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Essential Arterial Hypertension – Psycho-social Features

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Abstract

Essential Arterial Hypertension (EAHT) is one of the most spread cardiovascular diseases. EAHT is considered to be a mostly psychosomatic disease, which can affect the psycho-social functioning (depression, anxiety) as well as the neuro-cognitive one (attention, memory and executive function disorders). These could lead to the negative influence of the patient and important family members' level of quality of life. The psycho-social factors (type A behaviour pattern, negative close relationships, social pressure etc.) can also influence adherence to treatment and the control of arterial hypertension.

Keywords:

essential arterial hypertension, depression, anxiety, psycho-educational rehabilitation program, adherence to treatment

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Introduction

EAHT is a disease which requires a great number of psychological and behavioural adjustments and that is why the psycho-social factors are extremely important for almost all the aspects that are related to the management of the disease.

EAHT can affect the psycho-social functioning as well as the neuro-cognitive functioning of the individual, which leads to the affectation of the quality of life of the patient and important member of the family. The psycho-social factors can also influence the compliance to treatment and the control of the arterial tension.

EAHT is considered to be a *mostly* psychosomatic disease, like, on the other hand, other cardiovascular illnesses (paroxistic tachycardia, arterial hypertension, and ischemic cardiopathy).

Shen et al. (2008) pointed out the fact that the interest for the psychosocial factors regarding the cardiovascular diseases is not new: in the 70's one of the most frequent psychosomatic topics was personality type A, then the hostility has represented the central theme in the 80's, and depression has been recognised as a cardiovascular risk factor in the last 15 years. The most recent research papers in the field develop nowadays, the role of the anxiety as a psycho-social independent risk factor for the cardiovascular disease. There is also the less studied is the additive and synergistic relationship which exists between these psycho-social factors in order to get to know the real magnitude of the impact of their cardiovascular risk.

The research has pointed out the involvement of type A behaviour pattern (TABP) in the trigger of EAHT or other types of illnesses (gastric and duodenal ulcer, coronary ischemic cardiopathy, paroxistic tachycardies, arteriosclerosis and existence of Raynaud disease). TABS is present in subjects with different types of personalities (psychoasthenic, hysterical, paranoid), which have in common some similar behavioural traits (towards the finalizing of a duty, often of profession kind) and relation to people around them.

The subjects with characteristic traits for this behavioural type present twice more frequently coronary cardiopathy than those with type B. Moreover, type A, in comparison with type B, seems to be also related to a tendency to grow more rapidly and impressive of the secretion of catecholamine (stimulating effect of the sympathetic nervous system) or

of the seric levels of fat acids and cholesterol when a professional stress is present.

EAHT and mental health

Adaptation problems to the diagnosis of EAHT

Studies have demonstrated the existence of some adaptation problems to the diagnosis of EAHT, which are part of the general stages described in the emotional response to trauma theory (Kübler-Ross, 1976), but which also represents specific aspects related to the negative impact of the condition of patient with cardiovascular disease (somatic-psychological perspective).

The patients affected by cardiovascular diseases with a chronic evolution are often called ‘heart sufferers’. Under this label, unavoidably, patients acquire a different social status related to the necessity of their protection from a number of stress factors. This situation implies a number of restrictions, especially sports related (sometimes with the limitation of the sexual activity), but also from a number of activities with important anti stress effects (trips, sports). We can also add as well the emotional effect determined by the changes in lifestyle (prohibition from smoking, drinking alcohol and coffee, low salt diet) etc.

To these all sources of psychological stress there can be added, usually unconfessed, the possibilities of sudden death (especially those with infarct antecedents) or other serious complications (cerebral vascular accidents which generated paresis and paralysis, pulmonary edema, etc.). The most stressful are the real situations of some patients who underwent operations (prosthetic valves), to which, besides the operation risk, adds the extra fear maintained by the possibility to meet technical faults to medical devices. Moreover, the threat of infarct or its complications recurrence and especially their presence, create a permanent fear state, expression of a daily psychological stress of various intensity degrees, with a negative role in the evolution of the illness itself. This limits to a great deal the initiatives of the patient, being necessary a social re-inclusion led by an experimented psychologist, in a strong collaboration with the cardiologist or internist.

In the same way, the hypertensive patient who, based on the subjective feelings which accompany the tension rise and the appearance of a hypertensive attack, it sometimes increases its severity by the psychological stress in which enters at the same time with the

complications threat (of course, besides feeling the somatic discomfort related to that attack).

Iamandescu (2002) states that cardiovascular disorders have a great influence at cerebral level, on the neuro-psychological level (anxiety and/or depression), as well as psychological level, the patient developing a certain subjective perspective over the dysfunctions determined by EAHT, but also a personal emotional state related to the illness (aspects which are included in the field of quality of life).

EAHT depression and anxiety

A number of research papers have focused on the attention upon the association between *depression* and cardiovascular diseases, but the relationship between AT and depression has been extremely little studied, against the fact that interaction between AT and psychological disorders has been reported. Light (1987) observed that when he talked with his hypertensive patients about their health problems and about the way in which the illness negatively affects their life, these developed high tension values, which maintained themselves over 20 and 40 minutes. However, it is well known the fact that AT rises at the time when the doctor measures the arterial tension of the patient, most probably due to 'robe anxiety' (Grassi, Esler, 1999).

Due to the fact that EAHT as well as depression have a high prevalence, it is extremely important to understand as well as possible the relationship between the two medical conditions.

Scalco, Serro-Azul, Giorgi, Almeida and Wajngarten (2003) has done a synthesis of the most important research found on MedLine regarding the relationship between depression and AHT, reaching to some conclusions which will be mentioned here:

- Regarding the *prevalence of hypertension in depressive patients*, there has been reported a high prevalence of AHT for these patients (Adamis, Ball, 2000). The authors have studied the co-morbidity of psychological disorders and somatic illnesses for a group of 75 depressive old patients who were hospitalized and they have noticed that the depressive patients present a significantly bigger number of cardiovascular diseases and EAHT than patients with other psychological pathologies (Adamis, Ball, 2000).
- Additionally, it has been noticed a *high prevalence of depression in hypertensive patients*. Rabkin, Charles and Kass (1983) has pointed

out a decrease of prevalence of depression in patients compliant with the antihypertensive medication treatment. Moreover, depression has been also associated with an irregular circadian rhythm. The depression symptoms have been associated with a bigger day/night rapport of SAT (n=126 patients without psychiatric symptomatology and without treatment). This result could be at the level of the autonomous nervous system explained by dysfunctions and by (neuro) hormonal disorders (Kario et al., 2001).

Pilgram and Crawford (1993) have not obtained significant differences between arterial tension (AT) of depressive and non depressive patients (n=1046) and the CARDIA (1996) transversal study which evaluated the relationship among symptoms of depression, anxiety, alcohol drinking and AT on a group of 4352 adults, did not reported any relationship between depression and anxiety and AT (Jones-Webb et al., 1996).

- The physiological mechanisms which could explain the relationship between AHT and depression or anxiety can be related to a number of neurogenous factors such as sympathetic nervous system (Jones-Webb et al., 1996; Townsend et al., 1998). Medical data up to present show the over-activation of the (ortho-)sympathetic nervous system (SNS) is a trait specific to AHT, playing an important role in the disease's pathogenesis. This presents a part of the autonomous nervous system (ANS) which triggers the contraction of the digestive tube, heart, arterial walls and relaxation of circular muscles of the iris and fine muscles of the digestive tube, having two neuro-transmitters: adrenaline and acetylcholine.

In conclusion, the relationship between EAHT and depression is an extremely complex topic. Published research, up to present, has pointed out the high levels of AT, a significantly bigger number of hypertensive attacks, hypotension and faults of the circadian variation in depressive patients. Some explanatory mechanisms of this relationship have been proposed, such as dysfunctions of the autonomous nervous system (sympathetic/parasympathetic) and, more recently, some genetic influences. At the same time, there are studies which did not identify any type of association between AT and depression, or theories which focus

on the lowering of AT in depression and rising of AT in the case of anti depressive treatments (tricyclic) (Light, 1987).

The relevance of this theme is very big because the depressive symptomatology is associated with a poor tension control and with the development of the hypertensive complications. Finally, we must pay special attention to the depressed hypertensive patients, in order to be able to minimize the side effects of the depression treatment.

If the relationship between AHT and depression is still unclear and contrary, the only thing that can be stated with more congruence is the fact that *anxiety is a risk factor for EAHT*. Anxious people experience a continuous stress, thing that determines a number of dysfunctions at the level of the autonomous nervous system. This way, it is activated the 'fight or take flight' response in an exaggerated manner, which determines a rise of the heart rhythm, whilst the parasympathetic trigger is 'rest and digest' response is decreasing, lowering the variation of the heart rhythm, both responses being able to influence AT. In his study Shen et all. (2008) pointed out the fact that a significant correlation has been obtained between the level of general anxiety and the myocardial infarction, a special clinical attention being given to elderly patients with severe anxiety.

Psychosocial risk factors of EAHT

Rozanski, Blumenthal and Kaplan (1999) pointed out the psycho-social risk factors for cardiovascular diseases (EAHT they can be divided into two big categories: the emotional factors (severe depression, anxiety, hostility, anger) and chronic socio-demographical stressors (poor social support, low socio-economic status, professional stress, marital stress and stress related to the health system).

The results which support this idea do not come from the field of research related to the quality of life only, but also from physiopathology studies, thing that should determine a rise of the interest in the risk factors of psychosocial type and from the part of health system.

It is known now the fact that, in a depressive patient an overstimulation of SNS does not appear nor of the hypothalamic-pituitary axis which determines an abnormal secretion of cortisol and a risen heart rhythm, but also endothelial- atheromatous dysfunctions, which determines a great number of abnormal platelet sediments.

Additionally, the depressive patient presents classical dysmetabolic syndrome symptoms, which means a high risk of type 2 diabetes.

INTERHEART Study done by the European Society of Cardiology (Rosengren et al., 2004) has pointed out the fact that the psycho-social index is one of the most powerful predictor of acute myocardial infarction, being part of the same risk category together with the diabetes, and smoking.

De Vogli, Chandola, Kivimaki and Marmot (2007) *number of negative aspects in close relationships*, such as lack of trust or emotional support, could increase the risk for coronary diseases. In other words, the quality of social relations could be a factor for health and wellbeing. There is a sufficient big number of studies which demonstrate the fact that the exposure to unsatisfying close relationships which determine anxiety, insecurity, fear and a low self-esteem, could lead on long term basis to emotional disorders which then determine changes at biophysical and biochemical level. For example, it has been reported the fact that a poor quality of marital relationship present a prognosis factor for myocardial infarction and dysmetabolic syndrome, especially in women. De Vogli, Chandola, Kivimaki and Marmot (2007) studied a group of 901 subjects from which 589 presented the coronary disease. There has been evaluated the quality of social relations, from the closest (80% from the respondents have put on the first place in the hierarchy the marital relationship), to the least important. After selecting the two groups after a number of social-demographic, biological factors (obesity, AHT, diabetes type 2, cholesterol) it has been observed that the people who experience negative aspects in close relationships have presented a risk with 34% higher for the coronary disease. The power of this relationship has diminished a little but it remained significant after the influences of the depression variable have been removed. In contradiction with other studies have obtained regarding the fact that women and people with a poor social status are more frequently in the situation of facing the negativity of close relationships, gender and social position did not influence the association significantly. In conclusion, the negative interactions in close relationships produce similar cardiac effects, no matter the gender and social status. This aspect could be a more powerful predictor than the factors of social support regarding health, because it has been observed that individuals tend to re-

experience rather mentally emotional contents with negative connotation, than positive ones.

All these emotional effects trigger neuroendocrine changes, inflammatory and immunological changes, effects that medical field treats without reaching the primary cause. Additionally, *social pressure* contributes to the degradation of the quality of social relations. In conclusion, if people were more careful about the emotional climate they create in their important relationships, they could achieve a good prophylaxis for cardiovascular diseases.

Then, more research papers have investigated the relationship between the major components of the type A of personality: hostility, lack of time, lack of patience, competitiveness, with the long term risk of developing EAHT. Yan's et al. (2003) study has evaluated the relation between the type A psycho-behavioural, depression, anxiety and EAHT (minimum 140/90 mmHg or antihypertensive treatment). The only significant association has been obtained between the levels of hostility and lack of patience and the risk of developing clinical EAHT over a period of 10-15 years. Starting from these conclusions it is important to develop an efficient strategy of identification, change and management of the inappropriate psycho-social tendencies. Implementing it successfully at individual level, clinical and community level could have important implications in the prophylaxis and management of EAHT and other cardiovascular disorders. We can conclude that these factors do not influence directly the tension values, but no directly, in two ways: (1) encouraging inappropriate behaviour (smoking) and (2) have biological effects such as the increase of the cardiovascular/ neuroendocrine reactivity to stress.

By taking into account these results, it seems we are at a stage on which we start directing ourselves from the field of evaluation of psycho-social factors' importance in cardiovascular diseases, towards practical fields of efficient intervention upon them, stage on which clinical psychologists and psychotherapists have an important opinion to express. However, although in Romania there are jobs for psychologists in many medical clinics, what is missing from offering quality services to patients with EAHT is, on one hand, information and practice for psychologists, and on the other hand, real interest of doctors in psycho-social factors of risk, which, even if they are measured by the psychologist, they are not truly integrated in the general evaluation and

treatment of the patient (although they have a big prognosis power). Rozanski, Blumenthal and Kaplan (1999) considered that one of the biggest damage done to the patient is those extra 10 minutes which could be used for asking a few simple questions related to the patient's perception over his wellbeing, over various important areas from his life and his emotional state, thing that could mean a rapid evaluation of the depression risk and chronic stressful factors. These small steps could determine a big change because the doctor could tell the patient the fact that he cares about this type of symptoms which are part of the health concept (which does not mean lack of disability and invalidity only, but the physical, psychological and social wellbeing, from the perspective of the patient, according to WHO), that they are important for the evolution and treatment, the same way like biological parameters and before which is equally responsible for. At the same time, this new attitude could have a fundamental educational role regarding the fact that psycho-social risk factors for the cardiovascular disease can be evaluated and removed by the professionals, avoiding this way the ignorance and leaving the patient who has to make changes on his own regarding his lifestyle, but if he cannot do this, he reaches tardy stages when he gets to psychiatrists and/or with a number of severe cardiovascular complications. The multidisciplinary team will have to offer complex therapy services, but for this they will have to add, besides psycho-education regarding the quit of smoking, obeying some diet principles etc. and improvement of the depression symptomatology and anxious one and chronic stress by using specific techniques. If a part of the aspects related to the psychiatric and psychological evaluation has been done in a satisfactory way, what is not in order is a number of efficient psychotherapy interventions, which could be studied in great research programs. However, clinicians, from their need of practical answers, have tried to make such programs, such as Davidson, Hix, Vidt and Brotman (2006) who observed a significant benefit of a 12 week rehabilitation program, which contained psycho-educational sessions, evaluation of personality traits and emotional disorders, awareness of their effects on the wellbeing and social relations, learning and practical work on some self-control techniques and managing inappropriate behaviours, empowerment, assertive communication, physical exercises etc. in elderly patients. Although initially it was believed that these

psycho-social interventions of group could benefit only elderly patients, Lavie and Milani (2003) have demonstrated that these programs are equally important for the young patients too. They sometimes present a risk profile for cardiovascular diseases which is more severe than that for the elderly, due to the high frequency of obesity, dyslipidaemia, anxiety and hostility. After applying the psycho-social interventions it has been noticed that these patients presented a reduced level of anxiety, hostility and depression of 50% -60%.

Lavie and Milani (2003) estimated that only 5%-10% from heart sufferers have experienced a rehabilitation program because, on one hand, specialised clinics do not have such programs or they are not supported by competent people who are also interested in psycho-social interventions. On the other hand, patients do not seem really interested in such programs and it could be because of lack of recommendation of a specialised doctor and a lack of an official status of these interventions from the general therapy scheme.

In order to reach this goal of complex psycho-medical treatment there are a few problems which are related to the professional's attitude regarding the formation of multidisciplinary teams and discussion on all the important factors involved in the aetiology and prognosis of EAHT. On the other hand, there are problems related to time, material and human resources and lack of training programs for professionals. The convergent message of this team could determine the patient to become aware the responsibility that he has towards his body also his emotional state and the quality of relationships with the socio-professional field.

Taking into consideration the fact that, on one hand AHT represents a risk factor for cardiovascular diseases, CAV, kidney failure and death, and on the other hand the prevalence at world wide scale is worrying, of approximately 25 % of the planet's population, in year 2000 (Kearney et al., 2005), AHT represent a severe social problem. This increase of the prevalence of AHT occurrence is explained by World Health Organisation (WHO) due to an unprecedented increase of obesity and change of lifestyle (unhealthy food, lack of sport, chronic social stress). This situation led to the estimations done by WHO regarding the prevalence of AHT until 2010 will go very much higher.

The prevalence and occurrence of AHT is underestimated in national statistics (due to many undiagnosed and so, not recorded), having major financial implications for national public health systems.

Additionally, we have to take into consideration the fact that AHT does not occur only in elderly people; that is why this cardiovascular disease starts when patients are 30, 40 and 50, can evolve towards important complications which affect the people's ability to build a satisfactory socio-economic and professional status, contributing to the general decrease of workforce and becoming a multiple social resources consumer.

AHT is associated with severe cognitive deficits (dementia), which means an extra burden for health systems for medical care and home care and implies infrastructure, material and human resources.

In conclusion, due to the fact that AHT is a risk factor for premature disability and death. An efficient general prevention policy which especially includes a better psycho-social intervention, complex treatment strategy which takes into consideration all the factors involved and new types of medicine (Kearney et al., 2005).

Psychosocial risk factors of adherence to treatment

The quality of life (QoL) of the patient suffering from AHT can be affected from a physical, psychological and social point of view in the situation in which he chooses to follow the antihypertensive treatment (de medical one and change of lifestyle), as well as that in which he chooses to ignore the treatment. In the first case, a number of difficulties appear in respecting the diet, the program of physical exercises and also side effects of medication, but in the second situation the complications of the disease take place.

These facts lead us to conclude that, no matter the way a patient may choose, this activates a number of mechanisms for adaption (coping and self- defence mechanisms).

The improvement of treatments for chronic diseases has determined an increase in the interest for QoL. Because treatment in this case is not to cure the disease, but determines only a functional improvement, the disease progress slows down and suffering is diminished although it may have a negative effect on QoL. Symptoms, biochemical and physical evaluations of the disease represent the main indicators regarding the treatment effects which on the other hand do not regard the patient's QoL, which play an extremely important role in adherence to treatment (Testa, Simonson, 1996).

Although there are also studies which have obtained opposite results, meaning the improvement of QoL and deterioration of QoL sometimes it is difficult to clinically interpret these result from the QoL perspective because changes with statistical importance could not represent an important clinical modification from the perspective of the patient (score difference of QoL might not be enough for the patient to follow antihypertensive treatment). A minimum and significant difference is considered the smallest score difference in an important field for the patient, which can be perceived as a benefit which, in the absence of some severe secondary effects and an extremely high cost, determines the change of disease management at behavioural level. These results should not be a reason for the elderly hypertensive patients to refuse adherence to treatment.

Medical treatment for hypertension proposes to lower the cardiovascular risk of hypertensive patients with a minimum of side effects (Mulrow, Pignone, 2001). Secondary effects could be defined as symptoms that patients relate to medication without making the difference between the side effects of the treatment (symptoms which are due to treatment) and other events which coincide in time with the treatment, without being a necessarily cause by it.

Lack of adherence to treatment represents a major barrier in achieving the goal and potential benefits of the medication. Although the factors which determine lack of adherence to treatment are not known in patients with AHT (Svensson et al., 2000) or with other chronic disorders, a strong motivation has been identified, that of the existence of side effects, thing that determines some patients to give up on medication and determines other to continue to be adherent to treatment. The second situation take place in the presence of two conditions which interrelate: (1) side effects are interpreted by patients as being an indicator of efficiency of treatment and (2) the medication which are perceived as being efficient will probably be taken.

The first condition has empirical support as a result of three qualitative studies which showed that patients associated the curative power of medicines with the appearance of side effects presented a higher percentage of adherence.

The second condition is based on the idea according to which the compliant behaviour is up to a certain extent rational. Non-compliant behaviour can be divided into two categories: unintentional

(the person forgets to take the medicine) and intentional. The models of social cognition consider that intentional non-adherence is due to a comparison between the advantages and disadvantages of a treatment, following which the patient considers that benefits are not sufficient enough to make the effort to follow the treatment. From this point of view, it is very clear the fact that in the process of balancing and comparing the strong and weak points of the treatment, an extremely important role is held by the interpretation of side effects as being pros and cons indicators for medicine. Although the study of Svensson, Kjellgren, Ahlner and Saljo (2000) has initially started from the idea of other research related to the fact that patients who follow the treatment and experience side effects of it will evaluate a cardiovascular lower risk than non-adherent hypertensive patients, results have shown the opposite thing especially in the case of patients who considered that the most important complications of AHT will happen no matter what, while they consider the cardiovascular risk as being extremely big and could not be avoided (perception as low efficiency of treatment). In conclusion, there is a category of hypertensive patients who are adherent to treatment, even if there is a perception of non-efficiency of treatment.

We can observe a lack of consistency of results, which could be the partially explained by the different meaning given by various researchers and patients to some terms as side effects or therapeutic efficiency. However, the existence of adherence to treatment even if there is a perception of lack of treatment efficiency can be explained by an exaggerated anxiety which determines the patient to do everything to stop the appearance of hypertensive complications, although he does not believe in the therapeutic success, whether it is a previous attitude to obey authority due to which the patient respects the doctors recommendations, maintaining the same scepticism. The future studies will probably have to use a quantitative and qualitative methodology in order to be able to divide important answers from a clinical point of view like the one related to the existence of an optimum of side effects which could determine a positive interpretation and increase of adherence to treatment.

Many people who follow the antihypertensive treatment consider that they do not have to have another lifestyle. We have to mention the fact that there are numerous situations in which the medication only is

not efficient enough to reduce the tension values to an optimum, the non-medicated treatment being a good and necessary one. This lifestyle can determine a decrease of the dose of antihypertensive drugs, which means a decrease of the number of side effects induced by medicines.

Conclusions

AHT represent a severe social problem. AHT affects the people's ability to build a satisfactory socio-economic and professional status, contributing to the general decrease of workforce and becoming a multiple social resources consumer.

The patient has to understand that mental health is a very important part for the evolution and treatment, in the same way like biological parameters. On the other hand, the psycho-social risk factors for the AHT can be evaluated and removed by the professionals (clinical psychologists, psychotherapists), avoiding this way the ignorance and leaving the patient who has to make changes on his own regarding his lifestyle, but if he cannot do this, he reaches tardy stages when he gets to psychiatrists and/or with a number of severe cardiovascular complications. The multidisciplinary team will have to offer complex therapy services, but for this they will have to add, besides psycho-education regarding the quit of smoking, obeying some diet principles etc. and improvement of the depression and anxiety symptomatology and chronic stress by using specific techniques. We need to mention that a change in lifestyle is important in the case of any patient who suffers from AHT, contributing to the reduction of the risk of some serious health problems such as heart failure, stroke, myocardial infarction. The hypertensive patient can build the same interesting life like any other person, but for this he need to consider AHT a serious problem which on the other hand he can control by active involvement in the non-medication treatment and strictly obeying the rules of medication.

References

Adamis, D. and Ball, C. (2000). Physical morbidity in elderly psychiatric inpatients: Prevalence and possible relations between the major

- mental disorders and physical illness. *International Journal of Geriatric Psychiatry*, 15(3), 248-253.
- Davidson, M. B., Hix, J. K., Vidt, D. G. and Brotman, D. J. (2006). Association of Impaired Diurnal Blood Pressure Variation With a Subsequent Decline in Glomerular Filtration Rate. *Internal Medicine*, 166(8), 846-852.
- De Vogli, R., Chandola, T., Kivimaki, M. and Marmot, M. G. (2007). Negative Aspects of Close Relationships and Heart Disease. *Archives of Internal Medicine*, 167(18), 1951-1957.
- Fallsberg, M. (1991). Reflections on Medicines and Medication. A Qualitative Analysis Among People on Long-Term Drug Regimes. Linköping University, Linköping.
- Grassi, G. and Esler, M. (1999). How to assess sympathetic activity in humans. *Journal of Hypertension*, 17(6), 719-734.
- Iamandescu, L. B. (2002). Stesul psihic din perspectiva psihologică și psihosomatică. Infomedica, Bucuresti.
- Jones-Webb, R., Jacobs, D. R., Flack, J. M. and Liu, K. (1996). Relationship between depressive symptoms, anxiety, alcohol consumption, and blood pressure: Results from the CARDIA study. *Alcoholism: Clinical and Experimental Research*, 20(3), 420-427.
- Kario, K., Schwartz, J. E., Davidson, K. W. and Pickering, T. G. (2001). Gender differences in associations of diurnal blood pressure variation, awake physical activity, and sleep quality with negative affect. *Hypertension*, 38(5), 997-1002.
- Kearney, P. M., Whelton, M., Reynolds, K., Muntner, P., Whelton, P. K. and He, J. (2005). Global burden of hypertension: analysis of worldwide data. *Lancet*, 365, 217-223.
- Kubler-Ross, E. (1976). Les derniers instants de la vie. Labor et Fides.
- Lavie, C. J. and Milani R. V. (2003). Obesity and cardiovascular disease: the Hippocrates paradox? *Journal of the American College of Cardiology*, 42, 677-679.
- Light, K.C. (1987). Psychosocial precursors of hypertension: Experimental evidence. *Circulation*, 76(Suppl I), 67-76.
- Mulrow, C. and Pignone, M. (2001). What are the elements of good treatment for hypertension? *British Medical Journal*, 322, 1107-1109.
- Pilgrim, J. A., Crawford, M., (1993). Low blood pressure and well being. *British Medical Journal*, 306(6878), 655.
- Rabkin, J., Charles, E. and Kass, F. (1983). Hypertension and DSM-III depression in psychiatric outpatients. *American Journal of Psychiatry*, 140(8), 1072-1074.

- Rosengren, A., Hawken, S., Ounpuu, S., Sliwa, K., Zubaid, M., Almahmeed, W.A., Yusuf, S. (2004). Association of psychosocial risk factors with risk of acute myocardial infarction in 11 119 cases and 13 648 controls from 52 countries (the INTERHEART study): case-control study. *Lancet*, 364(9438), 953-962.
doi:10.1016/S0140-6736(04)17019-0
- Rozanski, A., Blumenthal, J. A. and Kaplan, J. (1999). Impact of psychological factors on the pathogenesis of cardiovascular disease and implications for therapy. *Circulation*, 99(16), 2192-2217.
- Scalco, M. Z., Serro-Azul, J., Giorgi, D., Almeida, O. P. and Wajngarten, M. (2003). Effect of nortriptyline on the day-night systolic blood pressure difference in hypertensive and normotensive elderly depressed women. *American Journal of Cardiology*, 91(10), 1279-1281.
- Shen, X. Z., Xiao, H. D., Li, P., Lin, C. X., Billet, S., Okwan-Duodu, ...Fuchs, S. (2008). New insights into the role of angiotensin-converting enzyme obtained from the analysis of genetically modified mice. *Journal of Molecular Medicine*, 86, 679-684.
- Svensson, S., Kjellgren, K. I., Ahlner, J. and Saljo, R. (2000). Reasons for adherence with antihypertensive medication. *International Journal of Cardiology*, 76, 157-163.
- Testa, M. A. and Simonson, D. C. (1996). Assessment of quality-of-life outcomes. *The New England Journal of Medicine*, 334, 835-840.
- Townsend, M. H., Bologna, N. B. and Berbee, J. G. (1998). Heart Rate and blood pressure in panic disorder, major depression, and comorbid panic disorder with major depression. *Psychiatric Research*, 79(2),187-190.
- Yan, L. L., Liu, K., Matthews, K. A., Daviglius, M. L., Freeman Ferguson, T., Kiefe, C. I. (2003). Psychosocial Factors and Risk of HypertensionThe Coronary Artery Risk Development in Young Adults (CARDIA) Study. *Journal of American Medical Association*, 290(16), 2138-2148.