Study of Cerebral Vascular Manifestations to a Lot of Chronic Alcoholic People

ADRIANA NICOLAEȘCU(1), SIMONA GUSTI(2), ANDRITOIU A.C. (3),
ARISTIDA GEORGESCU(4)

(1) University Hospital of Neurology, Craiova; (2) Department of Physiology, Faculty of Medicine, University of Medicine and Pharmacy, Craiova; (3) Military Hospital, Craiova; (4) County Emergency University Hospital, Craiova

ABSTRACT

The authors studied the electrical and cerebral irrigation to a lot of 41 male patients with chronic alcoholism, 25-55 year old, using non-invasive methods: EEG and vascular Doppler ultrasound method (D). The selected patients were hospitalized for the first time and they had no clinical or biological symptoms of liver or nervous system disorders. We determined the systolic and diastolic blood pressure and the cardiac rate, in clino and ortostatism. We recorded the EEG with a Bioscript 2000. We used a echo-Doppler Aloka colour and Angio Power with a sonde of 4,5 MHz and a Siemens Sonoline versa Plus Doppler colour and Angio Power with a sonde of 7,5 MHz for registration of common carotidian D. curves. We analyzed the D. curves parameters to the studied lot and by comparison to a control lot of 40 healthy people who did not consume alcohol. We remarked a decrease of diastolic pressure and a vaso-motor tonus lability. We remarked an increase of resistance index with 17% explained by the presence of generalized and cerebral hyper tonicity. On the EEG we remarked a theta waves with 12% incidence (insignificant correlation r =0,24, with systolic speed).

KEY WORDS chronic alcoholism, vascular Doppler ultrasound method, vascular hyper tonicity

Introduction

Since 1988, O.M.S. put alcoholism on the top of the problems of world health, near of cardio-vascular diseases, cancer, ageing problems and aids. Made by his severe complications: neurology, liver, cardio-vascular, impose today a three-dimensional study: medical, psychological and sociological.

If regarding miocardiopatia they become to his recognition as a separate entity, there are some studys published in this domain, in literature there are no dates concerning vascular manifestation made by cronic alcoholism and specially of those cerebral.

Starting of those reasons, we made a complex clinical and paraclinical study of the electrical activity of brain irrigation to a lot of male persons who suffer from chronic alcoholism

Material and Methods

We studied the electrical and cerebral irrigation to a lot of 41 male patients with chronic alcoholism, 25-55 year old, the selected patients were hospitalized for the first time and they had no clinical or biological symptoms of liver or nervous system disorders, using noninvasive methods: EEG and vascular Doppler ultrasound method (D).

We determined the systolic and diastolic blood pressure and the cardiac rate, in clino and ortostatism. We recorded the EEG with a Bioscript 2000. We recorded computerized tomography of 80% of patients that we reviewed to PRIMA MEDICAL center

In exploring cerebral vascular device used Aloka Echo Doppler and color Angio Power with a probe of 4,5 Mhz and a Siemens Sonoline versa Plus color and Power Doppler Angio provided with a linear probe for vessels 7,5 Mhz; devices incorporate a computer that is reat velocimetrics parameter D, and reveals the image curve D artery explored.

Non-invasive method exploration vascular D.is based on the principle of Doppler-Fizeau expressing gap in frequency between a denmark where ultrasonore reflected by a moving mobile bloodstone in relation to an incident ultrasound denmark.

Examination followed three steps- getting the signal noise level D, to artery exploring, recording and calculating the parameters of the curve D.

Audio signal consist of two parts: first part is a broad signal, the sharp high-frequency and short
representing movement in systolic blood flow and the second is a sound signal less intense, lower frequency, but longer, being flow generated by the recoil in diastole blood flow.

Curve D. velocimetric complex or basic, consists of a first large positive wave, which express the systolic blood flow followed by one or two where the positive side of lower wave amplitude as initially expressing peripheral resistance and elasticity of arteries investigated (Ene Gabriela 2006).

Complex velocimetric D. depends on a vessel size, vascular mall elasticity and the type of Xmp6 sector arteriolo-capillary flow or intended. Vascular elasticity is determined for the complex profile. Important to you that the Windkessel effect in systolic arteries dilate and store a quantity of blood which then returned in diastole. Loose of vascular wall elasticity lengthen time and reduce systolic flow and secondary wave (Andritoiu A.C.2002 ).Type of sector arteriolo-capillary downstream the dominant factor regulation of flow, speed of blood vessels. (Franceschi 1986)

Thus carotid arteries have a characteristic laminate flow, the central velocities are greater than the peripheral, there is a spectral window in the D. and D. pant color shades are found in more open central portion of the vessel and close to the periphery. Internal carotid artery resistance is low and less variable, with low pulsatility (Zwiebel J.W. 2000).Laminar flow are pure color, the turbulent marked by adding the color green color base, resulting in shades of orange or turquoise, with blood flow speed is part of mosaic.

Regarding the D curves at the common carotid arteries (ACC) and internal (ACI) parameters we considered the following classics:

-systolic velocity,
-diastolic velocity,
-resistance index (IR), proposed by Pourcelot is a report of VmaxS-VmaxS (VmaxS- is maximum systole velocity , VmaxD- is maximum dyastole velocity);
-carotid distensibility index IDC- VmaxS (cm/s)-VD(cm/s) ( Dудeа S.M., Radu I. Badeа, 2004);
-pulsatility index (IP) Goslin - humeral diastolic pressure (mmHG) / diastolic velocity (cm/s) + 1.


**Results and Discussions**

Due to generalized vascular hypertonia it was observed that values of the arterial pressure are to the inferior level of normal value for systolic blood pressure (average - 110 mmHg) and also a small increase of the diastolic blood pressure (average - 80 mmHg). When the body changes its position from clinostatism in orthostatism it can be observed a small decrease of the systolic arterial pressure (average 100 mmHg) and of the diastolic pressure (average - 85 mmHg). In young healthy people, the negative inotrope action of the ortostatism can be seen in acceptable limits, the compensatory mechanism beeing welcome (HAulicit 1., 2000, Guyton A., 2000, GregerR., Windhorst U., 1996, Gusti S). In people with chronic alcoholism, capacity of selfadapting mechanisms is decreased, being a lability of the vasomotor tone that explines the discrete orthostatic hypertension in these patients. Cardiac frequency is increased to10% (average - 77/ minute) compared with the witness group of persons that do not drink alcohol (thanks to the adrenergic reaction).
From analysis of the carotid D curves and D parameters in the studied group compare with witness group formed by 40 healthy persons from biological and clinical point of view, that do not drink alcohol (fig. I and 2 table I)

**Table 1 Doppler curves parameters – test group –**

<table>
<thead>
<tr>
<th>Doppler Curves Parameters</th>
<th>Joint Right Carotid Artery</th>
<th>Joint Left Carotid Artery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syntolic Velocity (M/S)</td>
<td>0.91 ±0.03 3.2%</td>
<td>0.9 ±0.05 5.5%</td>
</tr>
<tr>
<td>Diastolic Velocity (M/S)</td>
<td>0.36 ±0.03 8.3%</td>
<td>0.35 ±0.06 17.1%</td>
</tr>
<tr>
<td>Resistance Index</td>
<td>0.64 ±0.04 6.25%</td>
<td>0.63 ±0.04 6.3%</td>
</tr>
<tr>
<td>Perfusion Index</td>
<td>5 ±0.2 6%</td>
<td>4.8 ±0.4 8.3%</td>
</tr>
<tr>
<td>Carotidian Distensibility Index</td>
<td>9.58 ±0.8 8.3%</td>
<td>9.3 ±1 10.7%</td>
</tr>
</tbody>
</table>

We observed that: -the decrease of the VS by 16% on right ACC and 15% on left ACC from that resulting a decrease of the irigation in cerebral blood flow (fig. 3 and 4 table II);

**Table 2 Doppler curves parameters – test group with chronic alcoholism**

<table>
<thead>
<tr>
<th>Doppler Curves Parameters</th>
<th>Joint Right Carotid Artery</th>
<th>Joint Left Carotid Artery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syntolic Velocity (M/S)</td>
<td>-16% 0.76 ±0.06 7.8%</td>
<td>-15% 0.76 ±0.05 6.5%</td>
</tr>
<tr>
<td>Diastolic Velocity (M/S)</td>
<td>-6% 0.33 ±0.03 9.09%</td>
<td>-7% 0.32 ±0.04 12.5%</td>
</tr>
<tr>
<td>Resistance Index</td>
<td>+17% 0.74 0.04 5.4%</td>
<td>+16% 0.73 ±0.05 6.8%</td>
</tr>
<tr>
<td>Perfusion Index</td>
<td>-3% 4.85 ±0.3 6.1%</td>
<td>-4% 9.1 ±0.8 8.7%</td>
</tr>
<tr>
<td>Carotidian Distensibility Index</td>
<td>-5% 9.1 ±0.5 5.4%</td>
<td>-4% 9.1 ±0.8 8.7%</td>
</tr>
</tbody>
</table>

The most important thing is the increase of IR by 17% on right ACC and by 16% on left ACC and that it is explicable due to the generalized hypertonia (the increase of the diastolic arterial pressure) but also in cerebral territory and that put some questions above increasing of the resistance in vascular cerebral territory, and this explains the decrease of the cerebral blood flow;

-it is interesting to note that the increased IR correlated very well from statistical point of view with increased diastolic pressure due to generalized vascular hypertonia (r=0.88);

-due to the fact that evaluated persons are quite young (25-55 years), without atherosclerosis, the perfusion index and carotidian distensibility do not change significantly compared to the test group.

In 5% from studied patients we observed the presence of the theta waves (around 12%) spread in a diffuse way, all over on cortex, not being affected by hyperpnea or flashlight. Between the presence of these waves and vascular parameters D (VS), there is an irrelevant link. It is mentioned in specialized literature that in persons who drink alcohol around 1 to 5 years there is an unilateral cortical atrophy, and in persons who drink more than 5 years there is a bilateral cortical atrophy.

In our study, computer tomography reveals unilateral cortical atrophy in 85% people who drink alcohol in less 5 years.

**Opinion**

1. Consumers of alcohol for a period between 1 and 5 years is a remark lability vaso motor tone of hypertonic generalized, caused by a reaction adrenergic,
2. Non-invasive method of vascular exploration by Doppler ultrasound showed the study group significant reductions of cerebral vascular filling the background of a generalized vascular
hypertonia and brain, changes that occur early enough
3. This unilateral cortical atrophy in computerized tomography of alcohol consumers and major modifications cerebral irrigation (even those who do not have periods longer than 5 years), requires making a campaign of mass health education, regular medical checks...

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16. Udristoiu A., ( )-

Corresponding Adress: Adriana Nicolaescu MD, University Hospital of Neurology, Craiova