diagnostic reliability. The morphological changes in the leukocytes noticed in CT are probably due to variations in pH, temperature, osmolarity and incubation time (50).

In light of this and other experimental evidence, in 1981 the American Academy of Allergy claimed that CT was not reliable for allergological diagnosis (1). Research subsequent to the

official statement by the American Academy of Allergy confirmed CT 's unreliability (3).

**2) Specific IgG-IgG4 dosage and immunocomplex dosage.** Specific IgG-IgG4 dosage and immunocomplex dosage, strictly speaking, do not belong to ACM in as much as they are based on conventional concepts and tools. However, they are included in this review as their diagnostic reliability has never been officially acknowledged (57, 35).

In the U.S.A., some laboratories advertise and propose specific IgG-IgG4 dosage directed towards food and relative immunocomplexes (57) to their foreign and national clients.

Supporters of this test claim that the search for these specific antibodies may identify FH responsible for a high number of pathological conditions.

Many studies show that it is not unusual to find IgG after the normal intake of common foods, even if it is not possible to find a correlation between signs and/or symptoms of FH. The level of these antibodies and the relative immunocomplexes is correlated with the normal ingestion of the corresponding foods (34, 55).

**3) Provocation-neutralization test.** Provocation-elimination test (PET) may be defined both as a diagnostic and therapeutic technique (57).

PET is performed by administering the suspected food allergen intradermally or sublingually, after which the patient is kept under observation for a period of 10 minutes. PET is considered to be positive if the patient, after being exposed to the allergen, shows symptoms as bewilderment, dry mouth, difficulty in concentrating, headache and any other subjective symptom, all of which are considered important.

PET is not to be confused with tests of specific challenge with allergen, which is a diagnostic technique of traditional allergology. In such tests the allergen, standardized and at increasing dosages, is administered through mouth, conjunctiva, nose, bronchi, depending on the disease under investigation, and the results are evaluated on the basis of well defined clinical and/or instrumental parameters.

PET, on the contrary, has never been standardised; any symptom is considered a sign of posi-

tive response; negative controls are missing (21).

The second part of PET is used with a therapeutic aim and is performed reintroducing the antigen which proved to be positive in the first part of the test at lower or higher dosages, according to criteria that remain unspecified.

*Scientific evidence.* According to the studies carried out in the '70ies, it is impossible to reproduce PET (8, 10, 22). The results of such studies were confirmed in the '90ies (57, 58). In light of the above data, the Nova Scotia Environmental Health Centre (15) has stated that PET cannot be used as either a therapeutic or diagnostic technique.

Adverse reactions to PET, though rare, have been described. The most important reactions were angio-edema after applying allergenic extracts sublingually in a patient with IgE-mediated FH (18) and a very serious reaction due to the massive liberation of mediators following an intradermic injection in a patient suffering from an extensive skin mastocytosis (58).

**4) Pulse test.** Pulse test (PT) is based on the assumption that the sublingual or inhaling administration of an allergen in sensitized patients causes an increase in the pulse rate. A variation of at least 10 to 16 beats per minute is considered positive (39, 50).

*Scientific Evidence.* There are no clinical studies supporting or disproving PT reliability (57).

**5) Hair analysis.** Hair analysis (HA) has been used as a technique capable of revealing nutritional deficiency or imbalance and/or intoxication due to heavy metals. The aim of the test is to check if the hair shows traces of various minerals and oligoelements. In fact, on the basis of the results of the test, it would be possible to prescribe adequate dietary supplementation, mainly vitamins and oligoelements, so as to improve many pathological conditions (50).

*Scientific evidence.* The chemical analysis of hair has a limited but certain value in assessing prolonged exposure to heavy metals. However, in 1974 the American Medical Association stated that the well-being of the body may be independent of the physical-chemical condition of hair; consequently HA would be of little help to physicians (27). Recent studies carried out by

researchers of the California Department of Health Services have confirmed this opinion (47).

**6) Applied kinesiology.** Applied kinesiology is a diagnostic-therapeutic technique introduced by Goodheart (38) in 1964 and based on the assumption that any disorder of the body is accompanied by a reduction in the strength of certain muscular groups and that can be measured by means of specific techniques. During the execution of the test, the patient is lying on his back, raises one arm and keeps it perpendicular to the body, while he holds a glass tube with the suspected food in the other hand. The tester assesses the strength of the raised arm by pressing the patient's wrist. If the patient's resistance is won, the result of the test is considered positive.

There are numerous variations to this test:

a) the substance to be tested (17, 59) can be placed on the patient's chest or near the patient, but without contact;

b) "surrogate testing", (38) where a child's well-being is assessed by testing the strength of one of the parents keeping the child on his/her lap;

c) the substance to be tested is applied sublingually.

Another variation of AK is DRIA-Test (DT), a technique which was first introduced and developed in Italy with a view to making the assessment of muscular strength more objective.

DT is based on the assumption that sublingual or inhaling contact with the substance to which a patient is hypersensitive causes a reduction in his muscular force, which reduction can be measured with a special device called Driaton™.

Driaton is a seat with an adjustable back, so that subjects of all heights, even children, can fit in it. At the base of Driaton is a leather strap furnished with an ankle band linked to a load cell measuring the traction force exercised by the patient. The measurement is sent to a computer which processes the response. The patient sits on the seat, one ankle fixed to the leather strap, and is asked to exercise a traction equal to about 50% of the maximum possible effort he/she can make with his femoral quadriceps. While the patient is keeping his muscles contracted, a spe-

cial solution containing the substance to be tested is placed under his tongue. At intervals of a few minutes, the most common foods of a normal diet, including the most frequently used additives are tested. If after 3-4 seconds from the administration, in blind, of the offending substance there is a reduction in the force of traction exercised, then a non IgE mediated food hypersensitivity towards the above substance is hypothesized. The force reduction is not to be lower than 10%, is to occur with similar characteristics at every test with the same substance and is to be compared with a test in which a placebo is administered. According to the information given in the web site [www.driatec.it](http://www.driatec.it) DT is reliable in 96% of cases.

A diagnostic/therapeutic technique similar to AK is health kinesiology (HK), which was developed by Scott in the late '70ies and which is based on the principles of traditional Chinese medicine, i.e. acupuncture and kinesiology. The web site of HK, ([www.subtleenergy.com](http://www.subtleenergy.com)), supplies detailed information. The idea is that through muscular tests, HK can assess "the energetic condition" of the body and re-establish the right balance in case of imbalance.

A HK technique which is of interest in allergologists is the so-called Allergy Tap™. The patient applies the offending substance on specific points used in acupuncture in order to obtain a considerable improvement of the symptoms. Allergy Tap™ may be used before coming into contact with the offending substance or during an "allergic episode". According to the information given, the test is successful in 90 % of cases.

*Scientific evidence.* Recent studies (37, 30) have shown that it is impossible to reproduce AK, which is, moreover, an extremely subjective test, thus confirming data published in the late 80'ies (16, 24) and 90'ies (45). The European Academy of Allergy and Clinical Immunology (EAACI), in a 1999 Position Paper, claimed that the above techniques can not be relied upon to achieve a proper diagnosis (35).

It will be useful to point out that the International Council on Applied Kinesiology cautiously suggests the use of AK in addition to

the standard diagnostic tests and claims that it is inappropriate to base a diagnosis solely on muscular tests without the benefit of an objective test and/or conventional diagnostic techniques ([www.icakusa.com](http://www.icakusa.com)).

AK is not to be mistaken with kinesiology or biomechanics, which is a scientific subject studying movement.

**7) Electrodermic Tests.** Electrodermic Tests (EDT) are based on the principle that from reading the tissue electrical potentials we get useful information on their functioning (50). There are several types of instruments currently used for EDT and they all have the following elements in common (50):

- a) a source of electrical impulses (<1-1.25 volts, 7-17 microampères);
- b) a gauge of skin resistance gauged in a way that normal skin resistance of 100 kilo-ohms is placed in the middle of the measuring scale;
- c) a positive cable and a negative cable: the positive cable is connected to an electrode which is placed by the tester on various points used in acupuncture, while the negative cable is placed in the patient's hand.

The first to use EDT was a German physician, Voll, in 1958. He assumed that electrical variations in specific skin areas corresponding to reperi points in Chinese acupuncture might reveal pathological conditions in the corresponding organ or apparatus. The technique he developed was called EAV; information on this technique can be found on the web site ([www.eav.org](http://www.eav.org)). EAV was modified and simplified by one of Voll's students, Schimmel, who developed and realised the most famous and widely used EDT, i.e Vega Test (VT).

VT (23) consists of the following:

- 1) a galvanometer comparing the resistance between the skin in contact with the electrode held by the patient and the skin in contact with the positive electrode;
- 2) a source of electric power;
- 3) a metal honeycomb structure where sealed glass ampoules containing the extracts to be tested are placed. Such structure is placed in series with the electrical circuit, that is electricity goes through the ampoules containing the allergenic extract.

The patient holds in his hand one of the electrodes, while the other electrode is applied on points of his hand or foot. The equipment is furnished with a scale reaching a maximum of 80-100. At this point an extract is introduced and the measurement repeated. If there is a decrease of at least 15 units, the test result is considered positive.

The following names refer to variations of the test commonly available on the market: Accupath 1000, Biotron, Computron, DiagnoMètre, Ecllosion, Elast, Interro, LISTEN System, MORA, Natrx Physiofeedback System, Omega AcuBase, OmegaVision, Orion System, Prophyle, Punctos III and Vitel 618 (36).

*Scientific evidence.* According to one study (26) concerning patients sensitized to dust mites, VT can discriminate allergic from non allergic patients in 82-96% of cases. Some time later one of the authors of the above mentioned study (28) reached opposite conclusions. Many studies, in fact, have shown that EDT is unreliable in identifying allergic subjects. (21, 28, 48). A bioengineering study has proved that VT "readings" were not modified after the insertion of the ampoules containing the extracts, as glass is not an electrical conductor (38).

The Australasian College of Allergy (23) claimed that "Vega test has no scientific basis in the diagnosis of allergy; the use of VT can lead to inappropriate treatments useless private and public spending".

EAACI (35) too claimed that there is no scientific or clinical evidence that these techniques can diagnose food allergy.

**8) Bioresonance.** Bioresonance (BR) is a diagnostic-therapeutic technique based on the idea that the human body sends forth electro-magnetic waves which can be intercepted by means of an instrument called Bicom™. Reinforcing the natural oscillations by means of the same device and wiping out the pathological oscillations, it is possible to recover a state of well-being ([www.bioresonance.uk.com](http://www.bioresonance.uk.com)).

*Scientific evidence.* Recent studies have proved the unreliability of this technique both in children suffering from atopic dermatitis (46) and in adults suffering from allergic rhinitis (25).

**9) Nambudripad allergy elimination technique.** Nambudripad allergy elimination technique (NAET) is a diagnostic-therapeutic technique perfected in 1983 by Devi S. Nambudripad, a doctor specialised in acupuncture, chiropractic and kinesiology.

NAET ([www.naet.com](http://www.naet.com)) takes advantage of conventional tests, kinesiological tests and computerised techniques (NAETER). The patient is initially treated with acupuncture and/or finger pressure on specific points in order to eliminate “energy blocks”. After a few minutes, the patient is examined in order to find out the offending allergen, using the same techniques of applied kinesiology.

*Scientific evidence.* There are no studies specifically dealing with NAET (57).

### Conclusions

In conclusion, the review of ACM techniques used to diagnose food hypersensitivity and, generally speaking, allergic diseases, suggests the following considerations:

1) ACM tests are certainly attractive, quick and simple to perform and hardly invasive, while traditional diagnostics may be time consuming and demanding;

2) many of ACM tests are aimed at showing that certain foods or additives are responsible for the most varied pathological conditions. For some of these conditions like asthma, rhinitis, eczema, celiac disease, various malabsorption syndromes etc., a more or less important and/or constant relationship with food hypersensitivity is proven and generally acknowledged. For other conditions, however, such as chronic fatigue syndrome, irritable colon, hyperkinetic syndrome, joints symptoms, psychological/behavioural disorders, headaches, muscular pains, psoriasis, obesity etc., the relationship is either unproven or very rare.

In the latter pathological conditions, one or more of the following features are commonly found:

i) chronic condition;

ii) no simple test can lead to a definite diagnosis, which is often made ruling out other pathological conditions;

iii) no conventional treatment is effective in all cases;

iv) some of the above conditions may also show variations of the symptoms related to (or at least influenced and modulated by) anxiety and emotional strain.

According to the available literature (44), recourse to alternative techniques mainly occurs out of dissatisfaction with the results of “official” medicine (66.3%) or out of the desire “to try anything” (71.7%).

3) The use of techniques that have not been validated may imply prolonged dietary restrictions, which are costly and which may have serious consequences on the patient’s social life and nutritional well-being. It may also lead to think, mistakenly, that food hypersensitivity may be responsible for pathological conditions, with which hypersensitivity has no correlation, thus postponing a proper and timely diagnosis.

Knowing ACM diagnostic techniques as well as the reasons that lead patients to turn to them is of great help to physicians, who can, in light of the current scientific knowledge, explain to patients limits and risks of those techniques.

A well-grounded and unprejudiced explanation may improve the relationship between patient and physician, and the prescription of an accurate and reliable diagnostic course will consequently be made easier.

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