ANGIO-NEUROTIC EDEMA AND CERTAIN VASO-MOTOR AND TROPHIC DISTURBANCES OF THE MUCOUS MEMBRANE OF THE RESPIRATORY TRACT.

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The features of clinical similarity between certain affections of the skin and mucous membrane must have been apparent to all and it is to be regretted that they are so rarely studied together. This paper, presented mainly from the standpoint of laryngology, will exhibit many defects under criticism from neurologist and dermatologist. As an introduction to the subject a well studied skin affection will be briefly described.

Angio-neurotic edema: It may be defined as: "An affection characterized by the occurrence of local edematous swellings, more or less limited in extent, and of transient duration." The characteristics of the disease may be briefly enumerated as follows: The edema appears suddenly and is usually circumscribed. The face, backs of hands, legs, or throat may be the seat of swelling. Periodicity is often a characteristic. Heredity may be noted. Itching, heat or redness may or may not be present. It is serious only when the throat is invaded. Gastro-intestinal disorder often accompanies the attack.

The similarity of this affection to *urticaria* is apparent. There is this essential difference, however: In the one there is a definitely localized persistent vaso-motor instability, and in the other the area involved is shifting, the attacks intermittent, and there seems to be a vaso-motor irritability responding to certain irritants probably from the gastro-intestinal tract.

In order that comparisons may be made between these skin manifestations of vaso-motor disturbances and analogous mucous membrane affections the more rare disease will be further described by the narration of a case.

A young man of twenty-nine years, of good parentage and excellent general health, has been affected with a daily edematous swelling over the nose for more than twelve years. Prior to that

time he had attacks of "rush of blood to the head" which subsided as the skin trouble came on. Occasionally the ears have been similarly affected. Careful examination fails to disclose any determining causes. In fact the site of the diurnal blossom has literally scared him into decidedly temperate habits. The swelling appears early in the forenoon, being brought on by hot drinks of any kind and work in a stooping posture. There is redness, but little irritation. The edema often involves the tissues within the vestibule of the nares, but further than this there is no intra-nasal abnormality. The swelling subsides rapidly after a few hours and he is never troubled at night. He admits indiscretions and sexual excesses during adolescence and for sometime thereafter.

It is simply an instance of vaso-motor instability due to disturbed development at puberty, and the cerebral congestions were probably the primary symptoms.

Keeping these two types of angio-neuroses of the skin in mind a detailed description of analogous angio-neuroses of mucous membranes will be attempted. The term *hydrorrhea*, and edema being more expressive will be used instead of vaso-motor rhinitis or angio-neurotic edema. There are several more or less distinct types of vaso-motor disturbances of mucous membranes which will be considered.

Reflex type. In its simplest form this is very easily comprehended, but the indirect and remote channels of reflexes are so complex and labyrinthine in character that an attempt to define would only add to the existing confusion. Fortunately many of our vague and cloudy ideas on reflexes are clearing up by the influence of advanced studies in bio-chemistry. A simple case of reflex nasal *hydrorrhea* will be narrated.

An old gentleman became suddenly afflicted with sneezing, and a copious watery discharge from the nose. The flow of sero-mucus was excessive and almost constant. He had never had similar trouble, and ordinary treatment for several weeks had failed to give relief. On examination of the ears the source of reflex irritation was found. Inspissated cerumen was pressing on the tympanic membrane and its removal gave immediate and permanent relief.

Vaso-motor rhinitis will likewise be considered briefly. The exciting cause comes from without the system, and mucous membrane irritability and vaso-motor instability are the predisposing conditions. There is a condition following in the wake of hay fever in which structural changes in the membrane and vaso-motor habit seem prominent. This is characterized by persistence of the edema and *hydrorrhea* and stenosis into the winter months. Vigorous tonic treatment, especially the judi-

cious use of cold water, will break up the habit. In some cases the persistent edema of the tissues has weakened the connective tissue stroma, and advanced trophic changes occur, resulting in pendulous turbinates or polypi. These conditions are mentioned to impress the gradation of vaso-motor into or structural trophic abnormalities. It is often difficult to decide clinically where the latter begins.

Neurasthenia is the constitutional condition which expresses itself in a great variety of vaso-motor disturbances. It will be considered under the *acute or periodical* type and the *persistent or chronic* type. To emphasize the importance of careful study of these cases one will be narrated:

A young lady, a gifted legal stenographer, was carrying on literary studies in addition to her daily routine work. Gradually she became afflicted with attacks of nasal hydropnoea and edema, irregular in periodicity and increasing in severity. She was advised to drop all extra work but did not heed. The daily attack was very sudden in onset, often beginning before rising in the morning, but sometimes late in the afternoon or evening, and, lasting an hour or so, would subside quickly. During this period sero-mucus would flow from the nose so freely that she would substitute a towel for the handkerchief. Not long after the consultation referred to there came a sudden change. The nasal symptoms gave way to central nervous disorder. Intense congestive headaches with impaired mentality and great prostration were the chief symptoms. After six months enforced rest, much of the time in bed, she recovered completely, and is now, having changed her occupation and taken life easier, is in excellent health.

This is but one of very many similar cases seen among that great class of talented, ambitious young women, who respond too keenly to the stimulating influences of commercial life. Symptoms suggesting a transference of the area of vaso-motor disturbance to the central nervous system are not so apparent in all cases but it seems to be of not infrequent occurrence.

Persistent neurasthenia. The mucous membrane manifestations of this condition are very often subordinate in importance to the general systemic and functional depression, but occasionally cases are observed in which edema of the upper, and sometimes the lower respiratory tract with consequent disturbed respiration, and exhausting discharges and broken rest are the chief symptoms. The acute or periodical type may merge into the chronic, but often the chronic form is a vaso-motor expression of an

hereditary weakness or phase of degeneracy. The usual edema and hydrorrhea are often as severe as in a typical attack of hay fever, thus constituting a positive factor in the nervous exhaustion. The membrane is usually very pale and the tissues have a sodden appearance, thus aiding in differentiating this form from that of toxemia in which the membrane may have the appearance of irritation with hyperemia, etc.

A case of this type will illustrate some important points:

A married woman of forty-four, the mother of two children, gave the following history: Her mother, a hypochondriac at the climacteric, suicided under the mental depression following religious excitement. A brother died under similar circumstances. One of the patient's daughters is a mute from typhoid fever (?) in infancy. After her last child birth, twenty years ago, she was sick for a year or more with various manifestations of depression of nerve tone, due in part to lacerations of cervix and perineum which were remedied by operation. Uterine polypi were afterward removed, and then followed vaso-motor storms. Asthma of a peculiar type has persisted, with remissions, to the present time. Nervous excitement precipitates a severe attack at any time. Pressure over the fourth cervical vertebra, which is decidedly tender, will cause immediate dyspnea. The mere insertion of a nasal or aural speculum may cause sudden hydrorrhea with swelling of the turbinates. At times, without apparent cause the parotid and submaxillary glands will swell, lifting the tongue from the floor of the mouth until free flow is established. The joints sometimes puff up without inflammatory symptoms. [These various expressions of vaso-motor relaxation, and especially the nasal edema, suggests that the asthma is excited by bronchial edema, the spasmodic element being secondary. The repeated attacks of nasal hydrorrhea caused trophic changes, and polypi formed. Removal of these, and subsequent reduction of redundant edematous turbinates by the use of the cold snare gave temporary relief from the asthma and insomnia, but subsequent attacks have been even more severe than formerly. She is decidedly worse during the hay fever season, but a cold, frosty atmosphere will cause asthma. Her disposition is most cheerful, habits excellent and nutrition unusually good. Considering the heredity one cannot but be solicitous lest the central nervous system become the storm area and lamentable results follow. In two of the cases mentioned this feature has been observed and it is worthy of consideration in the general management of these cases.

As an evidence of the extreme discomfort and suffering of an attack of nasal hydrorrhea with more or less persistent edema, this lady states that she can endure the asthma with more fortitude than the intra-nasal congestion and stenosis, doubtless because the intra-cranial venous and lymphatic circulation are in a condition similar to that in the nares.

Surgical treatment of the obstructing turbinates should be limited to the removal, not by cauterization as a rule, of the edematous, pendulous tissue. A very decidedly beneficial effect may follow judicious operative procedure. On the contrary, in this as in operations on hay fever cases during the season of attack, the results are often injurious and bring discredit on the art. Cases should be most carefully selected and conservative nasal surgery should only supplement the classical general management adapted to the individual.

A condition which may be called *hydrorrhea gestationes* is not uncommon. It is in part from a condition bordering on nerve exhaustion and in part auto-toxic. A mild expression of similar nature is the acute hyperemia of the larynx seen during the early months of pregnancy. Persistent hydrorrhea and edematous obstruction of the nares may add to the discomfort of the last months of pregnancy. Occasionally operative procedure is justifiable, depending upon the previous condition of the tissues and the urgency of symptoms. General or special nervous depression following parturition is not favorable to restoration of the tissue to the normal condition and here again careful adjustment of local treatment with general tonic and restorative measures may be successful.

Auto-toxic conditions can effect the mucous membrane of the upper and lower respiratory tract in two ways. Through abnormal conditions of the central or sympathetic nervous system vaso-motor and trophic disturbances occur, and secondly, vicarious elimination of toxic or excretory products may cause pathologic changes in the tract of mucous membrane upon which this unnatural function is imposed.

Auto-toxemia may be divided into two general groups. Intestinal and metabolic auto-toxemia are distinctions conveying suggestions for treatment. The chemical study of the end products of toxemia, *i. e.*, the uric acid and xanthine groups, as found in the urine, is approaching scientific accuracy, but we know comparatively little of the changes in mucous membrane secretions in abnormal blood states. Certain it is that the peculiar vaso-motor disturbances under consideration are associated with well studied forms of auto-toxemia the recognition of which is essential to rational treatment.

As a general rule, subject to many exceptions, it may be

observed that the membrane irritated by the presence of some excretory product in its secretion is hyperemic. The form of edema from simple depressed nerve function is characterized by paleness and absence of any true inflammatory symptoms.

Cases exhibiting various phases of auto-toxemia will be narrated.

A married woman of thirty gave the following history which exhibits a decided tendency toward kidney disease, her father having died of Bright's disease and brothers and sisters having shown the same constitutional characteristics. The patient has had puerperal eclampsia once. The urine is quite normal at present but she has at times very decided polyuria. There are many general symptoms of some degree of auto-toxemia, but we are concerned mainly with the periodical attacks of faucial edema as a symptom of cumulative auto-toxemia. The peritonsillar tissue swells in a few hours so as to prevent deglutition. The inflammatory features are slight. This occurred twice monthly for months and has persisted with some remissions for about two years. The patient is confined to bed during the attack and eats nothing for a day or two, and then it subsides quickly, leaving the throat apparently normal. Starvation seems to be the curative measure. A careful study of the urine has not been made, but certain it is that general hygienic treatment and eliminative medication broke up the periodicity of the attacks, and she was free for many months. Turkish baths, massage, and exercise, with lithia water internally constituted the treatment, and the result tends to confirm the diagnosis.

Cases of auto-toxemia of the *lithemic type* of nasal vaso-motor disturbance are very common. The narration of one will cover most of the important points:

A maiden lady who has passed the climacteric gave the following history. She is descended from strong vigorous stock. She departed from their active, hardworking habits of life and entered a convent, afterward taking full sisterhood orders. The confinement has developed lithemia of very pronounced type. Suboxidation suggests the character of the defective tissue metabolism, and she is thoroughly poisoned. Occasional attacks of acute articular rheumatism were noted. The urine was, and is, surcharged with uric acid and compounds. She has many general symptoms but the vaso-motor disturbances mainly concern us. Of late years the rheumatism has given way to attacks of nasal edema and hydrorrhea. Gradually the bronchial tract becomes involved and she develops asthmatic breathing. The nasal stenosis is very persistent and the discharge is often very acrid and irritating. It resists all tonic and local treatment. The constitutional condition suggested eliminative medication and I directed that she take pilocarpin and follow in one-half hour with a hot sling and hot bath. This treatment would give her decided relief for several days to a week. I was not able to follow it up by systematic eliminative medication and hygienic treatment on account of her leaving town, but some months later I

received a request for the prescription which had given her such decided relief.

Both of these cases give evidence of auto-toxemia and certainly not of the intestinal type. Their habits of eating and diet were excellent. The exact nature of the toxemia cannot be determined, and the cases cannot always be differentiated, but a careful study will give indications for treatment. Diuretics sometimes give best results. Occasionally diaphoresis is indicated, and it must be emphasized that the most rigid hygienic management is essential. Suboxidation, due often to sedentariness and lack of good air, contributes to the blood already contaminated by poisons retained from a naturally defective eliminative system more poisons until the central and sympathetic nervous systems are disturbed and all secretory surfaces become channels of elimination. Persistence of those conditions lead to such trophic changes as has been mentioned and a new element is introduced into treatment.

As to auto-toxemia of the intestinal type it seems scarcely necessary to narrate illustrative cases. The common vaso-motor disturbances from this source, such as urticaria, are constantly in mind. Asthma is frequently determined by gastro-intestinal fermentation or putrefaction producing toxins and ptomaines, which being absorbed may cause irritation of nerve centers, or, in some form of intermediary metabolic change toward a terminal excretory product such as uric acid, may be eliminated by the respiratory mucous membrane thereby causing irritation, congestion or vaso-motor relaxation and edema. The general tendency toward polypoid tissue in the nares may be regarded as an expression of depressed vaso-motor function. Nasal obstruction is indeed a factor in causing or prolonging asthma, but it is certainly wrong to attribute too much importance to nasal polypi. In fact the nasal condition may be looked upon as an exaggerated indication of the condition of the bronchial membrane in asthmatic as well as in other diseases. If we consider the dyspnea as in part caused by edema of the mucous membrane then the bronchial spasm may be essentially a conservative process. Spasmodic constriction of the tube that is gradually closing by swelling of mucous membrane intensifies the threatening asphyxiation and arouses the whole respiratory function, including the vaso-motor system, by the primary stimulating effect of carbonic

acid poisoning. Thus it may serve to prevent a dangerous degree of edematous swelling. The copious sero-mucus expectoration following attacks of asthma in most cases certainly tends to corroborate the theory that there is a sudden transudation into the membrane, and that relief is co-incident with the escape of the fluid into the lumen of the bronchioles.

The infectious diseases, and especially la grippe, cause vaso-motor relaxation, and hence we often find nasal hydrorrhea and edema among the train of sequellæ. Undoubtedly many cases of serious accessory sinus disease begin in this way, the trophic changes consequent upon edema paving the way for infection and destructive disease processes.

In closing it may be observed that it will be rare to find the different types of vaso-motor disturbances sharply defined but all will merge more or less into each other. It is desirable to push differential diagnosis as far as possible in order that a basis of rational treatment may be determined.