Efficacy of preoperative immunoprophylaxis in patients with neoplastic diseases

II. Estimation of antihaemagglutinin and antineuraminidase antibody titre or influenza viruses A and B

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SUMMARY

Efficacy of preoperative immunoprophylaxis in patients with neoplastic diseases

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The evaluation of the immunological system in a patient is an essential element in monitoring a neoplastic disease. A neoplastic change causes many disorders in specific and non-specific immunity. In standard conditions infectious complications in the respiratory system often occur in postoperative patients so antihomotoxic drugs Gripp-Heel and Engystol'N have been used.

Key words: Immunology; humoral phenomena; antihomotoxic drugs

STRESZCZENIE

Skuteczność okołooperacyjnej immunoprofilaktyki pacjentów z chorobą nowotworową

II. Określenie miana przeciwciał przeciwko hemaglutyninie i przeciwko neuraminidazie wirusów grupy A i B

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Zbadanie układu immunologicznego pacjentów jest głównym elementem monitorowania choroby nowotworowej. Zmiany nowotworowe mogą spowodować wiele uszkodzeń odporności swoistej i nieswoistej. W przebiegu pooperacyjnym u tych chorych mogą się pojawiać powikłania ze strony układu oddechowego. Preparaty antyhomoloksyczne Gripp-Heel i Engystol'N stymulują odpowiedź humoralną w teście hamowania aktywności neuraminidazy wirusów grypy.

Słowa kluczowe: immunologia; odpowiedź humoralna; leki antyhomotoksyczne

The use of immunomodulatory drugs is an essential element in therapy and infection prevention in patients with a neoplastic disease. They are patients at high risk of infections, due to the neoplasm and also to agressive antineoplastic chemotherapy. Immunostimulators have been used mainly to prevent infectious postoperative complications in the respiratory system.

The aim of the study was to evaluate the immunostimulating properties of Gripp-Heel and Engystol'N preparations in neoplastic patients operated on. Immunostimulating properties of the components of the preparations are known and accepted (3, 4, 5, 9, 10).

MATERIAL AND METHODS

The experiment was carried out on 61 patients at the age from 30 to 77 years, as in Part I of the study where phagocytic activity and bactericidal properties of granulocytes in peripheral blood were analysed.

The procedure included:

1. The estimation of values and dynamics of changes of selected parameters in the 1st and 3rd week of hospitalization in patients with a breast or abdominal cavity neoplasm.
2. The comparison of investigated parameters between groups and with the control group.

RESULTS

Humoral immunity was evaluated using two serological reactions defining the increase of antibodies against haemagglutin in and neuraminidase of influenza viruses A(H1N1), A(H3N2) and B(1, 2, 8).

Statistical analysis was carried out for 3 groups to compare the data without or after immunostimulation (Table 2). In groups after immunostimulation apperently higher titres were obtained in experiment B after about 10 days of hospitalization compared with initial data.

No differences were observed between the investigated groups of patients with breast carcinoma and those operated on because of abdominal cavity carcinoma. In the experimental group after stimulation with antihomotoxic preparations the changes were similar, without statistical significance.

The results of the statistical analysis for neuraminidase antibody titre of influenza viruses are presented in Table 3. It seems that hospitalization has a stimulating effect on the titre increase, and explanation may concern the subclinical infections by viruses causing changes in the respiratory system.

These differences of highly significance after administration of immunostimulators give a result of changes of values for neuraminidase influenza viruses A1 from 7.62 +/- 7.0 to 18.57 +/- 12.36, for influenza virus A2 from 8.57 +/- 5.73 to 20.48 +/- 10.71, and for virus B from 10.0 +/- 9.49 to 31.90 +/- 19.85.

The graphic pictures of OZHA for the investigated influenza viruses are presented in Figures 1 and 2, for OZNA in Figures 3 and 4.

DISCUSSION

Immune response, i.e. recognition of the pathogen or a foreign body and reaction against them to eliminate them. There are two types of immune responses: congenital (non- specific) and acquired (specific). The acquired response is highly specific for the given pathogen which is a significant difference between them.

Congential response does not change after repeated exposure to a given infection factor, whereas acquired response intensifies with every successive contact with the pathogene; so finally acquired immunity "remembers" the infection agent and prevents the disease (12).

These suggestions are also relevant to infections with influenza viruses. The first contact with influenza antigen leaves the information about the virus, components.

Table 1. Reaction of haemagglutination inhibition of influenza viruses A and B

Group		OZHA					
		H1N1		H3N2		B	
		a	b	a	b	a	b
Control group (without immunostimulation)	Together	0.00 0.00 11	2.73 4.67 11	10.00 7.75 11	13.64 8.09 11	10.00 7.75 11	14.55 15.08 11
	Breast carcinoma	0.00 0.00 5	4.00 5.48 5	8.00 8.37 5	14.00 8.94 5	10.00 10.00 5	18.00 18.00 5
	Carcinoma in abdominal cavity	0.00 0.00 5	4.00 5.48 5	8.00 8.37 5	14.00 8.94 5	10.00 10.00 5	18.00 18.00 5
Investigated group	Together	0.48 2.18 21	0.95 4.36 21	5.71 7.46 21	9.52 10.24 21	10.48 10.24 21	16.19 16.58 21
	Breast carcinoma	0.00 0.00 11	0.00 0.00 11	6.36 8.09 11	10.91 12.21 11	8.18 8.74 11	10.91 8.31 11
	Carcinoma in abdominal cavity	1.00 3.16 10	2.00 6.32 10	5.00 7.07 10	8.00 7.89 10	13.00 11.60 10	22.00 21.50 10

a – investigation I; b – investigation II

Table 2 . Reaction of neuraminidase inhibition of influenza viruses A and B

Group		OZHA					
		H1N1		H3N2		B	
		a	b	a	b	a	b
Control group (without immunostimulation)	**Total**	7.27 7.86 11	20.00* 16.73 11	8.18 6.03 11	22.73* 14.21 11	11.82 11.68 11	28.18** 12.50 11
	Breast carcinoma	6.00 5.48 5	20.00 18.71 5	6.00 5.48 5	18.00 13.04 5	4.00 5.48 5	22.00* 13.04 5
	Carcinoma in abdominal cavity	8.33 9.83 6	20.00 16.73 6	10.00 6.32 6	26.67* 15.06 6	18.33 11.69 6	33.33* 10.33 6
Investigated group	**Total**	7.62 7.00 21	18.57** 12.36 21	8.57 5.73 21	20.48*** 10.71 21	10.00 9.49 21	31.33*** 19.65 21
	Breast carcinoma	6.36 5.05 11	15.45** 10.36 11	8.18 7.51 11	20.91* 13.00 11	6.36 8.09 11	29.09** 20.23 11
	Carcinoma in abdominal cavity	9.00 8.76 10	22.00 13.98 10	9.00 3.16 10	20.00** 8.16 10	14.00 9.66 10	35.00** 19.58 10

a – investigation I
b – investigation II
M – mean value
SD – standard deviation
n – number of investigated patients
*p<0.05 (related to investigation I)

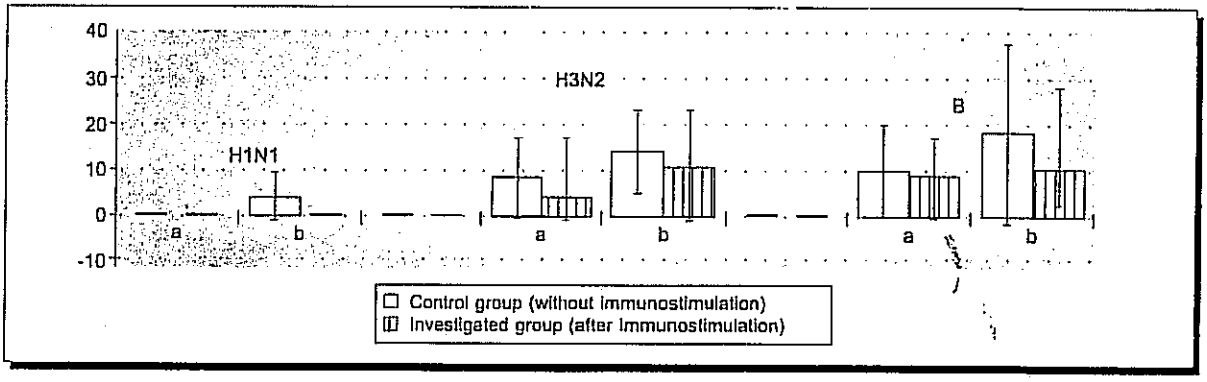

Fig. 1. Reaction of haemagglutination inhibition of influenza viruses A and B in patients with breast carcinoma.

*p<0.005 (related to groups without and after immunostimulation); a – investigation I; b – investigation II

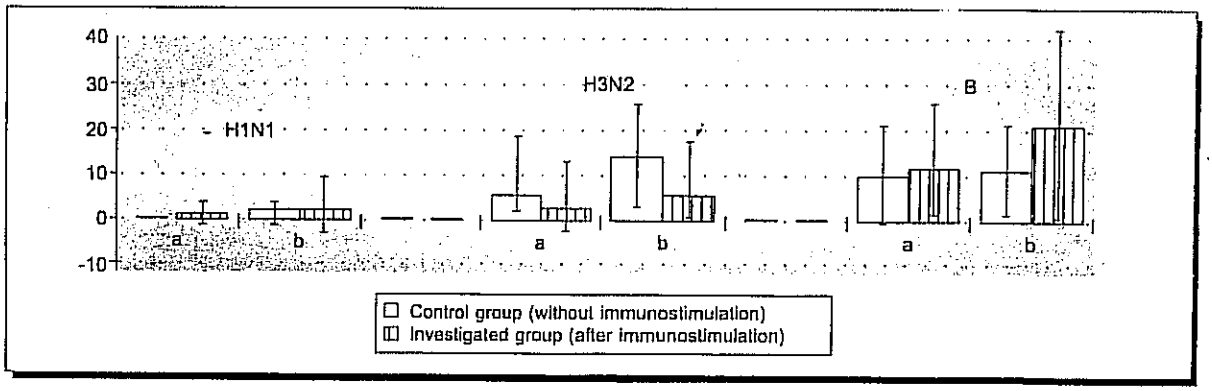

Fig. 2. Reaction of haemagglutination inhibition of influenza viruses A and B in patients with abdominal cavity organs carcinoma.

*p<0.05; **p<0.01; ***p<0.001 (related to groups without and after immunostimulation); a – investigation I; b – investigation II

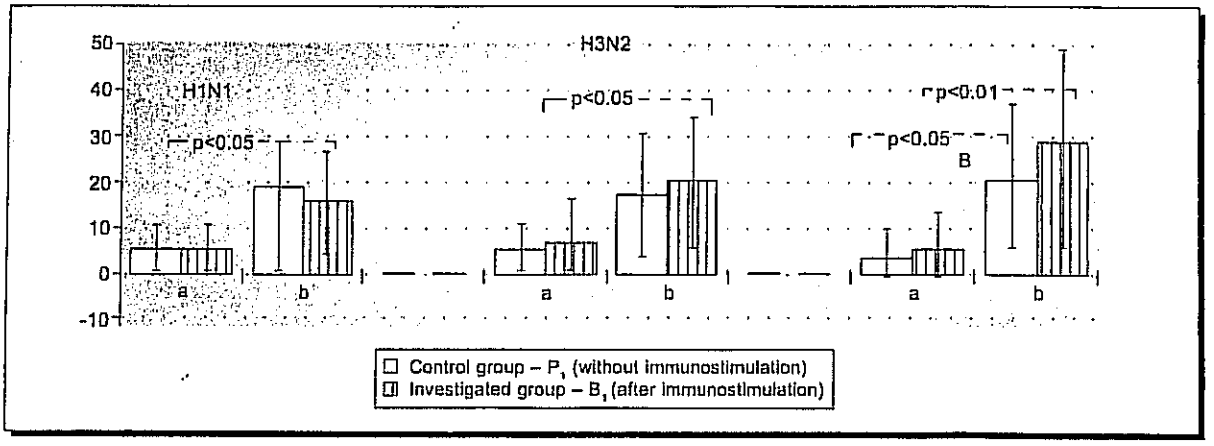

Fig. 3. Reaction of neuraminidase inhibition of influenza viruses A and B in patients with breast carcinoma.

*p<0.05; **p<0.01; ***p<0.001 (related to groups without and after immunostimulation); a – investigation I; b – investigation II

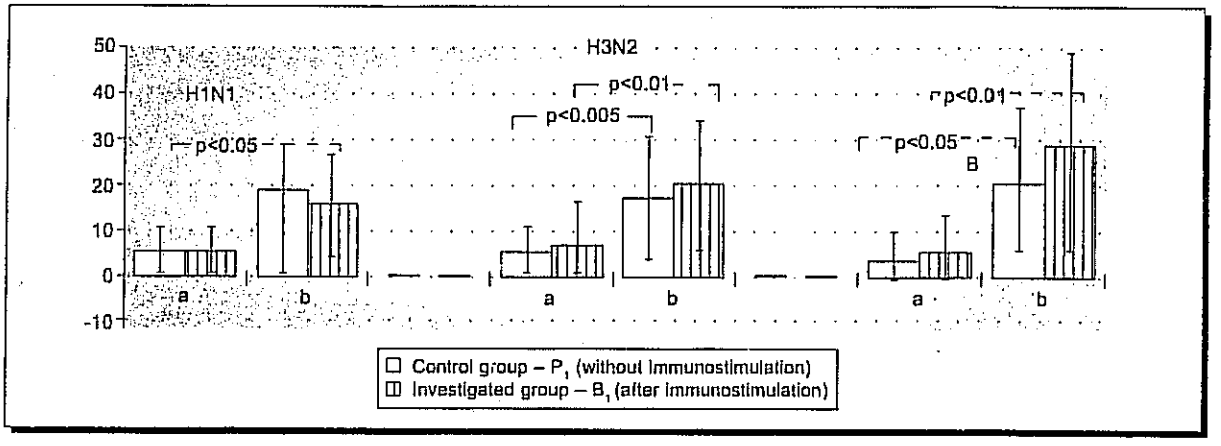

Fig. 4. Reaction of neuraminidase inhibition of influenza viruses A and B in patients with abdominal cavity organs carcinoma.

*p<0.05; **p<0.01; ***p<0.001 (related to groups without and after immunostimulation); a – investigation I; b – investigation II

Antigens which are included in phagocyted particles, after metamorphosis are presented as HLA class II antigenes. HLA class II antigenes are the main component on the so called cells with antigenic properties (lymphocytes macrophages, dendric cells) but they can also occur on other cells under the influence of cytokins (e.g. INF-γ). Generation of effector lymphocyte clones the exposure of which to antigens leads to the proliferation and formation of INF-γ (Th1 lymphocytes) or II- 4 (Th20 is caused by CD.4 lymphocyte stimulation (11).

Acquired immunity is produced as a result of an agent harmful to or a factor strange to the organism and develops during the whole life (7).

Lymphocytels B can recognize antigen using antibodies combined with the cell membrane functioning as a receptor. Lymphocytes T have a specific receptor (TCR) and need additional structures – antigen tissue compatibility ((HLA system) – to recognise the antigen. Viruses antigens are recognized by CD.8 phenotype lymphocytes as class I HLA antigens. These lynphocytes (cytotoxic lymphocytes) destroy cells which virus antigens are on and prevent further virus replication (6).

Stimulation of antiinfluenzal humoral response by antihomotoxic preparations may be explained as stimulation of response due to latent infections in hospital or as the effect of non-specific Gripp-Heel preparation.

CONCLUSIONS

Preoperative prevention with anthomotoxic preparations simulates antiinfluenzal humoral response observed in the test of neuraminidase activity inhibition.

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