

LUCIAN BLAGA UNIVERSITY FROM SIBIU

MEDICAL FACULTY VICTOR PAPILIAN

DOCTORATE THESIS

**The under clinic hypothyroidism, risk factor
for the cerebral vascular accidents**

Summary

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Abbreviations used in the text

AACE American Association of Clinical Endocrinologists

AIT transitory ischemic accident

ApoAV apolipoprotein AV

Atg antitiroglobulinic antibodies

ATPO antiperoxid anti bodies

ATS atherosclerosis

AVC the cerebral vascular accident

CETP colesteril ester

CT total serum cholesterol

ET 1 endotelina 1

HDL-C seric cholesterol of high density
HMG- CoA 3 hidroxide 3 metilglutaril-coenzima A
HiSC under clinic hyper tyroidism
HoCM hypothyroidism clinic manifest
HTA arterial hyper blood pressure
HoSC under clinic hypo-tyroidism
HT tyroid hormones
IMC- body mass figure
IL 1interleukina 1
IL 6 –interleukina 6
INF interferon
HL- hepatitis lipase
LPL lipoprotein lipase
LDL-C-LDL cholesterol
LDL lipoprotein with low density
NT normo thyroidism
PP the pulse pressure
PCR the reactive C protein
T3 triiodothyronine
T4 tiroxine
TA arterial tension
Tad TA diastolic
Tas TA sistolic
Tam-TA average
Tadf- TA differentiated

TG trygliceride

TNF the factor of tumor necrosis

VLDL lipoprotein with very low density

THE MOTIVATION OF THE THESIS

The under clinic hypothyroidism manifest (HoCM), defined through values over the superior limit of TSH and with values under the normal limits of FT3 and FT4, associated with signs and clinic symptoms, it is one of the most frequent affections with which the practitioner doctor faces.

The under clinic hypothyroidism (HoTS), characterizes the situation in which TSH has high values, with normal circular levels of the free triiodothyronine (FT3) and of free tiroxine (FT4). HoTS among adult population has a prevalence till 10 % (14)

The normal value of TSH at the patients with under clinic hypothyroidism is situated between 0.05 and 4.50mU/L. Therefore, the diagnosis of the under clinic hypothyroidism is a laboratory one. The clinic consequences linked to the under clinic hypothyroidism remain a controversial subject, where from there is the necessity of taking a position regarding the necessity of treatment.

Although, the under clinic hypothyroidism is not totally clinically asymptomatic, the affection is associated with constipation, malfunction of concentration, muscular cramps, acroparesthesia, drier and cold teguments (signs and symptoms often met to old people).

Among possible complications of the under clinic hypothyroidism there are the brain vascular accidents, favored by induced hyperlipidemia by the deficit of hormones.

The research from the last years 10-15 years (21), demonstrates the association between the under clinic hypothyroidism and the ischemic brain and heart diseases. The risk of the ischemic cerebral diseases are correlated with hyper-cholesterol, the discreet chronic inflammation, which, together with other factors which modify the coagulation.

The deficit of thyroid hormones, even minor, is often associated with an atherogenic lipidic profile in which there are markers typical to atherosclerosis.(62;15;127)

Atherosclerosis and HoSC don't have a spectacular evolution, don't have a clinic expression marked from the debut; the moment they become clinically manifest are in an advanced state. In this context, the predictive factors of these affections are required to be discovered in order the patients should be advised to specific investigations (the thyroid hormones doses) in order to establish a diagnosis at the optimum time, preferably the nearest to the debut of the illness, to apply the proper treatment.

The link between hyper-cholesterol and the vascular cerebral accidents (AVC) was proved especially for transitory ischemic accidents (AIT) and is correlated with the level of LDL cholesterol (LDL-C); a diminishing with a moll/l of LDL-C is associated with the diminishing of the risk relatively from AIT with 19%. (7).

The substitutive treatment with synthetic thyroid hormones at the patients with clinic hypothyroidism improve the markers of ischemic risk, contributing to the improving the values of total cholesterol and of LDL-cholesterol. (37; 117)

The early diagnosis and the prompt treatment of the under clinic hypothyroidism reduce the risk of cerebral ischemic events.

The active and early discovery of the under clinic hypothyroidism through systematic screening of the population would diminish the risk of cerebral vascular accidents on a large scale.

The early diagnosis of HoSC at the patients with AVC risk is the theme approached in the present thesis. The theme of this thesis hasn't been studied at the national level, and at the international level there are a few studies, most of the times with contradictory results.

Due to a fewer information at the international level and their lack at the national level the idea of this research appeared.

THE PRESENT STATE OF KNOWLEDGE

THE UNDER CLINIC HYPOTHYROIDISM

The under clinic hypothyroidism represents a state of light thyroid insufficiency (TSH of 4,5m UI/l- 10m UI/l or moderate (TSH. >than 10m UI/l) characterized through a higher TSH compared to the superior limit of the established normal values compared to the method of dosing, associated with normal concentrations of thyroid hormones.

The prevalence of the under clinic hypothyroidism depends in a direct way on the established superior limit of the level of TSH which is around 5uU/L in most laboratories. The incidence of under clinic hypothyroidism increases according to the age. At women, over 75 years old, the prevalence reaches at 20%.

In a natural way, the under clinic hypothyroidism evolves towards clinic hypothyroidism manifest, affection met at 3%-5% people.

The progressive annual rate of under clinic hypothyroidism towards clinic hypothyroidism manifest is of 3%.

There is a direct relation between the under clinic hypothyroidism and dyslipemia. Most studies show a tight relation between the increase of the values TSH and dyslipemia.

Dyslipemia can be the key indicator of the under clinic hypothyroidism.

Values at the superior limit or a little over the superior value of sanguin lipids show the under clinic hypothyroidism and the atheromas at the level of the carotid arteries are an indicator of progress of atherosclerosis.

THE LIPIDIC PROFILE IN HYPOTHYROIDISM

There is a direct relation between the under clinic hypothyroidism and dyslipemia. Most studies see a tight relation between the increase of the values TSH and dyslipemia.

Dyslipemia can be a key indicator of the clinic hypothyroidism.

Values at the superior level or slightly over the superior value of the sanguin lipids show under clinic hypothyroidism and the atheromas at the level of the carotid artery are an indicator of progression of atherosclerosis.

In the thyroid insufficiency we see an atherogen lipidic profile which increases the risk for AVC. The increasing of the TSH values are correlated with the increase of the cholesterol and viceversa, the diminishing of the values TSH under substitutive thyroid treatment in Hypothyroidism determines the lowering of the cholesterol level. The relation between hyper cholesterol and cerebral vascular accidents is proved.

The thyroid hormones have a role in balancing the synthesis, metabolism, and the mobilization of the lipids. At the patients with clinic hypothyroidism manifest there is an increasing of the total seric cholesterol, of lipo-proteins with a low density (LDL), of Apolipoprotein B, of lipoprotein (a), and possibly higher concentrations of triglyceride.

The modifications of the lipidic metabolism in the under clinic hypothyroidism are less clear. There are proofs that the total cholesterol, the cholesterol LDL and triglyceride are high at the patients with under clinic hypothyroidism, while lipoproteins with high density (HDL), cholesterol and LP (a) remain unchanged (116).

It was proved the higher prevalence of the under clinic hypothyroidism in a population with hyper-cholesterol values, compared with a population with normal values of cholesterol. It has been concluded a significant reduction of the level of LDL cholesterol after administration of thyroxin to a group of patients with hyper cholesterol with basic concentrations of TSH situated at the superior level of the normal values (34).

We estimate that at 1% till 11 % from all patients with dyslipemia have under clinic hypothyroidism (117).

Some studies assert that patients suffering from untreated under clinic hypothyroidism have higher levels of the atherogen lipidic parameters, especially LDL-C and Lp (a) (41)

The reduced levels of thyroid hormones determine hyper cholesterol with high values of LDS. It is important the suspicion of a masked hypothyroidism or under clinic one at the patients with isolated hyper cholesterol, especially to old people. In these cases, at a value of LDS cholesterol higher than 4,1 mmol/l (higher than 160 mg/dl) TSH will be dosed.

The epidemiologic data from three studies of research based on population: Wickham Observation, The Study of the Prevalence of the Thyroid Disease in Colorado and the Study of Examining Food and Natioanl Health III –have shown that the prevalence of the clinic hypothyroidism, not diagnosed previously, is of 0,3-1% and appears more frequently at women than to men. The under clinic hypothyroidism is more frequent, being met at 4-10% from the multinational samples, increasing once with age so in the new decade of age might reach from 15% to 20% (21;26).

THE PERSONAL CONTRIBUTION

THE HYPHOTHESIS OF WORK AND THE OBJECTIVES OF THE RESEARCH

More and more specialized studies underline or deny the fact that the first multiple risk factors for cerebral vascular accidents are HoSC, too.

In the present thesis I intended to evaluate the association between under clinic hypothyroidism and the cerebral ischemic disease at patients suffering from under clinic hypothyroidism, who suffered cerebral vascular accidents, and also the fact if there is a specific way of showing the cerebral vascular accident at the patients with under clinic hypothyroidism.

Secondly, I intended to study the implication of the under clinic hypothyroidism as risk factor for the cerebral vascular accident and the prophylaxis and its treatment.

The global objectives of the research from this thesis were the evaluation of the presence of the under clinic hypothyroidism at a number of patients with cerebral vascular accidents, as well as the evaluation of the aggravation risk factors for AVC (dyslipemia, high blood pressure, the figure for body mass, atherosclerosis, pro-inflammatory factors), at the under clinic hypothyroidism.

The final objective of this thesis was the identification of a predictive factor, modifying one, for AVC- under clinic hypothyroidism- which should be clinically useful for guiding the patients and to be the subject to be approached by the doctor during consultations, to offer an adequate recommendation linked to the early diagnosis of the under clinic hypothyroidism and applying an adequate substitutive thyroid treatment.

The second half of the thesis is intended for personal research and it is structured in 5 studies.

THE GENERAL PRESENTATION OF THE PATIENTS AND OF THE METHODS AND PARTIALLY OF THE RESULTS

The importance of the theme

More than 1/3 from the general mortality is caused by cerebral vascular disease. So far, over 300 risk factors for AVC have been identified, many of these are not independent one from another and the number of risk factors really independent is reduced.

The term of cerebral vascular accident (AVC) does not apply to a human affection, but to a number of affections defined through the nature of cerebral and vascular wounds. So, as far as the vascular influence, there are four groups of AVC:

- 1) Hemorrhagia subaracnoidea
- 2) cerebral hemorrhage (HC)
- 3) transitory ischemic accident (AIC)
- 4) formed ischemic accident (AIC) or cerebral heart attack (IC)

Besides the accidents with arterial origin, there are more varieties of AVC defined through the presence of veins' thrombosis (TVC)

The complexity of AVC widens through other five eventual interconnections.

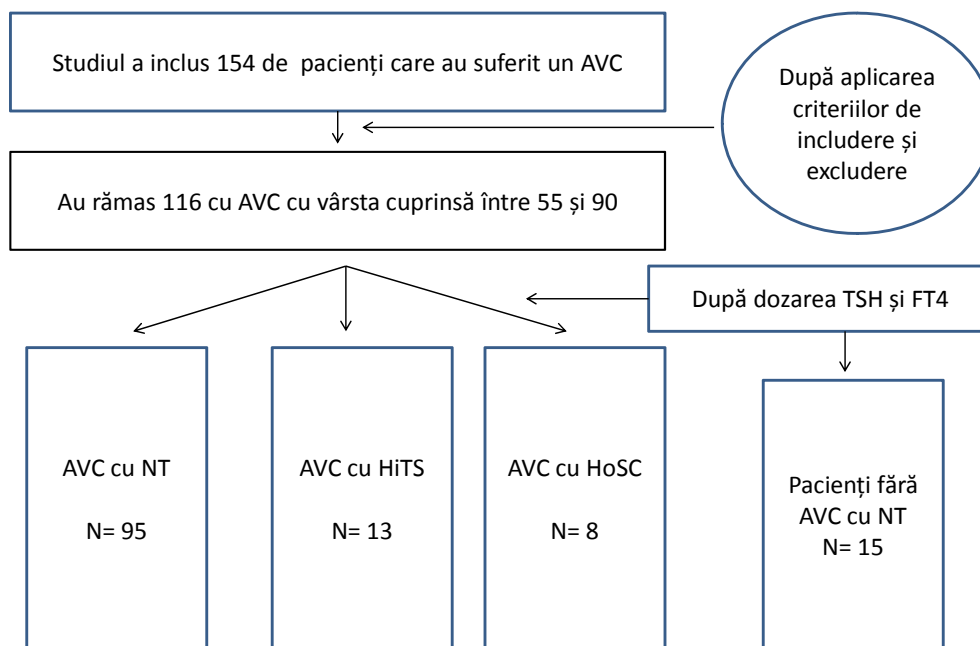
AVC are the first cause of handicap gained after traumatic accidents in the occidental countries, the second cause of dementia after Alzheimer disease, the second cause of mortality (responsible of 9% of deaths from the entire world), they are the major cause of depression and they are a special socio-economical burden, consuming 2-4% from the money for health from the world (107; 36)

Material and methods

Patients

The study included 154 patients who suffered an AVC, hospitalized in the Clinic of Neurology Asklepios from Seesen, Germany in 2011-2015 with the ages between 55 and 90. The criteria of including were based on the diagnosis of cerebral vascular accident clinically and para clinically demonstrated, excluding the patients who followed the treatment with Amiodarone, the previous diagnosis hypothyroidism or hyperthyroidism, severe obesity, chronic cardiac insufficiency, severe systematic diseases, chronic diseases of hepatitis, of kidneys, malignant tumors, patients without thyroid hormonal doses.

In the studies 2,4,5 the obtained results have been compared with the ones obtained on a number of 15 patients with normal thyroid (NT), without AVC signs and symptoms, with the ages between 61 and 80, hospitalized in the Clinic of Endocrinology from Sibiu between 2014-2015 (fig nr 1)



The Study included 154 patients who have suffered AVC

They remained 116 with AVC with ages between 55 and 90

after applying the criteria of including and excluding

The clinic and paraclinic diagnosis of AVC

The patients taken into this study were given the AVC diagnosis according to the clinic guides through clinic exam and para clinic investigations. The clinic signs, the most frequent met in AVC, were: for the injury of the left cerebral hemisphere (dominant) aphasia, hemiplegia, or right hemiparesis, hemianesthesia or right hemiparesis, lateral right hemianopsia, spontaneous deviation of the eyes towards the left, reading disorders, writing disorders, calculating ones; for the right hemisphere (non-dominant) left space negligence, anosodi-aphoria, ano-sognosia, hemiasomatognosie, hemiplegia or hemiparestesia on the left side, hemi anesthesia or hemiparesis on the left side, hemianopsia on the left side, deviation of the eyes towards the right, left sensitive extinction, cerebral trunk, cerebral posterior hemisphere, paralyzing or the loss of sensibility of the 4 members, the touching of the cranial nerves, non-coordination of the members, ataxia, dysarthrie, moves of the eyes, nystagmus, amnesia, disorders of the visual field, deep light infarcts or lacunary syndrome (hemispheric or cerebral trunk) pure movable hemiplegia, isolated sensitive deficit, dysarthrie, ataxic hemiparesis, sensitive motor syndrome. The para clinic exams included: IRM (sequences of diffusion and FLAIR, T1, T2.) or CT, Angio RMN or angio CT used for the exploration of the vascular inter-cranian.

Doppler echography was used for the vascular exploration of the extra cranian. Every patient was extra evaluated through EKG, EEG, thoracic radiography for complete diagnosis. Besides laboratory tests were executed: blood test, a blood ionograma, trombocytes, glycemia, hepatic tests, PCR, lipidograma, (normal values: cholesterol: 10-200 mg/dl; LDL cholesterol less than 130 mg/dl; triglyceride less than 530 mg/dl) at the analysed cases lombary puncture and oximetry have been made.

The diagnosis of the under clinic hypothyroidism

All the patients were exposed to thyroid function evaluation as part of routine evaluation for cerebral vascular events. The hormones dozes were achieved from blood from veins after at least 8 hours of fast, after a night of hospitalization for AVC. The test was immediately achieved after blood taking for the test.

For the dozes of TSH and FT4 was used the immunological method through CMIA (Chemiluminiscent Microparticle Immunoassay) with the Architect 4100 device of the Abbott Diagnostics Company, GmbH.

The euthyroidism was defined as TSH and FT4 with normal values. For TSH the normal value is between 0,35-4,94 uU/ml; the normal limits for FT4 are between 1,71-3,71 pg/ml.

The under clinic hypothyroidism was defined through TSH over the normal limit, with values between 5,00 and 10,00uU/ml with normal T4 between 1,71-3,71pg/ml.

The under clinic hypothyroidism was defined as a concentration of TSH over 4,94uU/ml with a level of FT4 under the normal value.

Among the patients with AVC were formed two groups: one with not diagnosed patients with HoTS, previously with cerebral vascular accident, and another one with patients with AVC

without HoTS. There weren't significant differences regarding age between the two groups (exception the presence of HoTS at the study case)

From the 154 patients with AVC, were included in the study, after the application of including and excluding criteria, a number of 116, with age between 55 and 90, from whom 72 were men and 44 were women.

For the analysis statistically there were randomly selected from the 67 patients with AVC without HoTS, with ages between 65 and 80, a number of 15 patients.

So, the group of patients taken in the study were:

- patients with AVC without the under clinic hypothyroidism
- patients with AVC and under clinic hypothyroidism
- patients with AVC and under clinic hyperthyroidism
- patients without AVC with normal thyroidism.

The statistic Analysis

The statistic analysis was achieved with the test Student and test Likelihood Ratio for the quantitative variables were expressed under the shape of average and deviation standard and 95 % CI for the average.

The general results

The synthesis of the results is presented in the figure number 2

The distribution of the patients with AVC

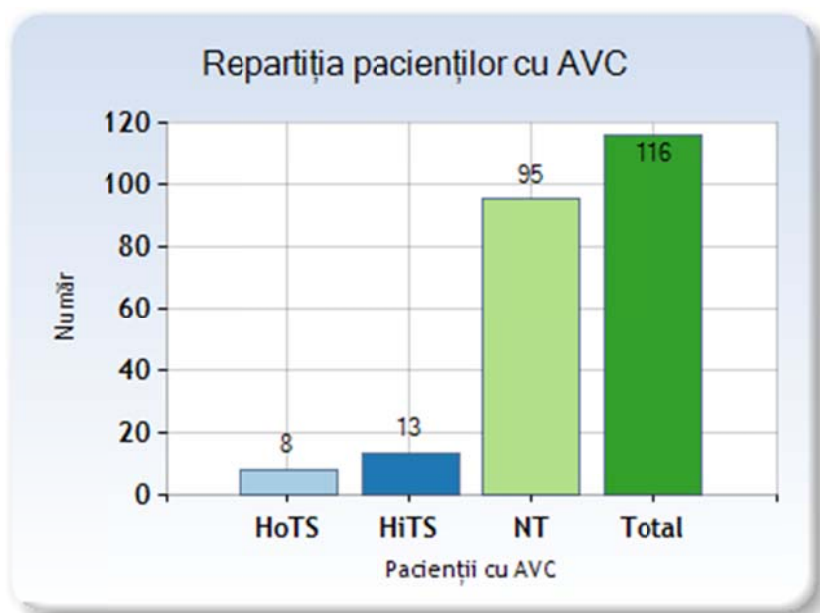


Figure number 2- The total number with AVC:116

The distribution of the patients with AVC and under clinic thyroid malfunctions

After the lowering of the patients with under clinic hypothyroidism from the total number of the patients, we see that from 103 patients with AVC, 8 patients (7,76 %) had under clinic hypothyroidism .After the decreasing of the patients with hypothyroidism from the total number of patients results that from 108 patients with AVC, 13 (12.03%) had clinic hypothyroidism.

The incidence HoTS is bigger, 10,70% if we report only to 67 patients with AVC between 61 and 80 year old, age group in which are included the 8 patients with HoTS (figure number 3)

Patients between 61 and 80 years old (N=67)

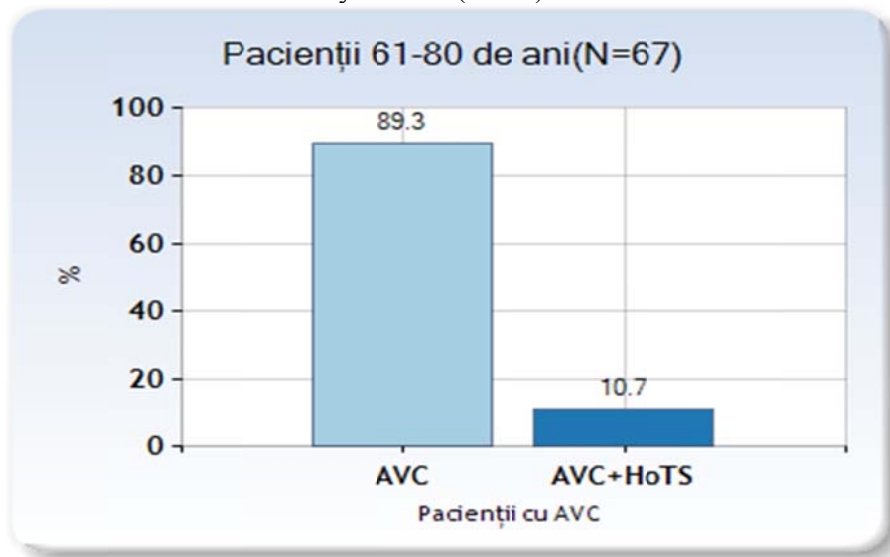
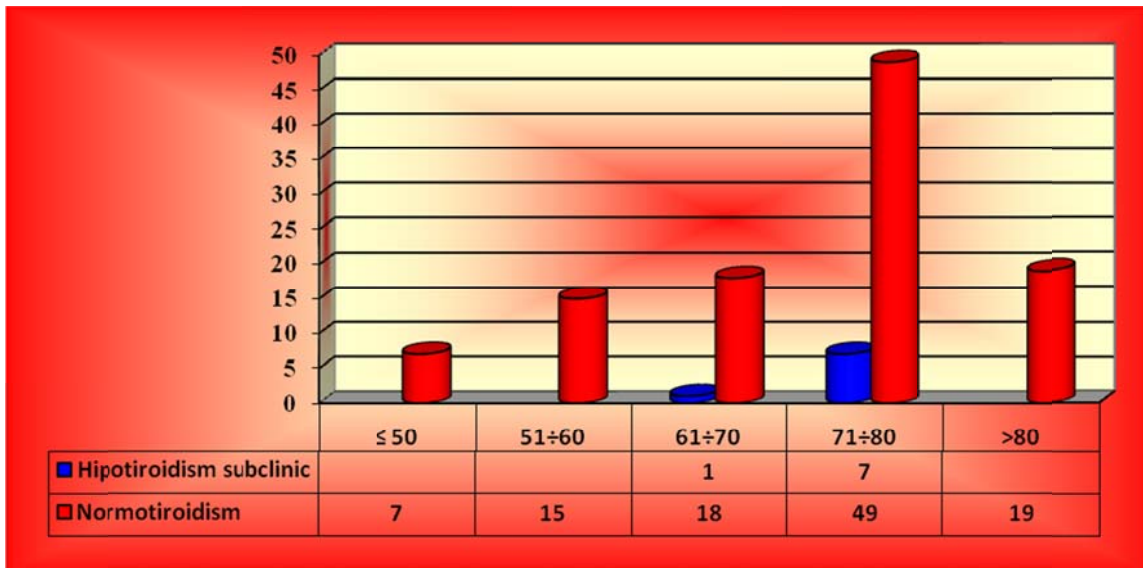


Figure nr 3. The incidence bHoTS at 67 patients with AVC between 61 and 80

All the patients with under clinic hypothyroidism were included (PLikelihood ratio) in the group of ages between 61-80 (figure number 4).



under clinic hypothyroidism

normal thyroidism

It can be observed that under clinic hypothyroidism, in the studied group is present at the patients between 60 and 80 years old.

Comparatively, patients with normal TSH and AVC were older, 76,14 plus /minus 9,72 years compared to the patients with bigger TSH and normal FT4, the average age of those being 72,62 plus /minus 7,12 years.

HoTS was more frequent to women:62,5 %

The under clinic hypothyroidism was more frequent to men: 76,6%

The localization of AVC

The distribution of the patients reported to the location of AVC is presented in the table number 4

Location

Location of AVC (AIT, IC, HC)	Patients with AVC without HoSC	Patients with AVC and HoSC	Patients with AVC and HiSC	Total patients
AMS	36 (42,3%)	4 (50,0%)	6 (46,1%)	46 (39,60%)
AMD	29 (34,1%)	3 (37,5%)	3 (23,0%)	35 (30,10%)
APS	11 (12,9%)		2 (15,30%)	13 (11,20%)
GB	7 (8,2%)	1 (12,5)	2 (15,30%)	10 (8,60%)
AVB	2 (2,3%)			2 (1,70%)
Total	85	8	13	116

Table number 4: The distribution of the patients reported to the location AVC. AMS the cerebral left artery; AMD- the right cerebral artery, the posterior cerebral artery, GB the basical ganglions, AVB the basilar vertebral artery.

Type of AVC

The form of AVC to the patients with AVC and HoTS versus patients with AVC and without HoTS is presented in the Table nr.5

	Patients with AVC and HoTS N = 8	Patients with AVC without HoTS N =93
Transitory ischemic stroke	1 (12,5%)	15 (16,41%)
Cerebral infarct	6 (75,0%)	67 (72,04%)
Cerebral hemorrhage	1 (12,5%)	11 (11,82%)

Table number 5. The form AVC at the patients with AVC and Ho TS versus patients with AVC and HoTS

In order to compare the biological parameters at the patients with AVC and under clinic mal thyroids from the total of 67 patients with AVC without under clinic thyroid disorders with ages between 61 and 80, or especially random, 15 patients as being the witness group.

Conclusions

HoTS is associated with a high cerebral vascular risk

Factors which contribute to the increasing of the risk are dyslipaemia, the chronic inflammation, the high blood pressure, overweight present in HoTS. All pathological factors interact one to another, none of them seems to play a decisive role alone. The above mentioned pathological factors produce endothelial dysfunction the first stage in the development of atherogenesis.

Study number 1, entitled the “Standard Lipidic Evaluation at the patients with AVC normal thyroid versus the patients with AVC and under clinic Hypothyroidism,

starts from the working hypothesis that a) dyslipemia and atherosclerosis with the most frequent complications of the under clinic hypothyroidism AND THE RISK OF atherosclerosis correlated with the under clinic hypothyroidism is actually asserted or on the contrary denied. The objective of this study 1 was the investigation of the lipidic profile as risk factor for the patients with AVC and under clinic hypothyroidism reported to the patients with AVC with normal thyroid.

Results and debates

The group	Age	TSH(M±DS)	FT4(M±DS)	FT3(M±DS)
NT+AVC	75.5±5.59 73.9 ± 4.60	1.44±0.48	1.32± 0.25	1.52±0.62
HoTS+AVC	73.9 ± 4.60	7.27± 2.11	1.06±0.19	1.64±0.28
p	p>0.05	p<0.05	p>0.05	p>0.05

Tab. nr. 1.4. Values TSH, FT4 și FT3 at the patients with normal thyroid (NT) with AVC and at the patients with under clinic hypothyroidism (HoTS) and AVC

Patients with AVC	Col M±DS 95%CI	LDL-Col M±DS 95%CI	TG M±DS 95%CI
NT+AVC	166.06±74.71 131.2 - 200.9	117.8±31.88 99.15 -136.4	177.67± 130.33 116.1 - 239.2
HoTS+AVC	202.12±47.55 152.8 - 251.4	124.25±39.83 98.71 -149.8	135.38± 73.64 51.12 - 219.6
p	p<0.05 p<0.10	p<0.05 p<0.10	p<0.05 p<0.10

Table number 1.5. the values of cholesterol (Col), and LDS Cholesterol (LDS Col) and triglyceride (TG) at the patients with normal thyroid values (NT) with AVC and at the patients with under clinic hypothyroidism (HoTS) and AVC

In our research the level of the total seric cholesterol was higher (202,12 plus/minus 47,55mg/dl) at the patients with under clinic hypothyroidism reported with patients with AVC normal thyroid (166,06 plus/minus 74,71mg/dl)but the difference wasn't significant from the statistical point of view. (p 0.05)

The level LDL- Col was also high in the case of patients with AVC and hypothyroidism (124.5 plus/minus 39,83 mg/dl)compared to the patients with AVC without under clinic

hypothyroidism (117.8 plus/minus 31,88 mg/dl) the difference was not statistically significant (p 0.05)

TG triglyceride were higher (177.67 plus/minus 130.33 mg/dl) at the patients with normal thyroid with AVC compared to the ones with under clinic hypothyroidism (135.38 m plus/minus mg/dl), but the difference was not statistically significant (p 0.05)

To most patients with under clinic hypothyroidism there was an increasing, but, NS of the atherogenetic parameters, mainly of LDL-C (124.25 plus/minus 39.83mg/dl) and the total seric cholesterol (202.12 plus/minus 47.55 mg/dl) The explanation that the near lipidic parameters of values considered normal might be the fact that the greater part of the patients with AVC, with or without HoTS were before the cerebral accident under lipid lowering medication.

Conclusions

1. The role HoTS as risk factor for AVC is sustained by recent meta-tests.
2. in our research, to most patients with HoTS it was noticed an increasing of the atherogenetic parameters, mainly of LDL-C (124.35 plus/minus 39.83 mg/dl) and of total seric cholesterol (202.12 plus/minus 47.55 mg/dl)
3. The triglyceride for both groups were between normal limits (, 530 mg/dl).
4. The explanation that the near lipidic parameters to the values, considered normal, might be the fact that the greater part of the patients with AVC, with or without HoTS were before the cerebral accident under lipid lowering medication.
5. It remains to establish if HoTS is a risk factor for AVC through its effect of favoring atherosclerosis (hyper-cholesterol, the increasing of LDL-col) or has as effect per,se independent.
6. Hyperlypemia and the presence of atheromatous plagues, more frequently met to the patients with AVC and HoTS compared to the patients with AVC without HoTS suggests that the thyroid hormones deficit or the excess of TSH might be independent risk factors for the cerebral vascular disease.
7. The results of the present research sustain the existence of a correlation between the under clinic hypothyroidism and the atherosclerotic changes of the lipidic profile. It was noticed an association between the increasing of the TSH and the atherogenetic profile (the increasing of the total cholesterol level and LDL-col)

Study number 2

CORRELATIONS BETWEEN THE VALUES OF THE ARTERIAL PRESSURE AND THE LEVEL OF THE THYROID HORMONS IN BLOOD AT PATIENTS WITH AVC

Estimates the involvement of the under clinic hypothyroidism in the apparition of HTA and of the increasing risk of AVC, compared to the patients with AVC, normal thyroid, starting from the hypothesis that the under clinic hypothyroidism is frequently associated with arterial hyper pressure and bradycardie, but it is not clear that this fact is true for the under clinic hypothyroidism.

Results and debates

Table number 2.4 the Comparison of the followed variables for the two groups of patients

The measured variables	AVC+ HoTS	AVC without HoTS	Test T Student
Number of patients	8	15	
Age (years)	72.75±4.86	73.87±5.59	P=0.319 p<0.05 (NS)

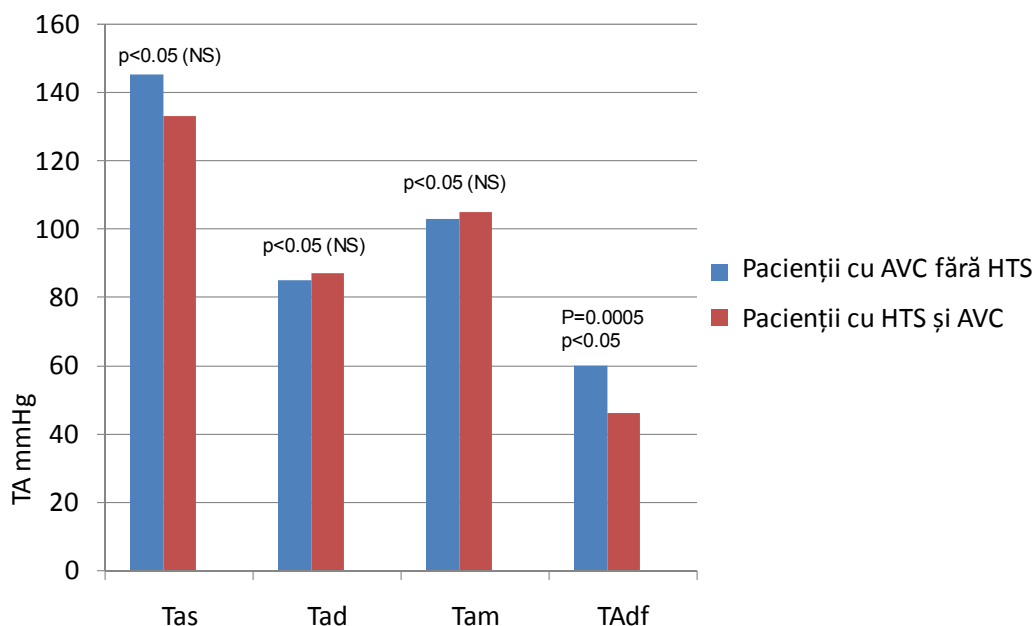
Men	3	7	
Women	5	8	
TSH (0,35-4,94 µU/ml)	11.33±4.93	1.44±0.47	P=0.001 p<0.05
FT4 (0,7-1,48 ng/dl)	1,20±0,14 ng/dl	1,10±0,17 ng/dl	P=0.367 p<0.05 (NS)
Tas (< 120 mmHg)	133.75±14.33	145.33±18.27	P=0.067 p<0.05 (NS) p<0.01
TAd (< 80 mmHg)	87.5±9.26	85.67±11.63	P=0.352 p<0.05 (NS) p<0.01 (NS)
TAm	105.53±13.55	103±10.03	P=0.641 p<0.05 (NS) p<0.01 (NS)
TAdf	46.25±9.91	60.33±7.67	P=0.0005 p<0.05

After the research and of the statistic calculations were found significant values statistically increased of the pressure of the pulse, phenomenon which can be considered as indicator of the rigidity of the arterial wall in the under clinic hypothyroidism.

We assert that the hyper blood pressure patient, early diagnosed with under clinic hypothyroidism and treated with thyroid substitution might avoid the anti hyper blood pressure treatment and the AVC risk.

The values TA at the patients with AVC

Valorile TA la pacienții cu AVC



TAs had lower values (M plus/minus DS: 133.75 plus/minus 14.33) at the patients with AVC and HoTS, compared to the patients suffering of AVC but without HoTS (M plus/minus DS 145.33 plus/minus 18.27) the last ones showed , if we take into consideration the values TAs, pre-high blood pressure or high average arterial blood pressure.

As far as TAs is concerned, this was higher at the patients with AVC and HoTS (87.5 plus/minus 9.26 compared to Tad at patients without HTS (85.67 plus/minus 11.63) although

from the statistic point of view, the Tad differences were insignificant. The same thing can be asserted about Tam.

The greatest differences ($p < 0.05$), in our research have been noticed for TAdf values. TA difference or the pressure of the pulse is given by the difference between symbolic systolic TA and diastolic Tam.

The biggest differences ($p=0.05$), in our research were evident for TAdf values. The differentiated TA or the pressure of the pulse is given by the difference between systolic TA and diastolic TA

Its modifications define two types of TA: a) divergent: the Systolic Ta increases, and the diastolic TA decreases and b) convergent: the systolic TA decreases and diastolic TA increases. TA df at patients with HoTS was 46.25 plus/minus 9.91, while the normal thyroids with AVC was 60.33 plus/minus 7.67

Conclusions

1. Our research confirmed the fact that under clinic hypothyroidism might increase the risk of diastolic arterial pressure.
2. The significant higher values of PP, can be considered as indicator of the arterial rigidity in the under clinic hypothyroidism.
3. The high blood pressure patient, early diagnosed with under clinic hypothyroidism and treated with thyroid substitution might reduce, too, the high level of cholesterol and implicitly the total cerebral vascular risk.
4. The screening of the hypothyroidism is essential if the patient has a higher level of cholesterol, overweight and high PP. The early diagnosis and the substitution thyroid treatment applied in due time, might cause to the reduction of the cardio vascular risk.
5. More prospective studies must be done in order to confirm the association between the under clinic hypothyroidism and the increasing of the arterial pressure values.

In the **study number 3.**

THE EVALUATION OF THE PREVALENCE OF THE ATHEROMATOS CAROTID PLATES AT THE PATIENTS WITH UNDER CLINIC HYPOTHYROIDISM AS RISK FACTOR starts from the idea that the dyslipemia is one of the most important risk factors for carotid atherosclerosis. The aim of the study was the evaluation of the presence of the atherom plates in the lumen of the carotid artery as an extra risk factor for AVC at the patients with under clinic hypothyroid.

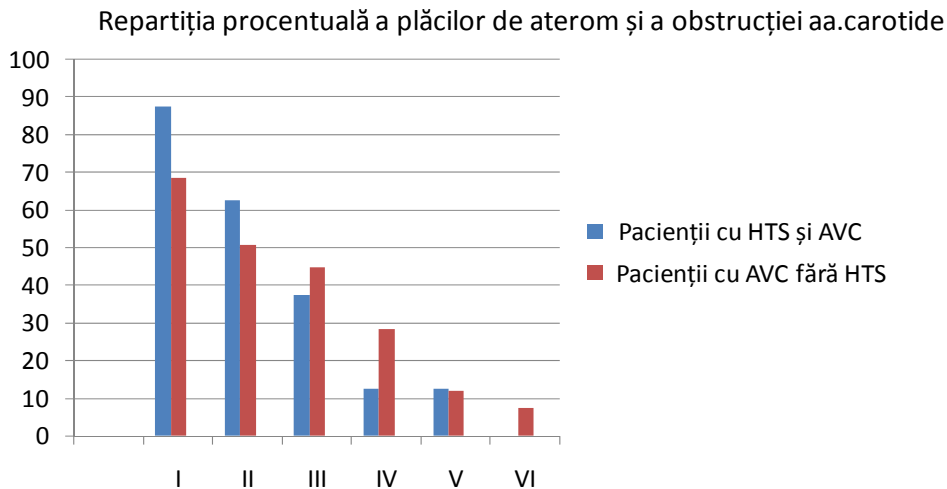
The degree of carotid atherosclerosis was evaluated eco-Doppler through the quantification of the atherom plates and through measuring of the arterial stenosis. In order to underline the ATS plates at the carotid level it was used the linear sonda L 10-5, of 7.5- 10 MHz belonging to the ecograph Siemens Acuson CV 70.

The atherosclerosis plates were defined through the following criteria: 1) focal thickening reported to adjacent segments (as it appears as proeminence in the lumen and/ or rough parts located with increasing echogenicity.

2) an area with focal increased thickening (> than 1.3mm) of the intima media layer (158)

In order to discover the carotid plates, an ample bilateral exam was done on the carotid axe accessible to the Doppler exam. The presence of the significant carotid stenosis (> 70%) were considered severe obstruction.

Results and debates



I. Plăci de aterom în bifurcația arterelor carotide comune

II. Plăci de aterom în carotidele interne

III. Stenoză moderată a a. carotide interne stg. sau dr.

IV. Stenoză severă a a. carotide interne stg. sau dr.

V. Obliterarea a carotide interne stg. sau dr.

VI. Fără plăci de aterom în bifurcația carotidelor comune sau arterele carotide interne

The distribution in percentage of the atherom plates and of the carotid obstruction

Patients with HTS and AVC

Patients with AVC without HTS

I. Plates of atherom in the branching of the common carotid arterias

II. The atherom plates in the internal carotids

III. Moderate stenosis left or right internal carotid

IV. Severe stenosis of left or right internal carotid

V. Obliteration of left or right internal carotid

VI. Without atherom plates in the branching of the common carotids or internal carotid artery.

Table number 3.3

The percentage prevalence of the atherom plates for both groups of patients with AVC must be taken into consideration

	Patients with AVC and HoTS N = 8	Patients with AVC Without HoTS N =67
Age (years)	72,62	76,14
Sex (M/W)	3/5	42/25
Atherom plates in the branching of the common carotid arterias	7 (87,50%)	46 (68,65%)
Atherom plates in the internal carotids	5 (62,50)	34 (50,74%)
Moderate Stenosis a a. Internal carotid left or right.	3 (37,50)	30 (44,77)
Severe Stenosis a. Internal carotid interne left or right	1 (12,50)	19 (28,35)
Obliteration of the internal carotid left or right	1 (12,50)	8 (11,9%)
Without atherom plates in the branching of the common carotidsscarotids or internal carotid arterias	0 (0%)	5 (7,46)

The research concluded an association between the thyroid hypo-function and the higher presence of the atheroma plates at the level of carotid branching compared to the patients with AVC without under clinic thyroid insufficiency. This fact in my opinion suggests the role of the under clinic hypothyroidism as risk factor in atherosclerosis and AVC and the patients with deposits of carotid athromatous plates , especially at the level of the carotid crossing, must be taken into consideration for more detailed carotid evaluations, in order to exclude the under clinic hypothyroidism.

Conclusions

1. The present research demonstrates an association between the thyroid hypo-function and the increased presence of the atheroma plates at the level of the carotid branching compared with the patients with AVC without under clinic thyroid insufficiency .This fact can suggest the role of HoTS as factor for atherosclerosis and AVC.
2. “The early vascular aging” –EVA reflects the early evolution of the process of the atherosclerosis, especially at the patients who associate multiple factors of risk, as under clinic hypothyroidism.
3. The presence of the atheroma plates contribute to a better stratification of the vascular effect risk.
4. In percentage, the moderate obstruction of the internal carotids was superior at the patients with AVC and HoTS reported to the patients suffering of AVC without HoTS.
5. The patients with deposits of carotid atheromatous plates , especially at the level of the carotid branching, must be taken into account for more detailed evaluations, in order to exclude the under clinic hypothyroidism.
6. The evaluation of the systemic atherosclerosis through non-invasive methods as Doppler ecography carotid test has an important role in discovering the patients with high risk to

the prevention methods and the HoTs treatment has as a result the decreasing of morbidity or the cerebral vascular mortality and the increasing of life expectancy.

7. The Doppler echography for carotid has the role of discovering patients with the high risk of developing the vascular cerebral ischemic accident and offers a clue upon the process of atherosclerosis at the level of the entire circular system, there is a higher AVC risk.
8. HTS is associated with a higher frequency of the atheromatous plates and signs of macro-vascular atherosclerosis
9. The lower levels of thyroid hormones cause hyper-cholesterol with high values of LDS-cholesterol. It is important the suspicion of the “masked” hypothyroidism or under clinic at the patients with isolated hyper-cholesterol, especially at the old people. In these cases, at a value of LDS-cholesterol > 4.1mmol/l (>160 mg/dl) TSH will be dosed.

Study number 4.

CORRELATIONS BETWEEN THE FIGURE OF BODY MASS AND THE LEVEL TSH AT THE PATIENTS WITH AVC proposed to research 1) to what extent the obesity associated with under clinic hypothyroidism was a risk factor for AVC and 2) correlations between the level of TSH and IMC at the patients with AVC and under clinic hypothyroidism, versus patients with AVC without under clinic hypothyroidism

Results and Debates

Table number 4.4 M plus/minus DS and BMI at the patients with AVC and HoSC compared to the patients with AVC and NT

Parameters	Patients with AVC and HoTC N=8 TSH: 5,00-10.00 µU/ml FT4: N	Patients with AVC and NT N=15 TSH:0,37-4,94 µU/ml FT4: N	Value <i>p</i>
TSH µU/ml M±DS	7.27±2.11	1.44±0.22	P=NS
BMI(kg/m ²) M±DS	27.94±3.61	27,12±4,20	P=NS

The study concluded that 62.5% from the patients with AVC and HoTS had IMC over 30 (obesity first degree), versus 9,3 patients with AVC without our study concluded that 62.5% from the patients with AVC and HoTS had IMC over 30 (obesity first degree), versus 9,3 patients with AVC without under clinic hypothyroidism. The values TSH have been significantly increased (p o.o5) at the patients with AVC and under clinic hypothyroidism (7.27 plus/minus 2,11), compared with the TSH values (1.44 plus/minus 0.22) patients with AVC without under clinic hypothyroidism.

The overweight and obesity are risk factors associated to patients with under clinic hypothyroidism. As a consequence all patients with AVC risk must be investigated for thyroid insufficiency, and the investigation of the thyroid to be considered inner part in the stratification of AVC risk

Conclusions

1. It was compared the value of IMC at three groups of patients with age between 65 and 80 years old: 1) patients with AVC and HoSC; 2) patients with AVC and NT; 3) patients without AVC with NT
2. Our study concludes that 62,5% from the patients with AVC and HoTS had IMC over 30 (obesity first degree), versus 9,3% patients with AVC without HoSC and 20 % patients without AVC and NT
3. Overweight was equal at the three groups of patients, being in average of 40%.
4. IMC was in normal limits only to 25% from the patients with AVC and HoTS, at 40 % at the groups of patients with AVC and patients without AVC with NT
5. Between the values BMI for the two groups 1) patients with AVC and HoSC (27.94 plus/minus 3.61) 2) patients with AVC (27,12 plus/minus 4.20 and NT; there were no differences statistically significant
6. The TSH values were significantly high (p 0.05) to the patients with AVC and HoSC (7.27 plus/minus 2.11), compared to the values TSH (1.44 plus/minus 0.22) patients with AVC without HoSC
7. Moderate increasing of seric TSH with normal levels if FT4 is associated with an higher incidence of overweight and obesity
8. Our research allows to assert that the surplus of weight and obesity are risk factors at the patients with HoSC. As a consequence, all patients with AVC risk should be investigated for thyroid insufficiency and the investigation of the thyroid should be considered inner part in the stratification of the AVC risk.

Study number 5.

The reactive proteine C, marker of chronicle inflammation, favoring factor for AVC at the patients with under clinic hypothyroidism investigated the presence of the chronicle inflammation through the measurement of the seric concentration of PCR as atherogenetic factor at patients suffering of under clinic hypothyroidism and AVC, versus patients with AVC normal thyroid.

Results and Debates

Table number 5.3 PCR to the patients with AVC + HoSC and AVC + NT

	AVC + HoSC	AVC + NT	P	<i>p</i>
PCR (M±DS)	3,62±2.44	1,73±2,12	<0.00035	<0.05

The results confirmed the fact that PCR is with high values at the patients with under clinic hypothyroidism who suffered a cerebral accident. The average value of PCR was really high at the patients with under clinic hypothyroidism and AVC (3,62 plus/minus 2.44 mg/dl) reported to

the patients with AVC without HoTS (1.73 plus/minus mg/dl) the difference was statistically significant. ($p=0.05$)

The dosing of the reactive protein C would be a good indicator of under clinic hypothyroidism. PCR with high values at the patients with under clinic hypothyroidism demonstrates the more important role of the inflammation in aggravation ATS and AVC risk. Dosing PCR to the patients with under clinic hypothyroidism allows a better supervision of the AVC risk to these.

Conclusions

1. The reactive C protein is one of the most studied markers of inflammation, being a powerful predictor and an independent one for AVC. The aim of the research was the investigation of the presence of chronic inflammation through measuring the seric concentration of PCR as atherogenic factor at the patients suffering of under clinic hypothyroidism (HoTS and AVC, versus patients with AVC without HoTS)
2. Our results concluded that PCR is with high values at the patients with HoTS who suffered a cerebral accident. The average value of PCR was really high at the patients with HoTS and AVC (3,62 plus/minus 2,44 mg/dl) reported to the patients with AVC without HoTS (1,73 plus/minus 2,12 mg/dl); the difference was statistically significant ($p=0.05$)
3. The dosing of the reactive C protein would be a good indicator of under clinic hypothyroidism. PCR with high values at the patients with HoTS show the more important role of the inflammation in the aggravation of ATS and the AVC risk.
4. The dosing of PCR at the patients with HoTS allows a better supervision of the AVC risk to those.

GENERAL CONCLUSIONS

1. The manifest clinic hypothyroidism (HoCM), defined through values over the superior limit of TSH and with values under the normal limits of FT3 and FT4, associated with signs and clinical symptoms, is one of the most frequent affections which the practitioner doctor faces.
2. The under clinic hypothyroidism (HoTS), characterizes the situation in which TSH has increased values, with normal values of the triiodothyronine (FT3) and of free tiroxine (FT4). HoTS at the adult people, has a prevalence till 10%.
3. The normal TSH value at the patients with under clinic hypothyroid is situated between 0.05-4.50 mU/L. So, the diagnosis of the under clinic hypothyroidism is a laboratory one. The clinical consequences linked of under clinic hypothyroidism remain a controversial subject, from where there is the necessity of treatment.
4. The last years research 1—15 years (21), refer to the association between the under clinic hypothyroidism and the heart ischemic and cerebral diseases. The risk of ischemic cerebral diseases is correlated to hyper cholesterol, the discreet chronic inflammation which, together with other factors modifies the coagulation parameters.
5. The early diagnosis of HoTS at the patients with AVC risk is the theme approached in the present work. The theme of this thesis hasn't been studied at the national level, and at the international level exist a few studies, many times with contradictory results.
6. In the present thesis we proposed a) to evaluate the association between the under clinic hypothyroidism and the cerebral ischemic disease at the patients suffering of under clinic

- hypothyroidism, who suffered cerebral vascular accidents, as well as there is a specific modality of manifest of the cerebral vascular accident at the patients with under clinic hypothyroidism; b) to study the implication hypothyroidism as risk factor for the cerebral vascular and the prophylaxy and the treatment; c) the evaluation of the aggravation of other risk factors for AVC (dyslipaemia, high blood pressure, the figure for the body mass, the coronary atherosclerosis, pro-inflammatory factors.
7. The study contained 154 patients who suffered an AVC, hospitalized in the Clinic of Neurology Asklepidos from Schidaual, Germany between 2013 - 2015 with the ages between 55 and 90. After the application of the including and excluding criteria there remained in study 116 patients, from which 72 were men and 44 were women.
 8. The including criteria were based on the diagnosis of cerebral vascular accident demonstrated clinically and para clinically, excluding the patients who followed a treatment with amiodarone, the previous diagnosis hypothyroidism or hyperthyroidism, with severe obesity, chronic cardiac insufficiency, severe systemic diseases and chronic renal and hepatitis, malignant tumors, patients without thyroid hormonal doses .
 9. The patients taken in the study the AVC diagnosis was established according to the clinic guides through clinic exam and paraclinic investigations. The para clinic exams included IRM (difussion sequences and FLAIR, T1, T2) or CT, Angio RMN or Angio CT used for the intracerebral vascular exploration. Also, the Doppler echography was used for the extra cerebral vascular exploration.
 10. To all the patients were given the thyroid function evaluation as part of routine evaluation for cerebral vascular events. The hormonal dosing was made from veins' blood after at least 8 hours of fast, after a night in hospital for AVC. The test was made immediately after the blood test. For the dosing of TSH and FT4 were used the immunological method through CMIA (Chemiluminiscent Microparticle Immunoassay) with the Architect device 4100 if the company Abbot Diagnostic, GmbH.
 11. The under clinic hypothyroidism was defined as TSH > 4,94uU/ml and TSH < 10uU/ml and FT4 with normal values : 0,7-1,48ng/dl
 12. In our research, TSH has superior values (7.27 plus/minus2.1uU/ml), statistically significant (p 0.05) at the patients with HoSC and AVC compared to the patients with AVC without HoTS (2,38 plus/minus 1,6uU/ml)
 13. After the evaluation of the thyroid function were found:
 - 95 patients with AVC without under clinic Thyroid malfunctions
 - 8 patients with under clinic hypothyroidism not diagnosed before AVC
 - 13 patients with under clinic hyperthyroidism not diagnosed before AVC
 14. All patients with under clinic hypothyroidism were included (Likelihood Ratio) in the age group 61-80. The incidence of the under clinic hypothyroidism was 10,7 % if we report only to the ones of 67 patients with AVC included between 61 and 80, age group in which there are 8 patients with HoTS
 15. HoTS was more frequent at the feminine sex: 62,5%
 16. The vascular cerebral accident happened with 5 years earlier at the patients with HoSC. The normal thyroid patients with AVC were 76,14 plus/minus 9,72 years old compared to the patients with high TSH and normal FT4, the average age of those being 72,62 plus/minus7,12
 17. At the patients with HoSC the cerebral infarct was present 75% from the cases, the most frequent location being at the level of left cerebral artery.
 18. Dyslipaemia is one of the most frequent complications of the hypothyroidism. If atherosclerosis is a well known complication of mixdema with severe causes upon the

artery system, the risk of atherosclerosis correlated with the under clinic hypothyroidism, is now asserted or on the contrary denied.

19. In our research the level of the total seric cholesterol was higher (202,12 plus/minus 47,55mg/dl) at the patients with under clinic hypothyroidism reported to the ones with AVC normal thyroid (166,06 plus/minus 74,71mg/dl, but the difference is not statistically significant (p o.05)
20. The LDL-Co level was also higher in the case of the patients with AVC and hypothyroidism (124,25 plus/minus mg/dl) compared to the patients with AVC without under clinic hypothyroidism (117,8 plus/minus 31,88 mg/dl); the difference was not statistically significant (p o.05)
21. TG were higher (177,67 plus/minus 130,33mg/dl) at the patients with normal thyroid with AVC compared to the ones with under clinic hypothyroidism (135,38 plus/minus 73,64 mg/dl), but the difference was not statistically significant
22. The explanation that the lipidic parameters close to the values considered normal might be the fact that most of the patients with AVC, with or without HoTS were before their cerebral accident under lipid lowering medication.
23. The actual research results sustain the existence of a correlation between the under clinic hypothyroidism and the atherosclerosis modifications of the lipidic profile. An association was noticed between the increasing of the level of TSH and the atherogenic lipid profile (the increasing of the Cholesterol level and LDL-Col)
24. It remains to be established if HoTS is a risk factor for AVC through its favoring effect of the atherosclerosis (hyper-cholesterol, the increasing LDL-Col) or has a per se effect, independent.
25. Our research confirmed the fact that under clinic hypothyroidism might increase the risk of diastolic arterial high blood pressure.
26. TAs had smaller values (M plus/minus DS 133,75 plus/minus 14,33) at the patients with AVS and HoTS, compared to the patients suffering of AVC but without HoTS (M plus/minus DS: 145,33 plus/minus 18,27. The difference between the two groups was statistically insignificant p=0.05, but it was statistically significant at p = 0,01
27. Tad, this was higher to the patients with AVC and HoTS (87,5 plus/minus 9,26) compared with the patients without HTS (85,67 plus/minus 11,63) although from the statistic point of view, Tad differences were insignificant. The same thing can be asserted about Tam
28. The biggest differences (p=0.05), in our research were noticed for the values TAdf. TA differentiated or the pressure of the pulse is given by the difference between systolic TA and diastolic TA
29. The values significantly higher of PP, may be considered as an indicator of arterial rigidity in under clinic hypothyroidism
30. The physio-pathologic explanation of TA at the patients with HoTS can be explained through bradycardia, the tightening of the vessels and the peripheral vascular resistance present in the deficit of thyroid hormones. Tadf depends on the velocity of the pulse wave which is the golden standard of the arterial rigidity.
31. The high blood pressure patient, early diagnosed with under clinic hypothyroidism and treated with thyroid substitution might avoid the anti high blood pressure treatment. The administration of the thyroid hormones would also reduce the increased level of cholesterol and so the risk of cerebral vascular effect.
32. The screening of the hypothyroidism is essential if the patient has a higher level of the cholesterol, overweight and increased PP. The early diagnosis and the treatment of thyroid substitution applied in due time, might cause the reduction of the cardio vascular risk.

33. The present research shows an association between the thyroid hypo-function and the increased presence of the atherom plates at the level of the carotid branching (87,5%) compared with the patients with AVC without under clinic Thyroid insufficiency (68,6%). This fact may suggest the role of HoTS as risk factor for atherosclerosis and AVC
34. EVA (The Early Vascular Aging) reflects the early evolution of the process of atherosclerosis, especially at the patients who associate multiple factors of risk, as under clinic hypothyroidism.
35. The presence of the atherom plates to a better stratification of the risk of vascular effect.
36. In percentages the moderate obstruction of the internal carotids was superior at the patients with AVC and HoTS reported to the patients suffering of AVC without HoTs
37. Patients with deposits of carotid , **atheromatous** plates especially at the level of the carotid branching , must be considered for the more detailed evaluations, in order to exclude the under clinic hypothyroidism.
38. The evaluation of the systemic atherosclerosis process through non invasive methods as carotid echography Doppler has the role to detect patients with higher risk to whom the application of the preventive measures and the HoTS treatment has as result the decreasing of the morbidity or cerebral vascular mortality and increased life expectancy.
39. The carotid Doppler echography has the role to detect patients with high risk to develop the cerebral vascular ischemic accident and offers a hint upon the process of atherosclerosis at the level of the entire circulator system, the fact which might cause an increased AVC risk.
40. HoTS is associated with a higher frequency of the carotid atherom plates and with signs of macro vascular atherosclerosis.
41. Our study conclude that 62,5 % from the patients with AVC and HoTS had IMC over 30 (obesity degree 1) versus 9,3 % patients with AVC without HoSC and 20 % patients without AVC and NT
42. Between the values BMI with AVC and HoSC (27,94 +/- 3,61) and the patients with AVC (27,12 +/-4,20), NT there were no significant differences(p=NS).
43. Moderate increased values of the TSH with normal levels of the FT4 are associated with a higher incidence of overweight and obesity. The Values of the TSH were significantly increased (p=0.05) at the patients with AVC and HoSC (7,27+/-2,11) compared to the values TSH (1,44+/-0,22) patients with AVC without HoSC
44. Our research allows to assert that the overweight and obesity are risk factors at patients with HoSC. As a consequence, all patients with AVC risk should be investigated for thyroid insufficiency and the investigation of the thyroid should be considered as inner part in the stratification of the AVC risk
45. The reactive C protein is one of the most studied markers of inflammation, being a good and an independent predictor for AVC. The aim of the research was the investigation of the chronicle inflammation through measuring the concentration of PCR as atherogenetic factor at the patients suffering of under clinic hypothyroidism (HoTS) and AVC, versus patients with AVC without HoTS
46. Our results concluded that PCR is with increased values at the patients with HoTS who suffered a cerebral accident. The average value of PCR was increased at the patients with HoTS and AVC (3,62+/- 2,44mg/dl) reported with the patients with AVC without HoTS (1,73+/- 2,12 mg/dl); the difference was statistically significant (p 0.05)
47. The dosing of the reactive C protein would be a good indicator of the under clinic hypothyroidism. PCR with increased values at the patients with HoTS show the role of the inflammation in aggravation of ATS and of the risk of AVC.
48. Generally, the evaluation guides of the AVC risk focuss on a series of factors of risk: the artery tension, sanguine lipids, obesity, sedentary state, smoking; in order to elaborate

some therapeutic strategies and prophylactic ones it is important to take into consideration the under clinic hypothyroidism.

THE ORIGINALITY AND THE INNOVATIONS OF THE THESIS

The under clinic hypothyroidism (HoTS) characterizes the situation in which TSH has increased values, with a values of the triiodothyronine (FT3) and of the free tiroxine (FT4). HoTS has a prevalence till 10% at the grown ups.

The research from the last 10-15 years concludes an association between the under clinic hypothyroidism and the cerebral and vascular ischemic diseases. The risk of the cerebral ischemic diseases is correlated with hyper-cholesterol, the discreet chronic inflammation, which, together with other factors modify the coagulation parameters.

In the present thesis we intended:

- a) to evaluate the association between the under clinic hypothyroidism and the cerebral ischemic disease at the patients who suffer of under clinic hypothyroidism, who suffered cerebral vascular accidents, as well as there is a specific modality of manifestation of the cerebral vascular of the patients with under clinic hypothyroidism.
- b) To study the implication hypothyroidism as risk factor for the cerebral vascular accident and the prophylaxis and its treatment
- c) The evaluation of the aggravation of other risk factors for AVC (dyslipemia, high blood pressure, the figure for the body mass, atherosclerosis, pro-inflammatory factors), in the presence of the under clinic hypothyroidism)

Our study demonstrated that the cerebral vascular accident happened at younger ages (five years earlier) at the patients with AVC normal thyroid values.

In our research dyslipaemia was stronger to the patients with under clinic hypothyroidism compared to the patients with AVC normal thyroid values.

We consider that an innovative contribution of the thesis the underlying the modifications ob the different blood pressure (TAdf) at the patients with HoSC.

The research confirmed the fact that under clinic hypothyroidism increases the risk of diastolic arterial blood pressure and also noticed significant values statistically higher of the differentiated TA (the pressure of the pulse), at the patients with HoSC, phenomenon mentioned in the national and international medical literature. The values significantly higher of the PP, may be considered as an indicator of the arterial rigidity in the under clinic hypothyroidism. Tadf depends on the velocity of the pulse wave which represents the golden standard of the arterial rigidity.

The high blood pressure, early diagnosed with under clinic hypothyroidism and treated with thyroid substitution would avoid the anti high blood pressure treatment.. The administration of the thyroid hormones also reduces the high level of cholesterol.

Our results concluded that PCR has statistically significant higher values at the patients with HoTS who suffered a cerebral accident. PCR with high values at the patients with HoTS demonstrate the more significant role of the inflammation in the aggravation of ATS and AVC risk.

Generally, the evaluation guiding books referring to AVC risk focus on a series of risk factors: the blood pressure, sanguine lipids, obesity, sedentary life, smoking; in order to elaborate some efficient therapeutic and prophylactic strategies it is important to take into account the under clinic hypothyroidism.

The importance of this research comprises first in its clinical approach. At the national level it is opening some research ways and at the international level has a completing and innovative role. The study of the risk factors for AVC, among which under clinic hypothyroidism is extremely important from the preventive point of view.