DEPRESSION AND MYOCARDIAL INFARCTION. CLINICAL ASPECTS OF CORONARY DISEASE AS A RESULT OF DEPRESSION AND OF DEPRESSION INCREASED RISK AS A RESULT OF THE CORONARY DISEASE

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Abstract: *Out of all major interference areas of various specialties, atherosclerosis is of special interest for physicians, for cardiologists, but for neurologists and psychiatrists as well. Great deals of vascular diseases are caused by evolution of atherosclerosis and psychiatric conditions are frequently generated and sustained by the vascular atherosclerotic pathology but not only. Our purpose in this paper is to oversee, in relation to the above stated observations, the interference of two major human conditions: depression and myocardial infarction, as well as their interconditioning in medical practice. Just like coronary ischemic disease plays a major role in cardiovascular pathology, depression also plays a very important role in psychiatric affections. Consecutive depression following myocardial infarction has been extensively studied simultaneously with the statements of Fausure and Smith stating the possibility to associate coronary disease and depression. The authors claim that 65% of the patients that suffered a myocardial infarction reported associated depression signs, and that major depression disorder occurs in 15-20% of these cases. Within the last decades an impressive number of epidemiological studies tested the connection between depression and mortality at patients that suffered myocardial infarction. These studies claimed depression played its role as independent risk factor of the coronary disease at persons that initially didn't suffer from this disease. Another research, by Williamsen and Smith, evidences that those depressive persons suffering from a former cardiovascular disease present a fatal myocardial infarction risk 3.5 times higher than non-depressive persons suffering from a cardiac disease. Some physicians believe that depression plays a role in the occurrence of cardiovascular diseases since depressive patients represent 60% of the number of hospitalized cardiac patients. Researches on the relation between infarction and depression report the fact that about one third of the patients committed for myocardial infarction suffered from clinical depression signs 18 months after the coronary accident. There is increasing evidence that depression affects prognosis in the case of patients suffering from coronary artery disease, particularly in the case of patients that suffered an acute coronary accident. These pieces of evidence suggest that depression and coronary artery disease may lead to an increased decease risk irrespective of which of the diseases occurred first. This paper is meant to be a pertinent argument based on clinical and paraclinical scientific findings aimed to lower the increased morbidity and mortality given by the coexistence of the two affections thorough their prophylaxis and early treatment.*

Keywords: *Depression, myocardial infarction*

Rezumat: *Intre zonele de interferenţa majora a diverselor specialitati medicale-ateroscleroza implica un interes fundamental pentru internist, cardiolog, dar si pentru neurolog si psihiatru. O proporţie semnificativa a bolilor vasculare au la baza manifestări evolutive ale aterosclerozei, iar bolile psihiatrice sunt frecvent generate si întreţinute de patologia vasculara aterosclerotica si nu numai. In preocuparea lucrării de fata suntem interesaţi sa urmărim interferenţa sub raportul observaţiilor de mai sus a doua mari suferinţe umane: depresia si infarctul de miocard, precum si interconditionarea lor in practica medicala. Aşa precum boala ischemica coronariana ocupa un loc primordial in patologia cardiovasculara, si in cadrul bolilor afective depresia ocupa locul de frunte intre afecţiunile psihiatrice. Depresia consecutiva infarctul de miocard a fost mult studiata odată cu afirmaţiile lui Fausure si Smith care susţin posibila asociere a prognosticului bolii coronariene cu depresia. Autorii susţin ca 65% dintre pacienţii care au suferit un infarct miocardic au raportat prezenta simptomelor depresive asociate, iar depresia majora este prezenta la 15-20% dintre aceştia. In ultimele decenii un impresionant număr de studii epidemiologice au probat relaţia dintre depresie si mortalitatea pacienţilor cu infarct miocardic. Aceste studii au susţinut contribuţia depresiei ca un factor de risc independent al bolii coronariene la persoanele care nu sufereau iniţial de aceasta boala. O alta cercetare in care Williamsen si Smith au studiat persoanele cu depresie si care au suferit de o boala cardiovasculara anterioara, au de 3,5 ori un risc mai mare de deces prin infarct miocardic, decât pacienţii cu boala cardiaca care nu suferă de depresie. Unii clinicieni considera bolile cardiovasculare ca fiind legate cauzal de depresie, a căror incidenţa depăşeşte*

60% din numărul pacienţilor cardiaci spitalizaţi. Studiile care s-au ocupat de relaţia infarct-depresie raportează faptul ca aproximativ o treime din bolnavii internaţi cu infarct miocardic, după 18 luni de la accidentul coronarian prezentau depresie clinica. Dovezile conform cărora depresia afectează prognosticul la pacienţii cu boala arterial coronariana ,in special la cei care au suferit un accident coronarian acut, sunt in creştere Aceste dovezi sugerează ca depresia si boala arteriala coronariana ar putea duce la un risc sporit de deces indiferent de boala care a apărut prima. Lucrarea de fata se doreşte a fi un argument pertinent bazat pe observaţii ştiinţifice clinice si paraclinice ,in vederea scăderii morbidităţii si mortalităţii crescute date de coexistenta celor doua afecţiuni prin profilaxia si tratamentul precoce al acestora.

Cuvinte cheie: *Depresia, infarctul de miocard*

INTRODUCTION

Out of all major interference areas of various specialties atherosclerosis is of special interest for physicians, for cardiologists, but for neurologists and psychiatrists as well.

Great deals of vascular diseases are caused by an evolution of atherosclerosis and psychiatric conditions are frequently generated and sustained by the vascular atherosclerotic pathology but not only.

Our purpose in this paper is to oversee, in relation to the above stated observations, the interference of two major human conditions: depression and myocardial infarction as well as their interconditioning in medical practice. Just like coronary ischemic disease plays a major role in cardiovascular pathology, depression also plays a very important role in psychiatric conditions.

The two affections' overinvestment was conditioned by a series of objective factors like industrial increase and, simultaneously, increase of urban crowding and enhancement of anti-social elements causing behavioral alterations from eating habits to civic attitude. These elements joined other risk factors both for obstructive coronary disease as well as for depression.

Together with vascular atherosclerosis – representing 85% of the causes of myocardial infarction – a series of risk factors can be the cause, the sign or the risk marker for ischemic cardiopathy. The "causing" effect can be evidenced by the increase of the risk to fall sick due to the increase of the risk factor, previous affection, a specialty degree of the factor of the disease as well as the fact that factor removal favourably alters the disease.

In the classification of the risk factors by the extent of influence on the evolution of ischemic cardiopathy (Fuster and Pearson), at class III are listed "psychosocial" factors, alterable factors that can lower the cardiovascular disease risk. Psychosocial factors become risk factors by behavioural alteration such as mania, hostility, depression, anxiety, as well as type A behaviour, stress, poverty, job uncertainty, and unemployment. Persons with type A personality have pectoral angina two times more frequently: anxiety and depression make up a psychoanalytic profile that favors the occurrence of the coronary disease, chronic stress tending to spasms and coronary vascular accidents: negative emotions play an unfavorable role on coronary circulation and myocardial electrical stability.

The Framingham study evidenced that cardiovascular risk at type A personality is an "independent" one causing and increasing interest in its monitoring since sympathic activity is higher when correlated with cardiac frequency and arterial tension, it increases plaque aggregation, and endothelial dysfunction and coronary vasoconstriction occur – Weissman, Myers and Helgason estimate that, clinically speaking, depression affects 15% of the persons of any populations, representing thus "a major source of human anguish". It occurs at patients suffering from chronic pains and it frequently evolves after the occurrence of other medical conditions such as heart attack, malign diseases, osteogenesis, cardiac insufficiency, end-stage renal diseases etc.

Consecutive depression following myocardial infarction has been extensively studied simultaneously with the statements of Fausure and Smith stating the possibility to associate coronary disease and depression.

The authors claim that 65% of the patients that suffered a myocardial infarction reported associated depression signs, and that major depression disorder occurs in 15-20% of these cases.

Within the last decades an impressive number of epidemiological studies tested the connection between depression and mortality at patients that suffered myocardial infarction. These studies claimed depression played its role as independent risk factor of the coronary disease at persons that initially didn't suffer from this disease. Another research, by Williamsen and Smith, evidences that those depressive persons suffering from a former cardiovascular disease present a fatal myocardial infarction risk 3.5 times higher than non-depressive persons suffering from a cardiac disease. Depressive disorder, according to standard research criteria, appears at 13-19% of the patients the moment infarction occurs. This disorder plays an important role for myocardial infarction patients due to the fact that depression associates with evolution aspects such as mortality increase, angina crises, arrhythmias, increase of admission cases and extended disability. Association of depression with mortality increase in case of myocardial infarction is also caused by increased myocardial vulnerability when dealing with arrhythmias due to the fact that depression increases sympathic vegetative tonus, a fact also confirmed by a recent study; this study highlights the fact that:

- mortality at depressive patients increased in the case of patients presenting premature ventricular extrasystoles, more than 10 per hour.
- emotional distress is associated with increased mortality at patients suffering from "non q" wave myocardial infarction

- depressive cardiac patients have increased cardiac frequency and low heart rhythm variability.

Several studies revealed that where psychosocial interventions were accepted by patients suffering from myocardial infarction associated with depression mortality dropped with 40%, maybe due to the benefic effects on their mood as well. There is evidence according to which patients suffering from severe cardiac disease (myocardial infarction) are exposed to the highest negative evolution risk due to depression because both the physician and the patients focus mainly on the cardiac disease and its treatment, leaving depression to manifest itself, but depression evolves and causes a general distress.

Some physicians believe that depression plays a role in the occurrence of cardiovascular diseases since depressive patients represent 60% of the number of committed cardiac patients.

Researches studying the relation between infarction and depression report the fact that about one third of the patients committed for myocardial infarction suffered from clinical depression signs 18 months after the coronary accident.

Various emotions, although aware, directly reverberate on the cardiovascular system causing intense functional and transitory alterations (tachycardia, blood pressure increase, arteriolar vasoconstriction or vasodilatation, etc).

At the same time the alterations of the heart functioning are anxiously perceived and assumed in a hypochondriac way, usually accounting for physical exams (Duret-Cosyns).

Nature and the role of the psychic and socio-cultural factors affecting the health and making thus possible the transposition of the psychic and social responses in the somatic phenomenon (symptom, syndrome, and disease) is the object of psychosomatic medicine. Psychosomatic medicine approaches functional or organic affections in whose etiology, pathogeny, clinical manifestation, evolution and prognosis the psychic factors play an important role.

Psychosomatic medicine reformed traditional concepts regarding the etiology, the pathogeny and the therapy of the somatic diseases, gave up its dualist standing regarding the psychic and the somatic, the psychogenic and somatogen for a monist, interactive and integralist position approaching the disease psychosomatically as a bio-psychological process that plays a role as a bio-socio-cultural unit (Grinker and Engel).

This paper is actually an opportunity to render valuable part of the theoretical base of the psychosomatic medicine on the account of which depression is pathologically involved in myocardial infarction, an opportunity to render the interconditioning between the two affections, as well as their evolution and prognosis.

The study method has two components:

- Depression as risk factor in the coronary artery disease (CAD) evolution and progression
- Depression evaluation after myocardial infarction

a. The study group consists of 30-50 subjects with or without major depression according to DSM IV TR 9 (Diagnostic and Statistical Manual of Mental Disorders-USA) and ICD 10 (International Statistics Classification of Diseases and Related Health Problems-Europe), presenting instead depressive symptomathology on account of:

- Eligibility criteria:
  - study age 20-80
  - gender: both
  - social background: rural and urban
  - education background: secondary, high school, university
- Exclusion criteria:
  - Pregnancy
  - confirmed sugar diabetes
  - body mass index < 20Kg/mp and >30Kg/mp
  - suffering from cardiovascular disease or other end stage organic disease
  - suffering from peripheral vascular disease
  - HIV infection
  - patients under beta-blocking, tiazidics or glucocorticoids treatment
  - subjects that use oral contraceptives

Study duration is 12 months. With account on:

- depression start date
- coronary disease start date
- family history

As depression evaluation instrument Hamilton and Beck scales are used; they have the following components and degrees according to the symptomathology intensity from 0 to 4 (21 items):

1. depressive mood (melancholy, despair, isolation, uselessness) 0-4
2. guilty feeling 0-4
3. suicide 0-4
4. early-night insomnia 0-2
5. middle-of-the-night insomnia 0-2
6. late-night insomnia 0-2
7. work and activity 0-4
8. inhibition (slow ideation and language) 0-4
9. nervousness 0-2
10. psychic anxiety 0-4
11. somatic anxiety 0-4
12. gastrointestinal somatic symptoms 0-2
13. general somatic symptoms 0-2
14. genital symptoms 0-3
15. hypochondria 0-4
16. weight loss
    - after anamnesis (before treatment) 0-2
    - after psychiatric exam
17. self-criticism 0-2
18. daily variation 0-2
19. depersonalization and derealization 0-3
20. paranoia symptoms 0-4
21. obsessive – impulsive symptoms 0-2

Depression diagnostic must be evidenced on account of these criteria and the type of depression must

be depicted according to the scoring of each item. The accuracy of the diagnostic, on account of the above mentioned standards, allows us to proceed further.

The biomoral exams are performed in two steps, after the psychiatric diagnosis. The former step at the beginning of the study and the latter at the end of the study, consisting of:

- cortisolemia
- preprandial glycemia plus a glycemic profile
- cholesterol: - LDL; HDL
- number of thrombocytes
- C – reactive protein
- Fibrinogen
- creatinphosphokinase and MB fraction, LDH (lactate dehydrogenase)
- TGO

Imagistic exams:

- 12 channel EKG (two minimum tracks at the beginning and at the end of the study)
- ECO cardiac –FEVS (VS ejection fraction) with two exams at the beginning and at the end of the study

b. The study group consists of 30-50 subjects with diagnosed myocardial infarction, same eligibility and exclusion criteria.

With regard of cardiac affection we monitor:

- EKG image (12 channels)
  - at start
  - at 7-10 days
  - at 1 months
  - at 3 months
  - at 6 months
  - at 12 months
- enzymatic alterations:
  - total Ck (over 150mU /ml for 2-4 days)
  - CK-MB(over 6-10 % out of total CK)
  - LDH-for late diagnosis
  - HBDH (LDH/HBDH ratio =1,3)
  - TGO
  - Glycemia
  - cholesterol-HDL,LDL; C-reactive protein (test at the beginning and at the end of the study)

Depression is evaluated at the beginning of the study and then at 3,6,12 months, evaluation instrument is Hamilton and Beck depression evaluation scale (BDI).

Each of the 21 items representing the depressive symptomathology are assessed and rated on account of their intensity or depression perception.

The outcome is accurately inventoried, statistically classified and presented in the form of graphics and tables in order to make a material database so that the results can be read.

Minute monitoring of the two sets of patients by clinical and paraclinical exams can offer reasoned scientific conclusions that can evidence the strong interdependence and interconditioning between depression and myocardial infarction.

In the Cardiovascular Health Study, that monitored 5201 subjects for 6 years, high levels of depression symptoms played the role of independent mortality risk factors at adult subjects. The authors considered that the lack of motivation that is consequent to the vital exhaustion and low emotional vitality could be a subsurface mechanism of the depression effect towards mortality.

There is increasing evidence that depression affects prognosis in the case of patients suffering from coronary artery disease, particularly in the case of patients that suffered an acute coronary accident. Moreover, beside mortality risk associated with post myocardial infarction depression, additional health care costs have been reported for readmission and for ambulatory monitoring of the depressive patients that made it through the first year after myocardial infarction.

Please note that major depression is not the only one responsible for unfavourable results. Various exams performed on patients that had previously suffered from myocardial infarction proved that depressive symptoms, anxiety and a major depression history each played a very important role in the results.

These pieces of evidence suggest that depression and coronary artery disease may lead to an increased decease risk irrespective of which of the diseases occurred first.

This paper is meant to be a pertinent argument based on clinical and paraclinical scientific findings aimed to lower the increased morbidity and mortality given by the coexistence of the two affections thorough their prophylaxis and early treatment.

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