

PRESSOR PROPERTIES OF THE BLOOD DURING TREATMENT OF ESSENTIAL HYPERTENSION BY DIET AND SLEEP

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Humoral factors play an important part in the pathogenesis of essential hypertension. Their place in the mechanisms of maintenance of the blood pressure at a high level for long periods of time has been proved beyond doubt [1-4, 6-9].

The object of this investigation was to establish the presence of pressor substances in the blood of patients with essential hypertension and to study their changes under the influence of treatment by dietary measures and sleep.

EXPERIMENTAL METHOD

The Leven-Trendelenburg method was used for the investigation. Periodic observations (before and after treatment) were made on 56 patients with essential hypertension, including 4 with stage I, 17 with stage II, and 35 with stage III of the disease. The pressor properties of the blood were studied in 20 patients on an antihypertensive diet (low calorific value, zig-zag form, restricted chlorides and protein, high potassium-low sodium content, with addition of vitamins C and A), in 20 patients receiving sedative therapy (barbiturates, bromide, chloral hydrate), in 8 patients receiving combined dietary and sedative treatment, and in 8 patients receiving symptomatic treatment only.

Changes in Pressor Properties of the Blood of Patients with Essential Hypertension
Treated by Various Methods

Method of treatment	Index of difference				
	Before treatment		After treatment		
	M ± m	±σ	M ± m	±σ	K*
Diet	1.67 ± 0.03	0.38	1.32 ± 0.05	0.22	5
Sedation	1.92 ± 0.4	0.79	1.21 ± 0.05	0.24	0.38
Diet and sedation . .	1.4 ± 0.1	0.18	1.2 ± 0.57	0.08	1
Symptomatic treatment	1.8 ± 0.09	0.91	1.2 ± 0.01	0.96	2

* Coefficient of consistency (difference significant if K = 2.5)

$$K = \frac{M - M_1}{\sqrt{m^2 + m_1}}$$

EXPERIMENTAL RESULTS

After treatment by the antihypertensive diet, a diminution of the pressor properties was observed in the blood serum of all except 2 patients. The mean index of the difference between the number of drops of fluid flowing through the isolated vessels of a frog per minute (Ringer's solution and serum in a dilution of 1:100) was 1.67 before dietary treatment, falling to 1.32 after treatment (with different variations in individual cases). No differences in the char-

acter of the changes in the pressor properties of the blood were observed in patients with stage II and stage III of essential hypertension. In some patients the blood pressure fell after treatment, but the pressor properties of their blood did not diminish.

Following sedative therapy the changes in the pressor properties of the blood were similar in character. In all except 3 patients a diminution of the pressor activity of the blood was observed, in the form of a decrease in the index of difference after sedative therapy. The mean value of the index of difference before treatment was 1.92, and after sedative therapy 1.21.

In 4 of the 8 patients with essential hypertension receiving combined treatment with diet and sedatives, the pressor properties of the blood were unchanged after treatment despite the fall in blood pressure and subjective improvement in the patient's condition. Observations on this group of patients showed that in advanced stages of hypertension (stage III), when the renal factor has become permanently involved in the disease, these methods of treatment have a negligible effect on the pressor properties of the blood. On the average the index of difference between the volumes of serum in the same dilution (1:100) flowing through the isolated vessels of the frog was 1.8 in this group of patients before treatment and 1.2 after treatment.

Following symptomatic treatment the pressor properties of the blood usually diminished. The mean index of difference of the serum of these patients in a dilution of 1:100, flowing through the isolated vessels of the frog, was 1.8 before treatment and fell to 1.2 thereafter.

Statistical analysis of the results (see the table) showed that those obtained during the study of the spastic properties of the blood of patients treated by diet and sedatives (separatively) were significant, whereas those obtained in patients treated by other methods (combined and symptomatic) were not significant, although the simple comparison of the arithmetical mean values, especially in relation to patients receiving symptomatic treatment, clearly indicates a fall in the pressor properties of the blood after treatment.

SUMMARY

Leven-Trendelenberg's method was used to study the properties of the blood serum (in a 1:100 dilution) in 56 patients suffering from hypertensive disease at its different stages and forms; changes in these properties under the affect of treatment by a special diet, prolonged medicinal sleep, combined therapy (diet and sleep) and symptomatic therapy were investigated.

A reduction of the pressor properties in the blood serum was observed in almost all the patients under the effect of the aforementioned methods. There was no characteristic peculiarity in the changes of the pressor properties under the effect of the methods of treatment studied in any groups of patients. Only in the 111, "B" stage when a stable renal factor was included, the methods of treatment used for the reduction of the pressor blood properties proved to produce but an insignificant effect.

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