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PROBLEM ON THE STATE OF THE
BRONCHOPULMONARY SYSTEM IN PATIENTS
WITH CHRONIC ALLERGIC RHINOSINUSOPATHY

I. I. Goldman, et al

Foreign Technology Division
Wright-Patterson Air Force Base, Ohio

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Block	Italic	Transliteration	Block	Italic	Transliteration
А а	<i>А а</i>	A, a	Р р	<i>Р р</i>	R, r
Б б	<i>Б б</i>	B, b	С с	<i>С с</i>	S, s
В в	<i>В в</i>	V, v	Т т	<i>Т т</i>	T, t
Г г	<i>Г г</i>	G, g	У у	<i>У у</i>	U, u
Д д	<i>Д д</i>	D, d	Ф ф	<i>Ф ф</i>	F, f
Е е	<i>Е е</i>	Ye, ye; E, e*	Х х	<i>Х х</i>	Kh, kh
Ж ж	<i>Ж ж</i>	Zh, zh	Ц ц	<i>Ц ц</i>	Ts, ts
З з	<i>З з</i>	Z, z	Ч ч	<i>Ч ч</i>	Ch, ch
И и	<i>И и</i>	I, i	Ш ш	<i>Ш ш</i>	Sh, sh
Й я	<i>Й я</i>	Y, y	Щ щ	<i>Щ щ</i>	Shch, shch
К к	<i>К к</i>	K, k	Ъ ъ	<i>Ъ ъ</i>	"
Л л	<i>Л л</i>	L, l	Ы ы	<i>Ы ы</i>	Y, y
М м	<i>М м</i>	M, m	Ь ь	<i>Ь ь</i>	'
Н н	<i>Н н</i>	N, n	Э э	<i>Э э</i>	E, e
О о	<i>О о</i>	O, o	Ю ю	<i>Ю ю</i>	Yu, yu
П п	<i>П п</i>	P, p	Я я	<i>Я я</i>	Ya, ya

* ye initially, after vowels, and after ъ, ь; e elsewhere.
 When written as ѣ in Russian, transliterate as ye or ë.
 The use of diacritical marks is preferred, but such marks
 may be omitted when expediency dictates.

PROBLEM ON THE STATE OF THE
BRONCHOPULMONARY SYSTEM IN
PATIENTS WITH CHRONIC
ALLERGIC RHINOSINUSOPATHY

I. I. Goldman and S. I. Ovcharenko

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Allergic rhinosinusopathy, asthmatic bronchitis and catarrhal asthma pertain to the widespread diseases of the respiratory tract. At the present time there are no sufficient bases to assume that each of these diseases is an isolated affection of a particular anatomical area of the respiratory tract. Any one of these diseases should be considered as a manifestation of a general allergic reaction of the entire respiratory tract.

Asthmatic bronchitis or catarrhal asthma develop in those cases when respiratory allergy predominates in the trachea or bronchi. More often, however, the first symptoms of respiratory allergy develop in the nasal cavity. With an unfavorable

concurrency of events, manifestations of decurrent tracheo-bronchitis can subsequently accompany the allergy of the nose and accessory sinuses, which is fraught with the development of asthma attacks (B. S. Preobrazhenskiy, 1964; A. G. Likhachev, 1965).

Enough data have been accumulated which indicate that allergy in the upper respiratory tract can be considered as a possible precursor of bronchial asthma. In the observations of Baagoe, cited by Hodek (1964), approximately one third of individuals who were not treated for the allergic conditions of the nasal cavity came down with asthma. Of course this happened over a period of time. According to the data of Hodek who studied the anamnesis of 378 persons suffering from catarrhal asthma, it was established that in 194 cases asthma developed on the background of the existing allergic rhinitis. In 62% of cases asthma developed during the first 10 years from the onset of rhinitis, in other instances - even later. In 166 patients allergic rhinitis developed simultaneously with bronchial asthma and only in 18 it developed a certain time after the first asthma attack.

Similar data are cited by N. M. Mitrokhina (1968): in 74.3% of the cases allergic rhinosinusopathy preceded catarrhal asthma, in 15.5% it developed simultaneously with asthma and only in 9.2% it appeared after the allergic affection of bronchi.

There are several other interesting works in the Soviet literature devoted to this subject. D. I. Tarasov and T. A. Tretyakova (1965), N. N. Yudov (1968) et al. have studied the pathology of the nose and accessory sinuses in patients with various manifestations of allergy of the bronchi.

Unfortunately, other otorhinolaryngologists, as well as therapists, are not sufficiently informed concerning the interaction between the upper and lower respiratory tracts. Interns having observed the various abnormalities in the nasal

cavity and its accessory sinuses (polyp, areas of hypertrophy, etc.) frequently consider them to be the result of a reflex spasm of the bronchi and recommend surgical removal as the remedy.

Actually, what we have here are the symptoms of the same disease in the development stage of irreversible changes in the allergized mucous membrane of the upper respiratory tract. However, the early manifestations of allergy in the mucous membrane of the nasal cavity and accessory sinuses often remain undetected by the rhinologist or therapist. Thus, when a doctor examines the respiratory organs without paying attention to the state of the nasal cavity and accessory sinuses, especially with regard to the allergy aspect, he can make an error in his diagnosis. In these cases the first symptoms of tracheobronchitis due to allergy, which are characterized by coughing spells, are often treated as symptoms of benign or subacute bronchitis. In this case the usual procedure is to prescribe antibiotics, expectorants, etc., losing time for a more rational treatment. Quite often the situation is revealed only after the first attack of asthma.

The manifestation of allergy in the nasal cavity is often the initial period of sensitization of the entire respiratory tract. Since it is the earliest symptom of allergy in the respiratory tract it can be an important indicator. What are the methods of early detection of allergy in the bronchi of such individuals?

We use the following procedure.

A. *A thorough analysis of the pulmonary anamnesis:* difficulty in breathing when one steps out from a building into a street in cold damp weather; coughing attacks, itching and tickling sensation in the chest. We try to find out whether the patient had attacks of extreme difficulty in breathing, in particular with sibilant rale, cough, etc., during exhalation; how frequent are the catarrhs of the upper respiratory tract, acute bronchitis and whether the patient is predisposed toward catching colds.

B. *Obligatory auscultation of lungs.* Sometimes, even with a simple auscultation of the lungs, disseminated treble sibilant rales can be heard. Most often this is encountered in a patient with allergic rhinosinusopathy, with "pulmonary anamnesis." If the pathology cannot be revealed with ordinary breathing, auscultation of the lungs is accomplished with forced exhalation. After the patient exhales completely the individual is asked to make a quick forced exhalation. In those predisposed toward bronchospasm, dry rales are heard during the forced exhalation.

C. *Spirography.* The respiration is recorded on a rapidly moving kymograph tape. In healthy individuals the exhalation is 1.2 times longer than inhalation. In individuals afflicted with respiratory allergy this relationship changes due to longer exhalation period. Further, the vital capacity of the lungs and the forced exhalation per minute (Tifno index), relative to it in volume percent, are determined. This index reflects the state of bronchial permeability. According to the data of A. O. Novokatikyan (1967) the mean norms of the Tifno index are equal to 80-85%, while according to the material of Hamm (1956) et al. - 75%. As a result of these studies we consider that the Tifno index of below 70% indicates with certainty the presence of bronchospasm.

D. *Pneumotachometry* permits us to evaluate bronchial permeability using the maximum volumetric rate of the air stream during the inhalation and exhalation (according to Votchal, the mean indices are 5-10 liters/s for men and 3-6 liters/s for women). With a change in bronchial permeability these indices decrease respectively.

E. *Provocative inhalation test with histamine* was used in those cases when all methods described above did not indicate the presence of bronchospasm. Histamine aerosols were used with its minimum concentration (0.825 mg/ml). Spirograms were recorded and Tifno index was determined. The test was terminated when the

patient began to cough (indicating bronchospasm).

Using this method we examined 57 individuals suffering from chronic allergic rhinosinusopathy (15 men and 42 women) in ages from 14 to 52. The patients were divided into groups depending on the duration and stage of the disease (Table 1).

Table 1. *Patients grouped depending on the duration and stage of rhinosinusopathy.*

Stages of disease	Number of Observations	Duration of disease (in years)					
		Under 1 yr.	1-3	4-6	7-9	10-12	Over 12 yrs.
Catarrhal	14	4	4	4	2		
Edematous	6	1	2	1	1	1	
Hyperplastic	12	—	5	4	1	2	
Polypous	25	—	7	9	3	4	2
Total	57	5	18	18	7	7	2

It is evident from Table 1 that hyperplasia of mucous membrane of the nose and its accessory sinuses, as well as its polypous degeneration, develops at the later stages of development of allergy in the upper respiratory tract, at the time when reversible changes of mucous membrane are encountered more frequently during the first years of the disease. The most serious form of extensive polyposis is encountered more frequently in individuals suffering from allergic rhinosinusopathy for over 4-5 years.

What is the correlation between the seriousness of allergic changes revealed in nasal cavity and the state of the bronchopulmonary system?

With the usual auscultation 27 of the 57 individuals examined had dry rales, which is a direct indication of a change in the bronchopulmonary system. With the control spiograph the Tifno

index turned out to be lower than 70% in all 27 individuals of this group (from 25 to 53%). Eight of them had attacks of asthma and the rest had particular clinical symptoms of bronchial affection (cough with sputum, etc.). This has enabled us to diagnose catarrhal asthma or asthmatic bronchitis in these individuals.

The other 30 individuals suffering from allergic rhinosinusopathy, in which dry rales were not heard with the usual auscultation of the lungs, comprised the 2nd group and all of them had undergone a thorough instrumental study, using the method indicated above. Dry rales in the lungs were heard in 6 of them during forceful exhalation. Using spirometry, definite symptoms of bronchospasm were revealed in most of the other patients. Provocation with histamine was required to demonstrate bronchospasm in individual cases.

Thus, with the aid of clinical and laboratory studies carried out on 57 individuals suffering from allergic rhinosinusopathy, a whole series of pathological changes in the bronchopulmonary system were revealed in most of the patients, which are presented in Table 2.

It is evident from Table 2 that of the individuals suffering from allergic rhinosinusopathy only 2 had healthy lungs. Latent bronchospasm was revealed in 28 individuals without any clinical manifestations of allergy in the bronchi. Among the remaining 19 patients with established symptoms of asthmatic bronchitis the later were clinically demonstrable in 9 patients. Eight were diagnosed to have catarrhal asthma.

In a majority of cases catarrhal asthma was diagnosed in individuals with a prolonged allergological anamnesis, suffering from irreversible changes in mucous membrane of the nose and its accessory sinuses (locular and parietal hyperplasia, polyposis).

Table 2. *Changes in bronchopulmonary system of individuals suffering from allergic rhinosinusopathy.*

Results of lung analysis	Number of observations	Bronchial asthma revealed in the anamnesis
No changes observed in lungs	2	—
Latent bronchospasm observed	28	4
Allergic bronchitis with minimal clinically manifestations	10	2
Allergic bronchitis with clinically pronounced symptoms	9	3
Symptoms of catarrhal asthma revealed	8	8
Total	57	17

It is characteristic that in one half of these individuals the polyposis of the nose and accessory sinuses has a serious disseminated nature. Individuals who had no changes in the lungs, early stages of development of the rhinosinusopathy were observed. The duration of their disease did not exceed 3-4 years. However, in the majority of cases symptoms of allergic bronchitis developed during the first ten years after the onset of allergic rhinitis.

In this work we attempted to draw the attention of the otorhinolaryngologists and therapists to those suffering from chronic allergic rhinosinusopathy, who should be considered as potential asthmatics.

This position is established by the results of a functional study of the lungs, as a result of which, latent and manifested symptoms of disorder in bronchial permeability were revealed in most of the 57 individuals.

The proposed method for a follow-up study of the bronchopulmonary system in those with respiratory allergy enables

a physician to detect early stages of damage to the bronchi and also observe the dynamics of these changes.

Dispensary-type observation and, when necessary, active anti-allergy treatment facilitate the prophylaxis of the most serious manifestations of bronchial allergy.

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THE STATE OF THE LOWER RESPIRATORY TRACT IN PATIENTS WITH CHRONIC ALLERGIC RHINOSINUSOPATHY

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Summary

By means of meticulous evaluation of the pulmonary anamnesis, auscultation of the lungs, spirometry, pneumotachometry and histamine aerosol provocations the authors examined the lower respiratory tract in 57 patients with chronic allergic rhinosinusopathy. According to the accepted classification a catarrhal stage of rhinosinusopathy was noted in 14, edematous — in 6 hyperplastic — in 12 and polypous — in 25 patients. Latent bronchospasm was revealed in 28 patients, of this number allergic bronchitis with minimal clinical manifestations in 10, with clinically marked symptoms in 9; bronchial asthma was established in 8 patients. The lungs proved to be healthy only in 2 patients with a short-term allergological anamnesis. In the overwhelming majority of cases bronchial asthma was found in persons with a protracted allergological anamnesis suffering from persistent, often irreversible, changes of the mucous membrane of the nose and accessory sinuses (hyperplasia, polyposis). In most cases symptoms of allergic bronchitis occurred within the first ten years from the onset of allergic rhinitis. Attention is drawn to the fact that allergic rhinosinusopathy may be of importance as a possible precursor of allergic bronchitis and bronchial asthma.