# CLINICAL, ELECTROENCEPHALOGRAPHIC AND RHEOENCEPHALOGRAPHIC CORRELATIONS IN RELATIVES OF STROKE PATIENTS

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Heredity has a determining importance for the appearance of the vascular diseases of the nervous system. It is established that cerebral atherosclerosis and its neurological complications occur two-three times more frequently in relatives of stroke patients (2, 3, 5). Besides, changes of BEA and brain hemodynamics are observed in members of families with stroke patients (2, 6, 7). Pathological abnormalities of lipid metabolism (8) followed by viscosity and hemocoagulation disturbances play an important role in this complex of investigation purposes (10, 11).

The aim of the present work was to carry out clinico-laboratory studies with relatives of stroke patients and to look for correlations between the subjective complaints, bioelectrical and hemodynamic cerebral changes and elevated biochemical parameters.

## Material and methods

A total of 40 relatives of stroke patients, of different age and sex were clinically and by EEG and REG studied. Their lipid profile was specified, too. The results obtained were compared with those from 30 healthy control individuals without any hereditary predisposition concerning vascular diseases of the nervous system.

## Results and discussion

In all the patients studied subjective complaints could be revealed. Their analysis showed the greatest relative part of headache (in 32 cases) followed by that of vertigo (24 ones), buzzing (10 ones), easy fatigueness (18 ones), memory disorders (16 ones). Both characteristic and intensity of complaints varied in relation with the age distribution. Variations were noted by + up to +++ according to intensity (table 1). In the opinion of some authors (3—5) these symptoms were associated with initial subjective manifestations of an insufficiency of the cerebral circulation. We established an increased systolic blood pressure (150—160 mm Hg) in 16 patients which was combined with a diastolic pressure increase (100—110 mm Hg) in 28 ones. Other investigators (2, 10) consider similar data a risk factor for the development of an acute insufficiency of the cerebral circulation.

We also studied the lipid metabolism, namely cholesterol (after Liebermann-Burhard; normal value 4.62—6.46 mol/l); beta-lipoproteins (after Burstein; normal value 0—45 U), and total fats (phosphovanilic solution; normal value 4—8 g/l). Then we compared the data obtained with those from the control persons (table 2).

Table 1

**Age distribution of the clinical manifestations**

| Age groups | Number | Headache | | | | Vertigo | | | | Buzzing | | Memory decreasing | | Work capacity decreasing | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | — | + | ++ | +++ | — | + | ++ | +++ | — | + | — | + | — | + |
| 20—30 | 10 | 1 | — | — | 9 | 3 | 1 | 1 | 5 | 5 | — | 3 | 7 | 3 | 7 |
| 31—40 | 18 | 2 | — | 6 | 10 | 2 | 1 | 6 | 9 | 7 | 11 | 6 | 12 | 5 | 14 |
| 41—50 | 12 | — | — | 2 | 10 | 3 | 1 | 6 | 2 | 3 | 9 | 3 | 9 | 3 | 8 |

Table 2

**Biochemical investigations**

| Age groups | Number | Blood sugar | | Total fats | | Cholesterol | | β-lipoproteins | |
|---|---|---|---|---|---|---|---|---|---|
| | | norm. | pathol. | norm. | pathol. | norm. | pathol. | norm. | pathol. |
| 20—30 | 10 | 5 | 5 | 5 | 5 | 4 | 6 | 3 | 7 |
| 31—40 | 18 | 8 | 10 | 9 | 9 | 9 | 9 | 7 | 11 |
| 41—50 | 12 | 9 | 3 | 6 | 6 | 3 | 9 | 2 | 10 |

It was obvious that in patients' relatives there was a predisposition towards hypercholecterolemia, hyperbetalipoproteinemia and an increase of the total fats that was statistically significant ($p<0.001$) thus confirming the point of view about their importance at young age in relation to the development of early atherosclerotic vascular lesions (1, 3, 8).

Dynamic EEG follow-up demonstrated a background recording of desynchronized BEA with not lavishly dispersed teta-waves and decreased reactivity during functional tests. These results were obtained with patients having considerable subjective complaints, blood pressure changes and abnormalities of bio-

Table 3

**REG and EEG indexes in patients' relatives and healthy persons**

| Persons examined | REG and EEG indexes | | | | | |
|---|---|---|---|---|---|---|
| | FMA (Ω) | FM α (sec) | FM $\frac{\alpha}{\alpha+\beta}$ (%) | FMDI (%) | FMHC (ml/min) | EEG FI |
| Patients' relatives | 0.108 ±0.011 | 0.102 ±0.013 | 15.4 ±0.11 | 38.8 ±1.1 | 235.2 ±1.1 | 9.8 ±0.11 |
| Healthy persons | 0.098 ±0.012 | 0.097 ±0.011 | 11.05 ±0.13 | 25.5 ±0.1 | 335 ±2.1 | 8.6 ±0.12 |

Legend:
$p<0.001$
FMA — frontomastoid amplitude
FMDI — frontomastoid dicrotic index
FMHC — frontomastoid hemispheric circulation
FI — frequency index

chemical indexes. They, therefore, testified to dysfunction of mesodiencephalic brain structures (9), an important pathogenetic factor for development of hypertension and cerebral vascular complications.

The rheoencephalographic examination of patients' relatives and of control individuals showed the following hemodynamic disorders (see table 3). When we compared REG-indices of patients' relatives with those of healthy controls we ascertained signs of a decreased blood supply index in the pool of the internal carotid artery or of the vertebro-basilar system accompanied by an increased vascular tone of spastic type and by an altered brain vessel reactivity. These data were an addition to the concepts about the state of collateral circulation (2, 6).

Our data summarized from the clinical, biochemical and electrophysiological investigations performed propose criteria for the early objectivization of risk factors in stroke patients' relatives with a view to their timely prophylaxis.

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## КЛИНИЧЕСКИЕ, ЭЛЕКТРОЭНЦЕФАЛОГРАФИЧЕСКИЕ И РЕОЭНЦЕФАЛОГРАФИЧЕСКИЕ КОРРЕЛЯЦИИ У РОДСТВЕННИКОВ БОЛЬНЫХ С МОЗГОВЫМ ИНСУЛЬТОМ

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## РЕЗЮМЕ

Сорок родственников (сыновей и дочерей) больных с мозговым инсультом были исследованы клинически, электроэнцефалографически, реоэнцефалографически, проведено также исследование липидного профиля, с целью обнаружить ранние клинико-лабораторные критерии начального этапа сосудисто-мозговой недостаточности. Полученные результаты были сопоставлены с соответствующими результатами контролной группы из 30 здоровых лиц без наследственной отягощенности заболеваниями сосудов. У всех родственников были установлены субъективные жалобы на головную боль, головокружение, быструю утомляемость, а также пониженные возможности памяти и повышенное диастолическое кровяное давление. ЭЭГ-картина показывает данные о дисфункции мезодиэнцефальных мозговых структур, а на РЭГ снижен индекс кровенаполнения и спастично повышен тонус глобального ОМ и регионарного ОМ отведений. Полученные статистически значимые результаты корреспондируют с патологическими отклонениями в липидном обмене и представляют собой прогностические критерии при раннем диагностицировании мозговой сосудистой недостаточности.