

Review article

Unproven diagnostic procedures in IgE-mediated allergic diseases

A considerable body of literature on therapeutic aspects of complementary and alternative medicine has been published in recent years, but little is known on diagnostic procedures. This short review lists complementary and alternative diagnostic procedures for the diagnosis of allergic diseases and presents an assessment of their usefulness for the daily practice. The review of the literature revealed that neither the determination of specific immunoglobulin G-antibodies in serum, the hair-analysis, the cytotoxic test, kinesiology, iridology, or electrodermal testing represent useful tests for the daily practice. To date, no complementary or alternative diagnostic procedure can be recommended as a meaningful element in the diagnostic work-up of allergic diseases. This is especially true for food allergy: properly performed oral food challenges still represent the gold standard for implementing specific diets in food allergic individuals. Ineffective diagnostic approaches may be costly for the consumer and delay appropriate therapy.

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Although a considerable body of literature on therapeutic aspects of complementary and alternative medicine has been published during the last years, little is known about diagnostic procedures in allergic diseases (1, 2, 3). Several unconventional methods have been said to be useful for the diagnostic work-up of food allergy or even superior to conventional methods. This short review aims to list complementary and alternative diagnostic procedures for the diagnosis of immunoglobulin (Ig)E-mediated allergic diseases (4) currently on the market and to assess their usefulness for the daily practice.

Specific IgG-antibodies

The determination of specific IgG-antibodies in serum does not correspond with oral food challenges (5). In cow's milk intolerance proved by oral challenge, no increased IgG-antibodies could be found (6). IgG milk-specific antibody levels are similar in children with early- and late-type clinical reactions (7). Furthermore, there is no evidence that IgG subclasses (8) or the IgE/IgG4 antibody ratio (9) are reliable diagnostic tools. A study of 27 children with hen's egg allergy found that children with a positive challenge tended to have a higher IgE/IgG₄ ratio and a higher IgG₁/IgG₄ ratio than those with a negative challenge test, but concluded that oral provocations are still necessary to confirm diagnosis of food allergy (10). A large study in 601 newborns, infants, children and adults showed that the determination of IgA

and IgM antibodies did not contribute to the diagnosis of food allergy (11). Since IgG-antibodies to common dietary antigens can be detected in health and disease (12), the determination of food-specific IgG is of no clinical relevance (13) and should not be part of the diagnostic work-up of food allergy.

Hair-analysis

While hair analysis has important uses in screening for metal intoxication, data do not support applications such as nutritional deficiencies or chronic diseases (14). In a British study, nine individuals proven to be fish allergic by oral provocations and nine healthy controls were investigated; blood was sent under two different names to several laboratories providing alternative methods including hair analysis. It could be shown that the majority of laboratories did not recognize the fish allergic patients; however, several other allergies were diagnosed for which no clinical indication could be found (15). In another study, hair samples of two healthy teenagers were sent under assumed names to 13 commercial laboratories performing multimineral hair analysis; the reported levels of most minerals varied considerably between identical samples, and six laboratories recommended food supplements, but the types and amounts varied widely (16). On an individual basis, the usefulness of hair analysis is restricted, with limitations in particular for evaluation of mineral nutritional status (17).

Cytotoxic test

The (leucocyte) cytotoxic test for food allergy is a blood test in which changes in the morphology of leucocytes are investigated under the microscope after adding antigen (up to 180 different food allergens per test) (18, 19). The test is time-consuming and dependent on subjective interpretation (20). Nine atopic and five nonatopic patients with or without food allergy were studied in a double-blind fashion with six determinations for each of 10 food antigens: reproducibility and correlation with clinical allergy was insufficient (21). Similar negative findings were reported in other large studies investigating aliquots blood samples in duplicate; the results fluctuated considerably from day to day and were without relation to the foods ingested (20, 22, 23). The cytotoxic test has no rational scientific basis (24), offers no reliable help in establishing the diagnosis of food allergy (25), especially for patients with multiple food allergies (26).

Kinesiology

In this test, the offended allergens are prepared in stoppered neutral glass bottles and the patient holds the bottle in one hand; a positive test is indicated by decrease in muscle power in the contra-lateral arm (27). While a noncontrolled pilot study claimed some value in the diagnosis of food allergy (28), a blinded study (performed in duplicate) in 20 patients, showed that the number of concordant results within duplicates was similar what would be expected by chance (27). A similar result was reported for patients with wasp venom allergy: kinesiology as a diagnostic tool was not more useful than random guessing (29). Applied kinesiology can also not be recommended for diagnosing nutritional intolerance (30).

Iridology

A study of iridology demonstrated that the diagnosis of bronchial asthma could not be assisted by an iridological style analysis (31). A systematic review on iridology revealed that the validity of iridology as a diagnostic tool is not supported by scientific evaluations (32). The possibility

of false positive and false negative may result in potentially harmful therapies or loss of valuable time for early treatment, which both represent serious problems (33). A Dutch study showed that the credence placed by doctors in iridology decreased after reading an empirical study presenting evidence against its value as a diagnostic aid (34).

Electrodermal testing

Although promoted in some studies (35), electrodermal testing (Vega), a technique similar to electro acupuncture according to Dr Voll (36), cannot be recommended for the diagnosis of food allergy, since it is without established scientific basis and may therefore lead to inappropriate treatment (37, 38, 39). In a double-blind randomized block design study, 15 volunteers with a positive result and 15 volunteers with a negative result on a previous skin prick test to house dust mite or cat dander were subjected to electrodermal testing; electrodermal testing could not distinguish between atopic and nonatopic participants (40). Another double-blind, placebo-controlled study in 72 allergic patients and 28 healthy volunteers on the diagnostic accuracy confirmed the lack of correlation to respiratory allergy (41).

Miscellaneous

The sublingual provocative food testing was not able to differentiate between placebo and food drops (42, 43, 44) and may even be potentially fatal in patients with systemic mastocytosis (45).

Conclusions

To date there is no complementary or alternative diagnostic procedure, which can be recommended as a meaningful element in the diagnostic work-up of allergic diseases. This is especially true for food allergy: properly performed oral food challenges still represent the gold standard for implementing specific diets in food-allergic individuals. Ineffective diagnostic approaches may be costly for the consumer and delay appropriate therapy.

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