

From Serviço de Alergia do Departamento de Clínica Médica do Hospital das Clínicas, Faculdade de Medicina da Universidade de São Paulo, Brasil.

IMMUNOLOGICAL STUDIES ON BRONCHIAL SECRETION

II. Antibodies Against Bronchial Secretion in Systemic Lupus Erythematosus and Asthmatic Patients

By

ERNESTO MENDES

Several contributions have suggested that bronchial secretion is reabsorbed; and immunological studies have shown antigenic determinants from bronchial secretion in circulation.

Human bronchial secretion is antigenic for guinea-pigs, producing anaphylaxis and experimental asthma (5). Bronchial secretion has antigens in common with lung, liver, kidney, erythrocytes, serum, intestinal mucus and saliva; and it also has its own antigens (6). When an antiserum to sputum is absorbed with human plasma, the residual antibody activity may be considered to be directed against specific components of bronchial secretion (4). If the bronchial secretion possesses its own antigens, which are absorbed, it would be expected that immune responses to them might occur. The present work is an attempt to detect antibodies against bronchial secretion in a group of patients and normal individuals.

MATERIALS AND METHODS

Human Sera

Sera from 100 asthmatic patients, 29 patients with other diseases, 72 patients with systemic lupus erythematosus (S.L.E.) and 31 normal individuals were studied.

Bronchial Secretion

Bronchial secretion, obtained and prepared according to a technique previously described (6), was used at the concentrations of 1 g/100 ml and 0.5 g/100 ml in saline.

Double Gel-diffusion

A standard method was used, as described elsewhere (5).

Bronchial secretion at the concentration of 0.5 g/100 ml was used as antigen. Sera from 100 asthmatic patients, 29 patients with other diseases, 31 normal individuals and 72 patients with S.L.E. were tested.

Passive Haemagglutination

The method of haemagglutination and inhibition of haemagglutination as described by Stavitzky (9) was employed.

Human erythrocytes 0 Rh - and bronchial secretion from patients with blood group 0 were used.

Bronchial secretion at the concentration of 1 g/100 ml was used as antigen.

One hundred sera from asthmatic patients, 29 sera from patients with other diseases and 31 normal sera were tested.

RESULTS

Double Diffusion Tests

1. *Sera from patients with S.L.E.:* There were two positive reactions with one precipitation band. Sera from one patient obtained at 3 different periods of time showed a positive reaction only in one serum sample.

2. *Sera from patients with asthma, other diseases and normal individuals:* All reactions with sera from asthmatic patients, with sera from other diseases and sera from normal individuals were negative.

Passive Haemagglutination Tests

1. *Sera from asthmatic patients:* There were six positive reactions, but only three presented inhibition with bronchial secretion. The three patients had chronic asthma, occurring in different circumstances in response to several stimuli.

The titers varied from 1/10 to 1/640 (Table I).

2. *Patients with other diseases:* There was a positive reac-

TABLE 1

Detection of Antibodies in Asthmatic Patients against Bronchial Secretion by Passive Haemagglutination and Inhibition of Passive Haemagglutination.

Titers	Asthmatic patients						Non-allergic patient
	1	2	3	4	5	6	
1/10	-	-	+++	+++	+++	+++	+
1/20	-	-	+++	+++	++	+++	+
1/40	-	-	++	++	+	+	+
1/80	++	++	+	+	+	++	+
1/160	++	+	+	-	+	+	+
1/320	-	+	+	-	-	+	-
1/640	-	+	-	-	-	-	-
1/1,280	-	-	-	-	-	-	-
1/2,560	-	-	-	-	-	-	-
Inhibition with bronchial secretion	1/50 and 1/100	1/50, 1/100 and 1/1,000	1/50 and 1/100	no inhibition			

tion (titers 1/10, 1/40) without inhibition against bronchial secretion; so the reaction was considered non-specific.

3. *Sera from normal individuals:* All reactions were negative.

DISCUSSION

A small percentage of sera from S.L.E. patients showed positive reactions against bronchial secretion, revealed by the double gel-diffusion method. It is known that antibodies against cell components are usually found in S.L.E. patients. On the other hand, the antigenic relationship between bronchial secretion and several organs or cells (mainly erythrocytes) was demonstrated by Bukantz & Berns (2) and Mendes et al. (6). Antibodies against sputum observed in two S.L.E. patients can probably be explained by antigens common to sputum and organs or cells.

A few sera from asthmatic patients showed positive haem-

agglutination reactions, using sputum as antigen. In this case, two alternatives can be suggested: presence in the serum of antibodies against cell antigens cross-reacting with sputum; or presence of antibodies formed directly against the reabsorbed bronchial secretion.

Human bronchial sputum produce experimental asthma in guinea-pigs and anti-sputum precipitins were demonstrated in the sera of these animals (5). It would be of interest to consider the possibility of the formation of antibodies against reabsorbed sputum antigens; and to bring up the question, highly speculative, of the possibility of bronchial secretion, segregated in the alveolar parenchyma, acting as an auto-antigen, under certain conditions. According to Nettesheim & Williams (7), particulate antigens deposited in the alveolar parenchyma are eliminated, and a small proportion enter the blood stream and trigger an immune response. It is worth mentioning that, in intrinsic asthma, non-organ-specific auto-antibodies have been described against smooth muscle and other auto-antigens (3, 9, 10). It is not known whether these antibodies have a pathogenetic role, nor which immunological mechanisms would be involved. Nevertheless, further contributions are necessary in order to study the absorption and immunogenicity of bronchial secretion.

SUMMARY

Bronchial secretion was tested by double gel-diffusion with sera from 100 asthmatic patients, 72 systemic lupus erythematosus patients, 29 patients with other diseases and 31 normal individuals. Positive gel-diffusion reactions were observed only in the sera from two patients with S.L.E.

Sera from 100 asthmatic patients, 29 non-allergic patients and 31 normal individuals, tested with bronchial secretion by the passive haemagglutination and inhibition test, showed only three positive reactions with sera from asthmatic patients.

Two problems were discussed: the immunological relationship between antigenic determinants found in the sputum and

serum in S.L.E. patients; and the possibility that the bronchial secretion being reabsorbed might act as an auto-antigen.

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Author's address:

Ernesto Mendes, M.D.
 Seção de Alergia do
 Hospital das Clínicas
 Caixa postal 8091
 01000 - São Paulo
 Brazil

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