

SOME CONSIDERATIONS OF ALLERGY, TRAUMA, INFECTION AND NASAL RECONSTRUCTIVE SURGERY

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There are widespread deficiencies in our knowledge of many syndromes of anatomical, disease, genetic, endocrine, and environmental complexes and the inexhaustible multiples of these which are possible (Williams). These large gaps in our collective knowledge are frequently hidden or partially concealed by diagnoses such as "Allergy, Eczema, or Ménière's disease". While some of us have a clear concept of what we think these terms mean, they consistently turn up to camouflage an inadequate history or workup and lead to failure to make the correct diagnosis (Williams).

Hormonal dysfunction in protein metabolism has been said to be the root of the mechanism of allergic symptom complex manifestations. Consideration of possible metabolic error might be a good place to begin one's evaluation of the total person after obtaining the patient's complaints and taking a careful history (Godlowski, 1965).

Proteins are normally absorbed into the blood serum from the gut or any mucous membrane (Willoughby) and are distributed to the body cells. When proteins penetrate the cell wall of the normal organism normal proteolysis results in non-toxic catabolites. Thyroid stimulating hormone activates the production of T₃ (cytomel) and T₄ (syntroid) which stimulates proteinase activity so we have the diencephalon, hypothalamus, pituitary, and thyroid glands involved in normal cellular metabolism.

Some individuals have a tendency to develop an abnormal type of metabolism of proteins and some of the intermediate products of protein proteolysis causing this type of abnormal response are termed antigens. It is generally conceded that amino acids and peptides are not antigenic but there is uncertainty about peptides and polypeptides. Proteins and proteoses are conceded to have antigenic capability. The tendency to develop damaging reaction to protein material is termed individual susceptibility of allergy (Williams).

Parallel to hypersensitization a reaction of immunity may take place with the production of antibodies. Godlowski does not believe that antibodies are involved in hypersensitivity reactions but that the individual susceptibility and the antibody type of immune reaction are non-interfering although they may be synchronous. Hypersensitivity may occur in the absence of the immune reaction and vice versa. This accounts for the false negatives and false positives of flare and wheal skin tests. The lack of clinically significant positive skin tests prompted Rinkel (1962) to adopt provocative tests.

There may be a fundamental difference between immediate type inhalant allergies or atopies and the delayed type of reaction. It has been suggested

that atopy is an auto-immune reaction and that therefore antibodies may play a part in the reaction. In delayed type allergy or true individual susceptibility which is characteristic of foods, mold spores, hydrocarbons, house dust, and other chemical sensitizers, antibodies have not been demonstrated although owing to the ability to transfer susceptibility by cells, antibodies fixed to the cells have been hypothesized.

In allergic sensitization we find abnormal adapted enzymes called toxic enzyme systems with resultant incomplete proteolysis resulting in toxic metabolites. In food allergy there is usually an abrupt onset as a rule (Williams, 1966). Inhalation allergy is stated to have a gradual onset although E. L. Binkley, Jr. observed an infant forty-five minutes after birth with objective findings of inhalant allergy (Williams, 1966). There is evidence of placental transfer of antigen but not to foods, mold spores, and house dust with delayed type reactions where antibodies have never been convincingly demonstrated. "Inborn Error of Metabolism" by Hsia suggests the possibility of severe clinical abnormality due to the enzymatic dyscrasia. Godlowski (1962) states examples of such an inherited abnormality in anaphylactic hypersensitivity are atopic dermatitis, certain types of bronchial asthma and hayfever.

In any therapeutic program for individual susceptibility (allergy) deficiencies in hormonal physiology must be considered and "biochemical stress" must be removed (Williams, 1966).

Randolph has clearly demonstrated intolerance to chemicals in which no one has suggested that there is an antibody-antigen reaction. This reaction to chemicals would indicate that Godlowski is probably correct in his hypothesis that hypersensitivity and immunity are parallel phenomena which have nothing to do with one another. This does away with the puzzle as to why positive skin tests are not present in 100% of tests even in atopy and why there are so many false positives and false negatives in all skin testing. He further believes some patients become sensitized to the products of their own tissue; toxic catabolites produced by previous operations or injuries. According to Fowler, some may have developed tissue hypersensitivity as a result of nerve injury and changed capillary blood flow (Williams).

Children with dyscatabrosis (reverse swallowing), (tongue thrust), and thumb sucking are in need of allergic diagnosis and management. There is a lack of mandibular support of the upper jaw in mouth breathers. These patients present high arched palates and protruding, front teeth with related structural changes (Williams, 1966). A similar condition, diastema, with abnormal growth of the upper teeth is seen as a result of nasal injury. The base views present round nostrils, evidence of rhinorrhea and obstruction to nasal breathing. The turbinates are hyperplastic and the septum is deviated.

Although one might conclude erroneously that all children with dental and palatal changes are allergic, such patients frequently may have a negative "allergic survey". Following surgical correction of anatomical defects and after proper training, they may become normal nasal breathers and do not tend to relapse.

It would, therefore, be very easy to conclude improperly, in the absence of an allergic workup, that one had indeed corrected an allergic state by septal or nasal reconstructive procedures. More probably these patients were having responses to neurogenic reflexes via the sphenopalatine ganglia from ab-

normal stimuli due to abnormal turbulence, drying from increased air flow or jet air streams and/or spur pressures with nerve network stretch phenomena and resultant turbinal congestion. Most of us have witnessed, during surgery, the sudden change that will occur in an occasional patient at the time of spur removal and release of mucosa and nerve tension. We have heard the patient say such things as "the headache is gone", "the pressure in my head is relieved", "I feel better", and even with a pack in the nose they sometimes will allege that they can "breathe better".

Before continuing the consideration of allergic noses with open valves, polypi, atrophies and other changes, it would be advisable to consider briefly environment influences that can produce abnormal responses which may be better thought of as individual susceptibilities rather than allergies (Randolph, 1962). These environmental incitants may be airborne particles, foods, and food fractions, and/or man-made chemicals. Susceptible individuals may react adversely with localized dermatitides, headache, fatigue, myalgia, arthralgia, fluid retention and a wide range of mental and behavioral abnormalities (Randolph, 1962). Only after exhaustive studies and therapeutic trials including elimination of focal sinusal infection may one consider that nasal reconstructive procedures are indicated.

History is the most important single tool in the diagnosis of the allergic patient. While it is by no means infallible, one may come to some very rapid conclusions in the following manner:

1. Is it seasonal, and if so, that are the dates of onset? If the dates of onset are associated with the pollination of trees and grasses of a geographic area, one may then treat without actually testing.

In the Pacific Northwest the spring pollen season usually begins in mid-March or April and consists primarily of Alder. A skin test for Alder sensitivity should be made in the winter months and desensitization begun February 1st. The summer pollen season usually begins in May or June and consists primarily of orchard grass, tall oak, velvet, Italian rye, perennial rye, native blue grass and bent grass. Thus, empirically on the history and without testing, we are privileged to assume a spring or summer sensitivity or one which is mixed and treat accordingly with a stock vaccine. The spring mix is composed of velvet grass, perennial, orchard grass, tall oak, and Italian rye in 1 : 100 dilution. Added to it may be any other substances which are considered desirable. The summer mix includes a mixture of bent grass, timothy, native blue grass, English plantain, and red rout pigweed. When improvement is not apparent more dilute strengths are used until there is subjective improvement.

2. Next we ask, is it continuous, and if so, are there times when it is more severe? Those which are continuous or worse in the winter may be presumed to be dust and/or mold allergies and are treated accordingly. Nasal allergies due to dust or pollens will show an eosinophilia in the nasal smear technique of Hansel, unless a severe infection is present concurrently. Eosinophils may also be found in antral washings. These cases may be treated by a desensitization program with dust and/or molds and improving of the environment of the patient.

H. L. Williams suggests a classification of chronic sinusitis into three types which are distinguishable by history and clinical examination alone:

- a. Chronic bacterial (suppurative) rhinosinusitis,
- b. Chronic allergic rhinosinusitis,
- c. Chronic hyperplastic suppurative rhinosinusitis which is the end result of severe prolonged perennial allergy complicated by infection.

Type "A" is usually limited to a single sinus or a group of sinuses and is secondary to viral upper respiratory infections or poor drainage and ventilation of the involved sinus or sinuses present. A substantial percentage of these cases are secondary to periapical abscess of a molar tooth.

Type "B" usually involves all of the sinuses and is of short duration as it becomes type "C" if it persists for any length of time.

Treatment of the hyperplastic sinusitis is both surgical and medical. They are given antibiotics, antihistamines, decongestants, and advised regarding the avoidance of known or suspected allergies. This includes educational process regarding the dust free room.

Guggenheim prescribes at once, without testing, a comprehensive hypo allergenic diet supplemented by large therapeutic doses of vitamins.

Surgical removal of hyperplastic tissue via Caldwell-Luc, antral window, and polypectomy will result in a rapid convalescence. H. L. Williams prefers dry suction to post operative antrum irrigations or other displacement methods. Intensive allergic care is important during this post operative period.

The history may also reveal a Histamine sensitivity or the patient may describe a migraine headache. These are usually unilateral and recurrent; they may occur at night. They may present a transient scotomata associated with nausea. The patient looks healthy and has negative sinus x-ray films. Nasal antral pressures are normal.

Allergy causes both migraine and histamine headaches. Migraine is localized along the distribution of the external carotid, and the histaminic variety localizes along the internal carotid. They are not associated with reading or eye work. The nose is clear. They are episodic, rapid in onset, very severe, of short duration, and present conjunctival congestion of the homolateral eye with epiphora.

While any food may cause an allergy, either in children or adults, certain substances are more suspect. In children we screen for ingestion of too much peanut butter, chocolate, milk, wheat, eggs or orange juice. In many cases of intractable allergies in children one will find that the underlying cause will be the presence of dogs or cats or both, or other pets in the house. These must be removed before the allergy may be resolved. An allergenic routine diet may also be used as advocated by Guggenheim.

While adults also have trouble with the same food allergies, they usually eat whole nuts rather than peanut butter. Dairy products include more copious quantities of ice cream, cheeses and other milk containing foods. They especially need to be screened for over ingestion of pork, alcohol, corn, oranges and grape juice. Special scrutiny needs to be placed on their ingestion of coffee, tea, tobacco, personal habits and the keeping of pets in the house. Cosmetics, including hair sprays, frequently are found to be one of the etiologic agents.

The history will also show many of the ecological causes of vasomotor rhinitis and the questionnaire of Randolph is quite valuable for this purpose, and also to determine whether an hydrocarbon sensitivity is responsible for the

symptoms. Treatment and patient improvement in food allergy and ecological sensitivity are usually dependant on elimination or removal of the offending food or other organic substance.

Hydrocarbon sensitivity may be improved by the elimination of all gas cooking and heating appliances. Charcoal filters in the air conditioning system of the house and automobile will greatly improve those afflicted.

In one form of clinical allergy, active manifestations cannot be controlled unless, and until, the infections superimposed upon the allergic reaction are eliminated from the target organ or from organs secondarily involved in the inflammation (Godlowski, 1962).

Gross anatomical deformities and chronic sinusitis demand surgical correction whether allergic manifestations are present or not. Allergic management will be unsuccessful in these cases without surgical intervention and vice versa. (Postoperatively, "allergic treatment seemed more effective") (ARS Questionnaire 7. Reports on 441 cases presented by M. H. Cottle and K. H. Hinderer at 7th Congress Int. O-R-L Paris 1961), but must be continued indefinitely. Surgical indications:

1. Deviated septa + + + to either side and may be considered obstructive in
 AREA 1) Vestibular
 AREA 2) Valve
 AREA 3) Attic
 AREA 4) Mid Turbinate
 AREA 5) Posterior Turbinate (Cottle, 1959)
2. Septal spurs, impactions, or deviations producing vascular reflexes through nerve 5 or the sphenopalatine nerve.
3. Lesser septal deviations at the valve (area 2).
4. Redundant septa with anatomical dysharmony and tension stress.
5. Sagging or saddling of the cartilaginous vault secondary to trauma, infection, or surgical assaults.
6. Tilting of the bony and/or cartilaginous pyramid with a relative deviation to the opposite side.
7. Wide lobules with or without excessive alae and/or lobular cartilages.
8. Nasal atrophies.
9. Maxillary ostium region insufficiency.

An allergic individual may concurrently have altered nostrils, sagging cartilaginous vault, open valves, and evidence of atrophy. One may expect to have an improvement in respiratory allergies including asthma for one to two years after surgical re-arrangement of anatomical components. This indefinite improvement interval is directly dependent on hormonal physiologic responses and environmental factors. (95% showed an improvement in their allergies, but after six weeks began to revert to their former allergy status (ARS Questionnaire 7). (5% were worse postoperatively) (ARS Questionnaire 7). These cases are presented as typical of what may be expected. In none have we cured the allergy, but in most cases the patients have reported improvement. This was more marked for the first two months following which it diminished markedly, but some patients reported they were still improved a little after two years. (50% had a lasting definite improvement in health outside of the symptoms of allergy (ARS Questionnaire 7).

The surgical management of allergic cases demands attention to the post-nasal area. Some of the treatable conditions that may be diagnosed as ehyper-trophied or hyperplastic adenoid tissue, either primary or recurrent, posterior

polypi, and "raspberry" edematous posterior tips of the inferior turbinates (Williams, 1966). In addition to the removal of the "Biochemical Stress" of infection and individual susceptibility (allergy), one must contemplate and institute polypectomy or adenoidectomy when indicated. Subserosal injection of 0.5 cc of Hydreltra TBA into the hypertrophic turbinal tissue is deemed advisable when these tissues fail to respond to other medical and/or allergic management. This is more effective and more conservative than surgical attacks on the turbinates. The reflex relationship between the anterior and posterior tips and that of the central segments of the turbinates and the interior of the antra are preserved by this technique.

If inflammation, infection, allergy, and/or injury of the nasal tissues are severe enough they will provoke enough constitutional stress to stimulate the pituitary-adrenal axis and start Selye's alarm reaction. This puts into play systemic reactions that in turn send impulses to the hypothalamus. This, in turn, stimulates the anterior pituitary to secrete corticotropin or ACTH. The increased ACTH stimulates the adrenal cortex to secrete the cortical hormones, glucocorticoids, which are predominantly hydrocortisone. This is the "stress hormone". If the local reaction produces enough systemic stress, enough hydrocortisone is produced to inhibit edema and lessen the inflammatory reaction. If not, one must recognize the imbalance and supply the necessary medications in order to prevent excessive inflammatory and allergic reactions (Cottle, 1961). An appreciable increase in the eosinophil count postoperatively indicates this probability.

In cases of gross hormonal deficiencies, the patient must receive an adequate supply of anabolic hormonal supplement. Most suitable allergic surgical cases are not severe and will respond the best in the areas of healing by using prednisolone mgm 5 4x's daily for seven days and tapering off to cessation of the supplement in from three weeks to three months (Williams, 1966). In some cases a local nebulized gluco-corticoid may be used as a nasal spray for several weeks. Cytomel (T3) will activate proteolytic enzymes in all cells including those in the shock organs and help to proteolyze undesirable substrate in the tissue cells.

Concurrent use of vitamins and minerals and an adequate supply of essential proteins will strengthen the tissue response favorably. Control of the hypothalamus as the central relaying organ may be achieved by tranquillizing agents of the autonomic suppressant type. All of these cases receive phenergan 25 mgm, b.i.d. for three weeks for the purpose of ameliorating or reducing edema. (2% had postoperative inflammation and infection of the subcutaneous and submucous tissues (ARS Questionnaire 7).

The immediate use of antiseptics and high dosage antibiotics for one or two weeks is beneficial postoperatively. The microorganisms most likely to cause infection in the nasal mucous membrane are viruses and staphylococcus aureus. Always under consideration are hematoma, foreign bodies, excessive soft tissue injury, as well as the maintenance and preservation of strict surgical asepsis. Continued therapy with a different antibiotic may be of value in some cases after ten to fourteen days. Infection, allergy and trauma each predisposes nasal tissues to the deleterious effects of the others.

In conclusion, we have all seen those cases in which the symptoms have been markedly or completely improved by allergic or environmental manage-

ment and control. We, further have seen the disappearance of nasal polypi, and/or enlarged adenoid tissues through the use of antibiotics, and/or steroids, decongestants, irrigations, and antihistaminics. These cases of anatomical dysharmony, malarrangement, and/or metaplastic, and/or atrophic changes that still have pronounced symptoms, and are otherwise resistant to treatment or management should be considered for surgical correction.

SUMMARY

A properly functioning nose is essential to the mental health of the individual. Nasal alarm reactions may occur suddenly. The nasal form will precipitate neuroses when it does not conform to those standards which the possessor believes to be most desirable. Somatopsychic neuroses may result from hypoxia as a result of reduced neural stimulation in breathing due to crusts or low velocity air currents. Nasal neurosis may arise in the normal course of the pursuit of health and happiness. Treatment is one of understanding of the basic problem and doing something about it.

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