

❖ **KINETOTHERAPY****BRAIN ATROPHY AND MELOOTHERAPY: CLINICO-IMAGING CORRELATIONS**Hancu A.¹, Docu Axelerad Any¹, Adam T.¹, Docu Axelerad Daniel², Damian Mirela², Niscoveanu A.³¹University „Ovidius” Constanta, General Medicine Faculty, ROMANIA²University „Ovidius” Constanta, Sports and Physical Education Faculty, ROMANIA³Neurology clinic, Constanta county emergency hospital, ROMANIA

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Abstract

Our study presents correlations between brain atrophy measured by CT-scan images and clinical diagnostics of these patients and the way in which melotherapy modify possible associated depression.

Material and method: Our study consisted of 210 patients admitted to Neurology Department Constanta between June-December 2007 and diagnosed (by means of brain CT-scan done in the first days from admission) with diffuse brain atrophy in majority of cases and secondary to a neurologic affection. For all patients we performed BECK depression scale. Our patients were submitted to a musical program consisting in 15 minutes, three times a day. We divided the study group in four smaller group.

Results: The majority of our patients proved to have two or more risk factors, specially hypertension and dyslipidemia, age over 61 in 80%. Brain atrophy was present in almost half of patients. On Beck scale evaluation we discovered medium and severe degree of depression. Patients with brain atrophy associated with Binswanger's disease were presenting pseudobulbar syndrome associated or not with gait disturbances, with or without dementia, and leukoaraiosis on CT-scan.

Conclusions: The majority of our patients were age over 61. Hypertension is the main risk factor. Correct treatment of arterial hypertension, dyslipidemia, diabetes mellitus and other cerebral vascular risk factors delays development of brain atrophy.

Melotherapy seems to have a positive impact in patients with acute ischemic stroke, and less important in those with large brain atrophy and Binswanger disease.

Keywords: brain atrophy, CT-scan, vascular brain diseases, risk factors, associated diseases, lacunarism, leukoaraiosis.

Introduction

Brain atrophy (A.H. Ropper, 2005) diagnosed by CT-scan can be:

- 1) Cortical atrophy: superficial sulci are widened due to atrophy and retraction of circumvolution, which separate them, but cerebral ventricles are of normal size.
- 2) Subcortical atrophy: ventricular system is widened due to existence of internal communicating hydrocephalus, but cerebral cortex is normal.
- 3) Mixed cerebral atrophy (cortico-subcortical): sum of first two types together.

Cerebral atrophy (A.M. Samuels, K.S. Feske, 2003) can be localized or diffuse, secondary or idiopathic.

Our study presents correlations between brain atrophy measured by CT-scan images and clinical diagnostics of these patients and the way in which melotherapy modify possible associated depression.

Material and method:

Our study consisted of 210 patients admitted to Neurology Department Constanta between June-December 2007 and diagnosed (by means of brain CT-scan done in the first days from admission) with diffuse brain atrophy in majority of cases and secondary to a neurologic affection. Only 2 patients were diagnosed

with localized brain atrophy secondary to trauma and in 3 patients we couldn't find any underling cause. The patients with vascular brain diseases were divided in four subgroups according to their diagnosis: first stroke, repeated stroke with neurologic sequelae, cerebral lacunarism and Binswanger's disease. Diagnosis on discharge was: primary stroke, repeated brain stroke with neurologic sequelae, cerebral lacunarism, Binswanger disease, Alzheimer's disease, Parkinson's disease, multiple sclerosis, chronic alcoholism or brain atrophy of unknown etiology, all cases with brain CT-scan image of brain atrophy. For all patients we performed BECK depression scale.

Results:

First group consisted in 100 patients admitted to Neurology Department with first acute stroke. Brain atrophy was revealed by CT-scan on 1-3 days from admission. We performed Beck depression scale and applied melotherapy to 80 patients, correlated with the degree of depression. The musical program consisted in 15 minutes three times a day.

Distribution according to sex was of 37 cases female and 63 cases male. The distribution according to age is seen in table 1 and the distribution according to urban-rural medium in figure 1.

Presence of brain atrophy in first days from brain stroke shows clear evidence of underlying risk factors (C. Arseni, 1982): arterial hypertension, diabetes mellitus, atrial fibrillation and presence of associated diseases: neoplasms with different localization, chronic alcoholism, epilepsy and brain trauma. All this items are seen in tables 2, 3, 4. Most of patients had two or more risk factors. On brain CT-scan we also found other imaging signs such as: lacunarism and leucoaraiosis (table 5).

In this group, cerebral lacunae and leucoaraiosis found on CT-scan are not associated with clinical symptoms.

Cerebral lacunae has a diameter between 3-4 mm and 1-2 cm; in our cases they are due to obstruction of small penetrating arteries branches of middle cerebral and vertebro-basillar arteries. In our study those 5 cases with brain lacunarism were associated with increased blood cholesterol, diabetes mellitus and old myocardial infarction.

Leucoaraiosis on brain CT-scan images is defined as (T. Scarabino, U. Salvolini, 2006): diffuse hypoattenuating anomalies at the level of brain white matter, with irregular border. (Fig. 2) Their presence indicate presence of other risk factors, the most important being arterial hypertension.

The results on first group were: 81% of patients older than 61, arterial hypertension present in 79% of cases and 61% cases with cortical atrophy. On the latest Beck scale evaluation we observed an improved depression in 75% of patients after melotherapy.

The second group in our study consisted in 55 patients with one or more strokes in their background.

They were 27 females and 28 males. The distribution according to age and urban-rural medium is seen in table 6 and figure 3. Most of the patients had two or more risk factors. (tables 7 and 8)

These patients were readmitted to our department for:

- a new stroke: 39 cases with brain infarct and 2 cases with hemorrhage (M. Sessa, 2008),
- vascular epilepsy: 12 cases,
- repeated stroke and vascular epilepsy: 2 cases.

Stroke was diagnosed clinically and by brain images. On brain CT we found also other imaging signs. (tables 9 and 10)

On Beck depression scale we identified 20 patients with medium and severe depression and we conducted a musical program consisting in 15 minutes of music three times a day.

For the second group of study the results showed: 73% of patients were with age of more than 61 years, and arterial hypertension was found in 91% of cases. On further evaluation on Beck scale, after

melotherapy, we observe an improvement of depression at 15% of patients.

Cortical brain atrophy was present in 31 cases and mixed brain atrophy in 23 cases, associated with brain lacunarism and leucoaraiosis in 16% of cases.

The third group consisted in 15 cases with discharge diagnosis of brain atrophy with lacunarism.

There were 5 females and 10 males. 12 patients were from urban medium and 3 from rural medium. Patients age is shown in table 11. Most of the patients had two or more risk factors. (table 12) We perform beck depression scale and apply melotherapy to 10 patients correlated with the degree of depression. The musical program consisted in 15 minutes, three times a day.

Imaging diagnosis of brain lacunarism correlated well with clinical features; the patients presented one of the following symptoms: ataxic hemiparesis, pure motor hemiparesis, dysarthria-clumpsy hand syndrome, and pure sensory stroke. (tables 13 and 14)

In the third group dyslipidemia was present in all cases, associated with diabetes mellitus in 8 cases and old myocardial infarction in 5 cases; most patients were with age more than 61 years old. On the latest Beck scale evaluation we observe an improve of depression in 25% of patients after melotherapy

The fourth group consisted in 18 patients with brain atrophy associated with Binswanger's disease.

Clinically the patients were presenting pseudobulbar syndrome, associated or not with gait disturbances, with or without dementia, and leucoaraiosis on CT-scan images.

There were 6 females and 12 males, 12 from urban medium and 6 from rural medium. Risk factors and imaging findings are shown in tables 15 and 16. On Beck depression scale we identify 10 patients with medium and severe depression and we conduct a musical program consist in 15 minute of music of three times a day.

The fourth group of our study revealed that all 18 patients, predominantly old males, were presenting with pseudobulbar syndrome associated or not with gait disturbances with or without dementia. Arterial hypertension and dyslipidemias were most frequent risk factors. On further evaluation of Beck scale after melotherapy we observe an improvement of depression at 5% of patients. Imaging features consisted in mixed brain atrophy and leucoaraiosis in the majority of cases.

Presence of diffuse brain atrophy of unknown etiology was found in 3 cases of 45, 58 and respectively of 65 years old, two female and one male, all of them with cortical brain atrophy. (table 17)

Localized brain atrophy was represented by two male patients of 21 and respectively 61 years old,

with background of brain trauma associated with temporo-parietal lobes.
epilepsy. Localization was of right and respectively left

Table 1 Age distribution in first group

Age	Number of cases
Below 40	0
41-50	3
51-60	16
More than 61	81

Table 2 Presence of risk factors in first group

Risk factors	Number of patients
Arterial Hypertension	79
Diabetes Mellitus	12
Atrial fibrillation	15
Dyslipidemia	52
Myocardial infarction/Cardiopathy	16

Table 3 Presence of associated diseases in first group

Associated diseases	Number of patients
Chronic Alcoholism	7
Cancer	10
Epilepsy	3
Brain trauma	2

Table 4 Types of brain atrophy in first group

Brain atrophy	Number of cases
Cortical	61
Subcortical	4
Mixed	35

Table 5 Other CT scan signs in first group

Other imaging signs	Number of cases
Lacunarism	5 cases
Leukoaraiosis	9 cases

Table 6 Age distribution on second group

Age	Number of cases
Below 40	0
41-50	5
51-60	10
More than 61	40

Table 7 Presence of risk factors on second group

Risk factors	Number of patients
Arterial Hypertension	50
Diabetes Mellitus	7
Atrial fibrillation	9
Dyslipidemia	18
Myocardial infarction/Cardiopathy	7

Table 8 Presence of associated diseases on second group

Associated diseases	Number of patients
Chronic Alcoholism	3
Cancer	2
Brain trauma	5

Table 9 Types of brain atrophy on second group

Brain atrophy	Number of cases
Cortical	31
Subcortical	1
Mixed	23

Table 10 Other CT scan signs

Other imaging signs	Number of cases
Lacunarism	3 cases
Leukoaraiosis	6 cases

Table 11 Age distribution on third group

Age	Number of cases
Below 40	0
41-50	1
51-60	2
More than 61	12

Table 12 Presence of risk factors in third group

Risk factors	Number of patients
Arterial Hypertension	5
Diabetes Mellitus	8
Atrial fibrillation	1
Dyslipidemia	15
Myocardial infarction/Cardiopathy	5

Table 13 Types of brain atrophy in third group

Brain atrophy	Number of cases
Cortical	2
Subcortical	1
Mixed	12

Table 14 Other CT scan signs on third group

Other imaging signs	Number of cases
Leukoaraiosis	12

Table 15 Presence of risk factors on fourth group

Risk factors	Number of patients
Arterial Hypertension	17
Diabetes Mellitus	2
Atrial fibrillation	1
Dyslipidemia	8
Myocardial infarction/Cardiopathy	3

Table 16 Types of brain atrophy on fourth group

Brain atrophy	Number of cases
Cortical	3
Subcortical	2
Mixed	13
Other imaging signs	Number of cases
Lacunarism	8
Leukoaraiosis	18

Table 17 Presence of brain atrophy in other diseases (rather than vascular brain diseases)

Disease	Male	Female	Below 40	41-50	51-60	More than 61	Cortical atrophy	Subcort. atrophy	Mixed	Associated disease
Multiple Sclerosis	1	2	0	1	2	0	1	0	2	0
Parkinson disease	1	2	0	0	0	3	1	0	2	1 Arterial hypertension
Epilepsy	5	3	1	2	5	0	7	0	1	0

Chronic alcoholism	3	1	0	1	2	1	2	0	2	2 Arterial Hypertension 1 Dyslipidemia
Alzheimer's disease	1	0	0	0	1	0	0	0	1	Dyslipidemia

Fig. 1 Distribution according to provenience medium on first group

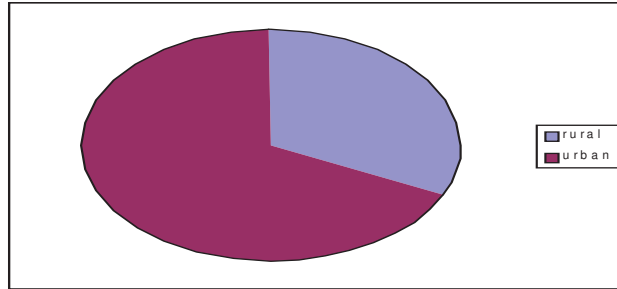


Fig. 2. B.E., 72 years old, known with arterial hypertension, admitted with left hemiparesis. CT-scan shows acute right parietal lobe infarction, mixed brain atrophy and leukoaraiosis.

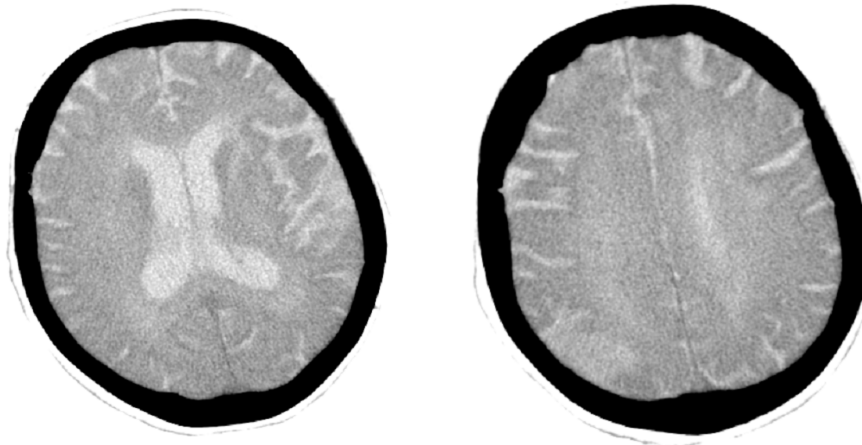


Fig. 3 Distribution according to provenience medium on second group

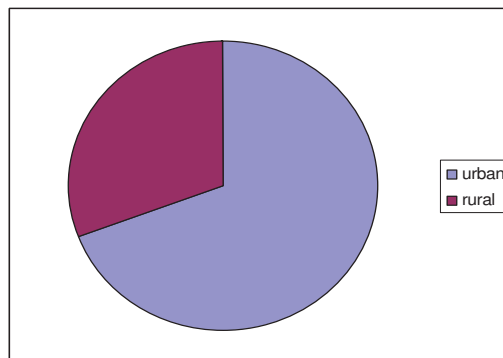


Fig. 4. T.V., 70 years old, known with arterial hypertension, chronic atrial fibrillation, right cerebellar infarction in 2003, admitted with right hemiplegia, mixed aphasia; brain CT-scan shows: acute left temporo-parietal infarction, an old right cerebellar hemisphere infarction, left thalamic lacunae, cortical brain atrophy and leukoaraiosis.

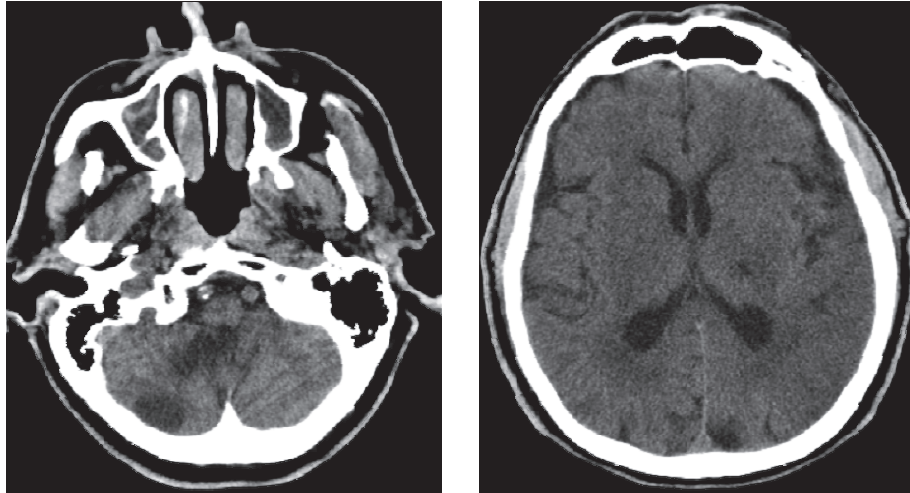


Fig.5. D.R., 65 years old, known with type 2 diabetes mellitus, arterial hypertension and hypercholesterolemia, admitted with left hemihypoesthesia. CT-scan shows mixed brain atrophy and right thalamic lacunae.



Fig.6. R.F., 67 years old, known with arterial hypertension, dyslipidemia, admitted for pseudobulbar syndrome, gait abnormalities, urinary incontinence, and memory disturbances with progressive evolution of about one year.

CT-scan shows: mixed brain atrophy, leukoaraiosis and cerebral lacunarism.



Conclusions:

The patients with vascular brain diseases were divided in four subgroups according to their diagnosis: first stroke, repeated stroke with neurologic sequelae, cerebral lacunarism and Binswanger's disease. They were diagnosed by CT-scan done in the first days from admission with diffuse brain atrophy.

There is dissociation between brain atrophy diagnosed by CT-scan and clinical examination of vascular patients. Presence of brain atrophy in the first days from acute stroke and the good status of patient some days ago is an example in this way.

In first two groups the principal risk factor was hypertension, age more than 61 years in 80% cases, brain atrophy was of cortical type in more than half of them.

In third group dyslipidemia was present in all cases, associated with diabetes mellitus in 8 cases and old myocardial infarction in 5 cases, most of the patients with age more than 61 years old.

Patients with brain atrophy associated with Binswanger's disease were presenting pseudobulbar syndrome associated or not with gait disturbances, with or without dementia, and leukoaraiosis on CT-scan. Arterial hypertension and dyslipidemia were most frequent risk factors founded in patients with age more than 61 years old.

Presence of brain atrophy in other diseases (rather than vascular brain diseases) was so reduced

because our neurology department is settled in an emergency hospital.

Presence of diffuse brain atrophy associated with other diseases (neoplasms with different localization, chronic alcoholism, epilepsy and brain trauma) rather than cerebral vascular diseases was in correlation with oldness of underlying disease.

The age is an important factor of risk.

Correct treatment of arterial hypertension, dyslipidemia, diabetes mellitus and other cerebral vascular risk factors delays development of brain atrophy.

Localized brain atrophy was only in correlation with brain trauma in all cases.

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THE EFFECT OF THE PARTICIPATION OF EDUCABLE MENTALLY RETARDED CHILDREN IN THE SPECIAL PHYSICAL EDUCATION CLASSES UPON THE ANXIETY LEVELS OF THE PARENTS OF THE CHILDREN

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Abstract

Mentally retarded children live by depending on their parents in accordance with their level of disabilities. The parents may develop certain psychological disorders due to having a mentally retarded child. The situation may affect their way of life and cause high levels of anxiety. Whereas the special physical education classes give the mentally retarded children an opportunity to learn how to do several activities on their own while enjoying themselves; they also help alleviate the dependency of children upon other people.

The research is built around a hypothesis which suggests that the parents of the children who participate in the special physical education classes are going to have a decrease in their anxiety levels.

The purpose of this study is to determine the anxiety levels for the parents of the children who participate and do not participate in the special physical education classes.

The research group consists of 16 couples whose children are receiving physical education classes, which makes a total of 32 parent subjects.