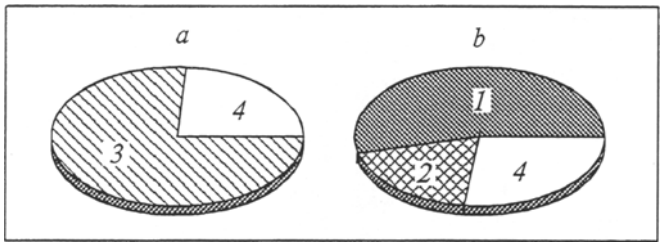

Fig. 2. Components of two-factor models of age variability: *a*) individual features of autoantigens; *b*) protein and nonprotein autoantigens. Factors: *1*) age; *2*) autoantigen nature; *3*) cooperative effect of age and autoantigen nature; *4*) nonidentified.

The contribution of age variability was 2.8-fold higher ($p<0.01$) than its alternative (Fig. 2, *b*).

Thus, the study confirmed the previously known fact of a peculiar ontogenesis of AA levels in female (NZB×NZW)F1 mice. It should be taken into account that the model antigens used in the study encompass the main types of antigen substances of the human organism. Therefore, it may be assumed that the features of variability of the levels of the test AA described in the study establish a pattern, and that the pubertal period in female (NZB× ×NZW)F1 mice is critical for the levels of all detected AA. The latter is significant for a practical study of autoimmunity in the given animals, as it restricts the investigation to narrow age limits. In view of the pattern described it is difficult to assume any difference in the fundamental development of immunoreactivity to structurally different antigens of the organism proper. Nevertheless, the nature of the autoantigen proved to be a rather powerful factor which can significantly affect the degree of variability of the studied immunological parameters, particularly in pubertal animals. That's why it is good practice to take into account the autoantigen molecular structure when designing experimental studies of the autoimmunity phenomenon.

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Effect of Thymosin Fractions on the Development of Toxic Swelling Edema of the Brain

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Rat experiments have shown that thymosin fractions V and VI elicit an antiedemic effect by normalizing predominantly the density of brain tissues, the effect being independent of the preparation dose. It is demonstrated that a high dose of fraction VII has a pronounced antiedemic effect.

Key Words: *brain edema; thymosin fractions*

The problem of swelling edema of the brain (SEB) still awaits its solution [5,9,11]. The immune system may be implicated in this process [4,11]. At the present time it is recognized that the central nervous and immune systems communicate with each other, and various peptide hormones, for example those derived from the thy-

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TABLE 1. Effect of Thymosin Fractions on the Development of Toxic (Nicotine) Swelling Edema of the Brain ($M \pm m$)

Group of animals (n=10)	Total water content, %	Brain tissue density, g/cm^3
Intact	78.331±0.138	1.0424±0.0002
Toxic (nicotine) SEB (control)	79.724±0.216	1.0378±0.0003
Preparations against nicotine background:		
Thymosin (fract. V)		
0.3 mg/kg	80.060±0.251	1.0406±0.0002*
0.6 mg/kg	79.832±0.143	1.0419±0.0002*
1.2 mg/kg	78.579±0.288	1.0413±0.0002*
Thymosin (fract. VI)		
0.3 mg/kg	79.058±0.369	1.0406±0.0001*
0.6 mg/kg	79.499±0.194	1.0419±0.0003*
1.2 mg/kg	78.879±0.168	1.0414±0.0001*
Thymosin (fract. VII)		
0.3 mg/kg	79.446±0.200	1.0391±0.0003
0.6 mg/kg	80.029±0.345	1.0382±0.0002
1.2 mg/kg	79.673±0.319	1.0390±0.0001
2.4 mg/kg	79.412±0.116	1.0392±0.0001
4.8 mg/kg	78.545±0.112*	1.0419±0.0003*

Note. Asterisk indicates values statistically significant differences from the control at $p<0.001$ (Student's t test).

mus, serve as signal transducers [1,2,7,8]. It can be assumed that the thymic hormones, including various thymosin fractions, have both immunotropic and neurotropic activity [3,6] and can modulate the development of SEB.

MATERIALS AND METHODS

Experiments were performed on 120 male outbred albino rats weighing 170-220 g. The induction and criteria of toxic SEB development are described elsewhere [10]. Thymosin fractions V, VI, and VII (Scientific Production Center Hydrobios, Ministry of Public Health) were injected intraperitoneally 1 h before decapitation.

RESULTS

At a dose of 0.3-1.2 mg/kg thymosin fraction V (T5) did not change the total water content; however, there was a tendency toward its decrease at higher doses of T5 (Table 1). At the same time, T5 increased the brain tissue density, the increase being statistically significant ($p<0.001$) and independent of the preparation dose (Table 1). Thus, T5 possesses an antiedemic activity.

Fraction T6 exhibited similar properties in SEB (Table 1). Fraction T7 had a pronounced antiedemic effect only in a high dose: 4.8 mg/kg, at which both indexes normalized.

The antiedemic effect elicited by different thymosin fractions indicates that thymic peptides are involved in the pathogenesis of SEB. Several mechanisms may be responsible for the antiedemic effect of thymosin, notably the ability to lower the level of biogenic amines in the body, to interact with the endogenous opioid system, to stimulate release of corticosteroids, etc. [3,6,12-14].

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