Use and Abuse of Skin Tests in Allergic Conditions of the Respiratory Tract*

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Introduction

In recent years I have had the privilege of addressing chapters of the American College of Chest Physicians in Europe, Asia, South America, and my own United States. Almost all the members of these chapters are well versed in all branches of their specialty, with one exception, i.e. allergy.

For some reason the average chest physician (and also the average general internist) pays little attention to allergic factors. This indifference seems to apply even when the patient has a definite allergic condition, e.g. bronchial asthma, seasonal or perennial allergic rhinitis, nasal polyposis, allergic bronchitis and tracheitis, and including many cases of asthmatic bronchitis.

Most of these physicians seem content to make a diagnosis of bronchial asthma, for example, by the history, examination and clinical and laboratory tests. They try to find the cause of symptoms by the history and clinical trials, as by removal of the dog or cat. If that is successful they seem pleased, but most are content and go no further. If this halfway method does not reveal the cause of the asthma, those physicians who are not allergy-minded are apt to treat symptomatically by various medications, including antihistaminic and antibiotic drugs and oxygen.

The recent introduction of the steroid drugs (ACTH, cortisone, and prednisone) has given us an additional valuable tool in this field. Many physicians, however, including some allergists, are using these steroids much too often. Albert Rowe1 of California recently wrote me as follows: "I am very much afraid that the use of steroids is going to have a retarding influence. The challenge of physicians at the present time still remains in the actual determination of specific causes of these allergic manifestations rather than in their easy relief with steroid therapy."

Rowe is absolutely correct. Over these many years we have usually found the cause of the allergic symptoms by allergy survey, and have been able to relieve the symptoms in most patients by removing the cause as far as possible, with or without supplementary hyposensitization. In all fields of medicine we try to find the cause and to remove it—why should we not use every effort and follow every clue in the field of allergy as in other branches of medicine?

*Presented at the Fourth International Congress on Diseases of the Chest, American College of Chest Physicians, Cologne, Germany, August 19-23, 1956.

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Fortunately, we have excellent methods for investigating bronchial asthma and other allergic conditions. Our first question is, "What is the diagnosis?" Our second question is, "What is the cause?"

We urge all physicians to look for allergy in every patient who has chronic or acute dyspnea, or who has chronic or acute rhinitis, sinusitis, bronchitis, or laryngitis. That patient is entitled to a thorough allergy survey. This includes a search for:

(a) History of some allergic condition in the patient or his family.
(b) Eosinophilia in the blood, sputum and/or nasal smear.
(c) Seasonal aspects or incidence.
(d) Clinical tests, e.g. removal of a dog or of egg-containing foods.
(e) Skin tests.

We recommend that all internists, including those especially interested in chest diseases, carry out skin tests in all patients who are allergic or suspected of being so. If the physician cannot carry out these tests himself, he is duty bound to refer the patient to another physician who is equipped with skin test material. That doctor should make the allergy survey, and, if desired, return the patient to the referring physician, along with a letter outlining precautions against house dust, pollens, foods, fungi, animal danders, etc. The allergist should also send any necessary extracts, with dosage schedules, if hyposensitization (desensitization) is deemed advisable; and, if possible, he should see the patient from time to time to give stronger extracts and to make sure that the patient is actually following orders.

Chest physicians will be well advised to give more attention to allergy, e.g. to learn more about local pollens and fungi, and to note both allergic and psychic conditions when they visit a patient's home. They should attend lectures and courses in the field of allergy and read more papers on this important subject. Approximately 10 per cent of the population is allergic in one way or another.

Now let me mention briefly something about the good and the bad points of skin tests themselves.

Techniques

Skin tests are usually carried out either by scratch or intracutaneous methods, or by both. Information can also be obtained by using the passive transfer technique, by conjunctival and nasal tests, and by clinical experiments.

Skin tests offer us a valuable short cut, and often reveal causes which cannot be found even after a searching history and clinical trials. All positive skin tests, however, must be corroborated clinically.

A. Scratch (Cutaneous) tests were first carried out by Blackley of England in 1873, with positive reactions to grass pollen in those who had hay fever and/or asthma during grass-pollinating seasons. Previously, however, Hyde Salter had noted positive reactions in his own skin from the scratch of a cat's paw. In this century rapid progress has been made in skin testing. In 1912 Schloss, found positive reactions...
in a child who was allergic to egg, almond, and oat. Walker\(^6\) in 1916 reported 400 patients with asthma, and divided them into two groups: sensitive, with positive skin tests, and nonsensitive, in whom the scratch tests were negative.

Scratch tests have proved extremely valuable all through these many years. They are not perfect, but they are widely used, are safe, and can be done easily. The materials are either liquids which are rubbed into a scratch, or powders which are dissolved with N/10 sodium hydroxide and then rubbed into the scratch.

B. The Intracutaneous (Intradermal) Method was started and popularized by Cooke and his associates\(^6\) in 1915. Their students have continued to use this intradermal method; those who followed Schloss and Walker have used the scratch technique. For many years controversy has existed between the exponents of these two procedures, and even to this day many allergists use only one or the other. Fortunately, most of us have learned the good points of each method, and we use both techniques.

Intracutaneous tests are done with sterilized solutions, needles and syringes. Larger reactions are usually obtained by these injections into the skin, and frequently we find a positive intradermal test after a scratch test for the same allergen has been negative.

Systemic reactions and even death have occasionally occurred when intradermal tests have been made without a previous negative scratch test. Swineford,\(^7\) for example, reported death in one patient and anaphylactic shock in another—both received intradermal tests with a mustard extract and neither patient had previously been tested for mustard by the scratch method. Swineford concluded his article by stating, "Every intradermal test should be preceded by the less sensitive scratch test."

We believe that scratch tests should be made first. If that technique gives us enough information, intradermal testing is not necessary. For example, if hay fever and asthma occur each year when the grasses are pollinating, and if scratch tests are strongly positive for the various grass pollen extracts, intradermal testing with these extracts is not necessary and, in fact, could cause systemic reactions. If, however, scratch testing does not yield sufficient information, testing by the intracutaneous method must follow, and will frequently be successful even though the scratch test was negative. To solve some allergic problems, one frequently has to use every available method, just as one does who tries to solve a murder mystery. The allergist is a detective.

C. The Passive Transfer method was invented in 1921 and named after its authors, Prausnitz and Küstner.\(^8\) "The substance responsible for the immediate positive skin reaction in hay fever and asthma is present in the patient's blood and can be transferred to and fixed in a normal skin by an intracutaneous injection of the patient’s serum. This antibody, designated as atopic reagin by Coca and Grove,\(^9\) is specific for each atopen" (Walzer\(^10\)).

This indirect method of testing by no means takes the place of the
usual scratch and intracutaneous techniques. It need be used only occa-
sionally, when direct testing is impractical, especially when the patient's
skin is covered with eczema or cannot be used because of severe
dermographia.

D. The Conjunctival method is occasionally used to test pollens,
fungi, or animal danders, but is only tried when both the scratch and
intracutaneous techniques have proved negative.

E. The Nasal method can be tried with such materials as fungi or
perfumes.

Value of Skin Tests in Allergy of the Respiratory Tract

Skin tests are indispensable in these allergic conditions. Positive re-
actions are usually obtained when the history indicates allergy to a
specific food or inhalant material, and when the test is positive the
patient's suspicions are verified to the satisfaction of the patient and
the physician. Some physicians seem content with the patient's observa-
tion that egg, for example, causes his asthma. Occasionally, in such a
case, the skin test to egg extract proves negative both with the scratch
and intradermal techniques—and then one looks for a different cause—the
asthma may be due not to the egg but to bacon which has been in the
same pan.

No physician has time or inclination to ask regarding every possible
cause for symptoms. In one of our patients, for example, we were able
to relieve asthma by removing a dental adhesive used to keep his upper
plate in position. This adhesive contained karaya gum. The patient
gave a four-plus reaction to karaya gum extract which we had not
previously suspected. Cottonseed protein is a rather frequent cause of
severe asthma, yet the cottonseed-sensitive patient does not suspect this
unless he has had previous skin tests. Removal of cottonseed and impure
cottonseed oils usually brings almost immediate relief. Some patients
complain of hay fever, but their seasons may not be exactly synchronous
with those of the usual pollens; in such cases skin tests frequently indicate
that molds and smuts cause or aggravate symptoms, and the patient
needs hyposensitization with extracts of these fungi, instead of pollen.

Skin tests are not infallible. Occasionally they are negative even
though clinically one can prove that the patient is allergic. In other
cases, especially with food extracts, positive skin tests may occur, yet
are unrelated to the cause of symptoms.

The positive skin test constitutes just another clue, but a valuable
one. It usually indicates a clinical allergy, but this allergy may be past,
present or future. The student of allergy soon learns this fact, and he
also learns that positive skin tests in dermographic skin must be
minimized.

He also learns that skin tests are frequently lessened in size or absent
in asthmatic patients who are receiving such medication as ephedrine,
epinephrine, or antihistaminic drugs. He therefore postpones skin testing
in such cases until these drugs are presumably out of the system (three
to seven days).
USE AND ABUSE OF SKIN TESTS

Nevertheless, and despite these relatively slight limitations, skin tests, when well done and thoroughly carried out, are indispensable in the field of allergy of the respiratory tract.11

SUMMARY

1. The average internist, including those who specialize in chest diseases, has more or less neglected the field of allergy. He is apt to try to find the cause by history and clinical tests alone, and to disregard skin tests.

2. Skin tests, when properly carried out, and despite some minor limitations, are extremely valuable in discovering the cause or causes of allergic conditions, especially those of the respiratory tract.

3. Scratch tests should first be carried out, and then intracutaneous tests should be done when more information is necessary. We condemn those who use only one or the other technique.

4. Physicians who are not equipped to carry out skin tests should refer their allergic patients to an allergist who will make the allergy survey, and who will return the patient, if desired, with full instructions as regards avoidance of causative factors, and with solutions and dosage schedules if hyposensitization is necessary.

RESUMEN

1. Habitualmente, los internistas, aún los que se especializan en enfermedades del tórax, descuidan más o menos el campo de la alergia. Se inclinan más a buscar las causas por la historia clínica y por las pruebas clínicas, y pasan por alto las pruebas cutáneas.

2. Las pruebas cutáneas, cuando se hacen bien, a pesar de algunas limitaciones de menor importancia, son extremadamente valiosas para descubrir la o las causas de los padecimientos alérgicos, en particular los de las vías respiratorias.

3. Primero deben hacerse las pruebas con erosión cutánea y después las reacciones intracutáneas cuando se necesita una información más. Nosotros condenamos el uso de sólo una o la otra técnicas.

4. Los médicos que no están equipados para realizar las pruebas cutáneas deben enviar sus enfermos al alergista quien hará la investigación alérgica y devolverá el enfermo si así se desea con instrucciones completas en lo que respecta a evitar las causas así como dará las soluciones y dosificaciones para obtener las hiposensibilización si se necesita.

RESUME

1. Dans l'ensemble le médecin, y compris celui qui se spécialise dans les affections thoraciques, néglige plus ou moins le domaine de l'allergie. Il est susceptible de tenter de rechercher la cause par l'histoire de la maladie et les seuls éléments cliniques, mais a tendance à mépriser les tests cutanés.

2. Les tests cutanés, lorsqu'ils sont pratiqués avec soin, et malgré quelques contraindications mineures, sont du plus haut intérêt pour découvrir la cause des états allergiques, particulièrement ceux des voies respiratoires.
3. On doit d’abord essayer les cuti-réactions et ensuite s’il est nécessaire d’avoir des renseignements complémentaires, on peut pratiquer des épreuves intradermiques. Les auteurs n’admettent pas que l’on utilise seulement l’un ou l’autre de ces procédés.

4. Les médecins qui ne sont pas équipés pour pratiquer des tests cutanés devraient adresser leurs malades allergiques à un spécialiste qui effectuera la recherche de l’allergie, et qui renverra le malade avec les instructions qui permettront d’éviter les causes déclenchantes, ainsi que les conseils thérapeutiques si la désensibilisation est nécessaire.

ZUSAMMENFASSUNG

1. Der durchschnittliche Internist einschliesslich eines solchen, der sich für Thoraxerkrankungen spezialisiert, hat das Gebiet der Allergie mehr oder weniger vernachlässigt. Er neigt dazu, die Krankheitsursachen aus Vorgeschichte und klinischen Untersuchungen allein zu ermitteln und Haut-Teste ausser acht zu lassen.

2. Werden Hautproben richtig ausgeführt, so sind sie trotz einiger unbedeutender Einschränkungen von ausserordentlichem Wert für Feststellung der Ursache oder Ursachen allergischer Krankheitsbedingungen, vor allem solcher des Respirationstraktes.


4. Ärzte, die nicht über die Ausrüstung verfügen, um Hautproben auszuführen, sollten ihre allergischen Patienten an einen Spezialisten für Allergie überweisen, der, falls es gewünscht wird, die Patienten zurück-schicken wird mit genauen Angaben hinsichtlich der Vermeidung ursächlicher Faktoren und mit Arzneimittellösungen und Dosierungsplänen, falls eine Desensibilisierung notwendig ist.

REFERENCES