

Medical Sciences

Relationship between Depression and Religiousness with the Atherogenic Profile of Lipoproteins in Arterially Hypertensive Patients

Nodar Kipshidze*, Sesili Kabisashvili**, Nona Kakauridze**

* Academy Member, National Centre of Therapy, Tbilisi

** National Centre of Therapy, Tbilisi

ABSTRACT. The research carried out during the last two decades made it possible to confirm from the standpoint of the proof-based medicine the relationship of stress, mental depression and anxiety with the cardiovascular system diseases (CVSD). The majority of depressive persons has been found to manifest a higher percentage of a coronary heart disease (CHD), arterial hypertension and other cardiovascular pathologies. According to an analytical forecast of the World Health Organization, by 2020 CVSD and mental depression will be leaders in reducing full-value life in the whole world. Lately, more obvious has become the interest of science in studying the relationship of religion with depression, stress, and AH, since many studies are known to have corroborated the existence of a direct correlation between the said factors. Proceeding from the above, a comprehensive study of the relationship between depression and CVSD presents a rather topical problem of medicine.

The purpose of the study is to establish a relationship between religiousness, mental depression and lipids in patients with AH.

Elderly patients aged 60 to 74 were subjects of our study. Patients were divided into four groups according to their sex and religion. The depressive state used to be determined by the Fallstein Geriatric Depression Scale. Religiousness was measured according to personal prayers and the frequency and regularity of participation in religious rituals. The studies revealed these criteria to be most sensitive in terms of evaluation of religiousness. Of biochemical parameters, the following were measured in blood serum: TCh, Tg, HDLCh, LDLCh. As a result of an analysis of the study results, the following data have been obtained: a reliably low depression assessment points are observable in the believers against the non-believers; respectively, in the believer males a low correlation of depression, AH and TCh is observed. In the non-believer males a high direct correlation of depression and AH, AH and TCh, LDLCh and Tg is observed. In the believer females, a negative correlation of depression and TCh, LSLCh and Tg is observed, whereas in the non-believer females such correlation is positive. Proceeding from the above, the favorable impact of religiousness on the manifestations of depression, as well as the AH and lipid metabolism can be assumed. © 2007 Bull. Georg. Natl. Acad. Sci.

Key words: *lipides, depression, religion, arrhythmia.*

The relationship of stress, mental depression and anxiety with the cardiovascular system diseases (CVSD) has long been known, although only during the last two decades such correlation could be confirmed from the standpoint of the proof-based medicine. As a result of long-term prospective studies, it has been revealed that the majority

of depressive persons is found to have or to frequently develop an ischemic heart disease (IHD), arterial hypertension (AH), acute myocardial infarction (AMI), and an ischemic stroke [1, 2]. Concurrently, from the standpoint of a CVSD development risk, of importance is not only the clinically apparent “big depression” but also the less mani-

fested depressive semiotics. The epidemiological studies carried out during the last decade have revealed high percentage of spread of anxiety, mental depression and other disorders of the depressive spectrum in the general medical and CVS diseases' treatment practice, which significantly exceeds their prevalence in a population [3, 4]. Both IHD and psychopathological disorders clearly deteriorate the human work-status, social functionality, adaptability and represent a serious problem for the contemporary society in terms of expenditures. According to an analytical forecast of the World Health Organization, by 2020 CVSD and mental depression will become the leading cause of reducing full-value life in the whole world [5]. It is established that upon coexistence of IHD and mental depression in patients, the social functionality indicators are twice lower than in case of existence of any one of these two diseases [4, 5]. Clinical studies have also demonstrated that a mental depression and an anxiety-depressive state worsen the CVSD state, negatively affect the treatment, rehabilitation and prevention processes [4-6]. Lately, more obvious is becoming the interest of science to study the relation of religion with mental depression, stress, and AH. Many studies are known to have corroborated the existence of a direct correlation between the said factors [4, 6-8]. Prayer has been found to reduce depressive semiotics both in females and males [4, 6]. Proceeding from all the above, a comprehensive study of the relationship between mental depression and CVSD presents a rather topical problem of medicine.

The purpose of the study is to establish a relationship between religiousness, mental depression and lipids in patients with AH.

Material and methods

117 elderly patients aged 60 to 74 were subjects of our study. Sixty patients were female, and fifty-six were male. According to religion, the patients were distributed into four groups: group I – 28 believer males; group II – 32 non-believer males; group III – 29 believer females; and group IV – 28 non-believer females. Depressive state used to be determined by the Fallstein geriatric depression scale that being designated to serve as a basic screening measure for functional status in older adults and their adaptation to the environment (1983). The results were assessed by points: 1-22 points indicate low-grade depression; over 22 points – full-blown depression. Religiousness was established according to personal prayers and the frequency and regularity of participation in religious rituals (weekly participation in church rituals), as well as the length of religious affiliation (not less than 10 years). The studies revealed these criteria to be most sensitive in terms of evaluation of religiousness [2, 9].

Of biochemical parameters, the lipid spectrum was determined in blood serum (following a 13-hour fasting on the empty stomach) by means of a spectrophotometer JENWAY-6400, using the enzymatic technique: total

cholesterol (TCh) – GPO Kit BOPLABO, France, while high-density lipoprotein cholesterols (HDLCh) were measured following precipitation of low-density lipoprotein cholesterols (LDLCh) and very low-density lipoprotein cholesterols (VLDLCh) - (HDL Cholesterol (Precipitant) SFBC BIOLABO, France). LDLCh were measured according to Friedwald (1972) under the formula: $LDLCh = TCh - (HDLCh + VLDLCh)$ (Klimov A.N., Nikulcheva N.G., 1995). The AH degree was measured by the JNS VII classification; HID was diagnosed according to anamnesis, clinical presentations and the loading test. The following methods were used: for statistical processing of the material - $M \pm SD$ (M -medium, SD -standard deviation); for data analysis – Student's t-test ($p < 0.05$), for determining correlation (C) – Pearson method.

Results and discussion

Based on different studies, the relationship of religiousness with the CVSD development, as well as its risk factors: gender, age, dyslipidemia, hypertension, psychocharacterologic peculiarities were established [4, 6-8]. Hypertension occupies a special place in the pathogenesis of the development of such fatal complications as myocardium infarction, stroke, sudden death, especially among elder patients. From this point of view, also of interest is the fact that hypertension is a somatic manifestation of disadaptation which is in close relationship with the psychocharacterologic peculiarities on the one hand, and with the endothelium's dysfunction on the other, which causes the development of atherosclerosis.

We studied elderly people (aged 60-70) of both sexes with arterial hypertension of grade I and grade II, as a contingent with a risk to develop CVSD complications. The contingent was selected so that the groups would not show statistically reliable differences by the systolic and diastolic pressure figures ($p > 0.05$). This makes it possible to assess the parameters of other risk factors for CVSD against the background of the arterial pressure constant. The results of the study conducted by us are given in the Table below.

According to our study results, a reliably low indicator (5.6 ± 3.7) was observed in Group I – believer males as compared with non-believer males (12.16 ± 7) $p < 9.88 \text{ E}8$. Similar data were obtained for females as well: in Group III – believer females the depression indicator (6.8 ± 4.3) is reliably low as compared with Group IV – non-believer females (13.5 ± 3.5) $p < 4.9 \text{ E} - 0.7$. The reason of the above can be probably religious consciousness encompassing components which in each specific situation, including under stress conditions, are directed at self-knowledge and cognition of the environment, the establishment of tolerance and the looking for a conformist way out, which conditions the establishment of psycho-adaptive mechanisms. In addition, an essential factor for religious consciousness is a hopeful attitude to future, which preconditions vitality at all ages. Also important are collectivity

Table 1

Pressure, lipid spectrum and depression indicators by religious division in the patients of both sexes

Group	SAP mmHg	DAP mmHG	TCh mg/dl	LDLCh mg/dl	HDLCh mg/dl	Tg mg/dl	DEP
I	165.9±8.3	86.1± 4.9	192.5±55.4	136.4± 9.3	47.1± 8.9	125.4±46.2	5.6±3.7
II (M±SD)	167.2±12	89.1 ± 10.4	232.1±6.7	140.7±39.9	42.1± 8.9	191.6±72.2	12.16±7
III (M±SD)	163.3 ±9.3	86.2± 4.6	219.9±42.9	143.2±43.6	47.0± 12.7	124.67±45.39	6.8±4.3
IV (M±SD)	166.7±10.6	87.6 ± 10.7	252.1±46.3	171.3±34.1	33.2±14.8	175.07±76.26	13.6±3.5
P I-II	0.6	0.1	0.005	0.6	0.03	0.0001	9.88 E8
P III-IV	0.2	0.5	0.01	0.01	0.2	0.002	4.9E07
P I-III	0.2	0.8	0.04	0.50	0.9	0.9	0.2
P II-IV	0.8	0.6	0.1	0.003	0.5	0.4	0.1

Note: SAP – systolic arterial pressure; DAP – diastolic arterial pressure; TCh – total cholesterol; LDLCh – low density lipoprotein cholesterol; HDLCh – high density lipoprotein cholesterol; Tg – triglycerides; DEP – depression scale indicators; (M±SD): M – medium indicator; SD – standard deviation; P – reliability coefficient ($p > 0.05$).

and mutual aid. These assumptions are shared by many authors in whose studies a direct correlation of depression and tolerance is being observed [4]. The practice of praying and the participation in religious rituals are among the most important components of religiousness, which conditions the establishment of orderliness. Many experimental and epidemiological works by various authors, which are focused on the study of a relationship between depression and religiousness, evidence a favorable impact of the regularity of religious practice upon the psycho-emotional state of man. According to some authors, SAP, DAP, and pulse indicators improvement is observable against the background of prayer [4, 6-8]. The central place in the consciousness of a religious person is occupied by the belief in God, which probably represents the guiding force that preconditions overcoming personal weaknesses in conducting an organized religious mode of life and is distinguished thereby from non-religious persons who, as a rule, find more problems in following the healthy mode of life due to weaknesses of the character.

The lipid spectrum analysis revealed the following: low degree of correlation: in Group I - 192.5±55.4; in Group II - 232±6.7 ($p < 0.005$); LDLCh: in Group I – 136.4±9.3; in Group II – 140.7±39.9 ($p < 0.06$); HDLCh: in Group I – 47.1±6.7; in Group II – 42.1± ($p < 0.03$), and reliable Tg indicators: in Group I - 125.4±46.2; in Group II – 191.6±72.2 ($p < 0.0001$). Against Group III and Group IV the following indicators were observed: Correlation: in Group III – 219.9±42.9; in Group IV – 252.1±46.3 ($p < 0.01$); LDLCh: in

Group III – 143.2±43.6; in Group IV – 171.3±34.1 ($p < 0.01$); HDLCh: in Group III – 47.0±12.7; in Group IV – 33.2±14.8 ($p < 0.03$); Tg: in Group III - 124.67±45.39; in Group IV – 175.06±76.25 ($p < 0.002$).

According to numerous study data, the lipid metabolic disorder is one of the principal components in the development of atherosclerosis. At the same time, a concentration of individual fractions of the lipid spectrum in blood serum and a disorder of their correlation are of importance in the endothelium damage pathogenesis. Experimental studies evidence that an increase in the concentration of LDLCh and a decrease in the concentration of HDLCh condition the endothelium damage and impairment of its vasodilative function. There is a difference of opinions regarding an increase in Tg concentration as being an independent pathogenic component, although according to the guidelines of the International Atherosclerosis Society (IAS), a relationship between Tg and the development of atherosclerosis has been established, especially under conditions of an increase of the concentration of Tg and high concentration of LDLCh, or a decrease in the concentration of HDLCh, or in both cases concurrently [10]. As is noted, the level of lipids in blood is characterized by variability according to the individual biological indicators of man. Physiological changes under conditions of a stress represent one of such variations. At this time a prolonged and relatively stable increase of lipoproteins in the serum is being observed [4, 7, 10]. In addition, there exist data evidencing a relationship between a concentration of

atherogenic lipoproteins and psychocharacterologic peculiarities [4, 10]. As our study results indicate, the atherogenic LP concentration in the serum in the group of believers, both male and female, is reliably low against the non-believers, which can be explained by psychoadaptive peculiarities of the believers and low indicators of the depressive manifestation. There are experimental study data, according to which the concentration of TCh in the serum is found to decrease during praying [3, 4]. Another variation is the character of diet. Diet peculiarities occupy an important place in the mode of life of believers, which is expressed by the consumption of low-calorie, vegetable food in the period of fasting (195 days a year on average), as well as by restriction of the food consumed. The reliably low concentration of Tg in the serum among believers, indicated in our study results, might be conditioned by the above.

As a result of the study, the following correlation has been found: in Group I – light C of DEP and TCh, $r=0.33$; in Group II – high C of DEP and SAP, $r=0.71$; DEP and DAP, $r=0.42$; SAP and Tg, $r=0.52$; DAP and LDLCh, $r=0.59$; in Group III: a negative correlation of DEP and TCh, $r=0.33$; DEP and LDLCh, $r=0.35$; in Group IV – DEP and SAP, $r=0.73$; DEP and Tg, $r=0.32$; DEP and LDLCh, $r=0.43$.

An analysis of the obtained results enables to state that the lipid metabolism in the group of believers approaches physiological standard, which conditions a lesser risk for the endothelium damage even under high AH conditions among the believers. This is evidenced by a clinical characterization analysis of the groups studied by us: in Group I – AH 0 – 21.7%, AH I – 25%; in

Group II – 30%. Of the concomitant diseases: angina – 14.3%, heart insufficiency – 37.8%; arrhythmia – 14.3%; in Group II – AH 0 – 9.7%. AH I – 46.9%, AH 2 – 43.7%, angina – 43.7%, heart insufficiency – 53.1%, arrhythmia – 25%; in Group III – AH 0 – 33.3%. AH I – 66.6%, AH 2 – 7.4%, angina – 19.4%, heart insufficiency – 22.2%, arrhythmia 7.4%; in Group IV – AH 0 – 21.4%. AH I – 39.3%, AH 2 – 39.3%, angina – 34.3%, heart insufficiency – 37.9%, arrhythmia – 25%.

Conclusions

Religiousness represents a potent factor in prevention of CVSD and its risk factors (depression, hypertension, dyslipidemia) in the people of both sexes, since religiousness leads to a reliable reduction of a depressive state during arterial hypertension, which conditions the preservation of adaptability in such components of the homeostasis as the lipid spectrum and the renin-angiotensin system:

– During arterial hypertension less frequent cases (reliably low assessment points) of depression are observed in believers as compared with non-believers.

– Non-believer males show higher direct correlation between depression and AH, as well as between AH and TCh, LDLCh and Tg, whereas believer males, respectively, demonstrate only a weak correlation between depression, AH and TCh.

– High correlation between depression and AH, LDLCh and Tg has been established in non-believer females in contrast to believer females where such relationship is not observed.

სამედიცინო მეცნიერებანი

დეპრესიისა და რელიგიურობის კავშირი ლიპოპროტეიდების ათეროგენულ პროფილთან არტერიული ჰიპერტენზიის მქონე პაციენტებში

ნ. ყიფშიძე*, ს. კაბისაშვილი**, ნ. კაკაურიძე**

* აკადემიის წევრი, თერაპიის ეროვნული ცენტრი, თბილისი

** თერაპიის ეროვნული ცენტრი, თბილისი

ბოლო ორი ათეული წლის განმავლობაში ჩატარებული კვლევების შედეგად შესაძლებელი გახდა სტრესის, დეპრესიისა და გულსისხლძარღვთა დაავადებების ურთიერთკავშირის დადასტურება მტკიცებაზე დაფუძნებული

მედიცინის პოზიციიდან. აღმოჩნდა, რომ იმ პირებში, ვისაც დეპრესია აღენიშნებოდა, არტერიული ჰიპერტენზია და სხვა გულსისხლძარღვთა პათოლოგია გამოვლინდებოდა მაღალი პროცენტით. ჯანმრთელობის დაცვის საერთაშორისო ორგანიზაციის ანალიტიკური პროგნოზის მიხედვით 2020 წ. მთელ მსოფლიოში სრულფასოვანი სიცოცხლის შემცირების თვალსაზრისით გულსისხლძარღვთა დაავადებები და დეპრესია ლიდერები იქნება. ბოლო პერიოდში აღინიშნება მეცნიერების დანტერესება რელიგიის კავშირის შესწავლით დეპრესიასთან, სტრესთან და არტერიულ ჰიპერტენზიასთან. ჩატარებულია კვლევა, რომელიც ადასტურებს აღნიშნულ ფაქტორებს შორის პირდაპირ კორელაციურ კავშირებს. აღნიშნულ ფაქტორებს შორის კავშირის სრულყოფილი შესწავლა მედიცინის მეტად აქტუალური ამოცანაა.

REFERENCES

1. E.A. Gogin (2000), Clinical Medicine, No. 11, pp. 4-7 (Russian).
2. A.I. Chazov, et al. (2007), Clinical and epidemiological program for studying depression in cardiology practice, in patients with arterial hypertension and coronary heart disease: (COORDINATA) long-term study results. Cardiology, No. 3, pp. 28-37 (Russian).
3. Sander G. Robbins (2001), Correction of lipid abnormalities. Basic principles and practical implementation of therapeutic interventions. Moscow: Medicine, p. 176 (Russian).
4. E.L. Idler, M.A. Musick, M.A. Ellison, N. Krause, M.G. Ory, et al. (2003), Measuring multiple dimensions of religion and spirituality for health research: conceptual background and findings from the 1998 General Social Survey. Research on Aging, 25: 327-365
5. Fetzer Institute/National Institute on Aging Working Group. (1999). Multidimensional measurement of religiousness/spirituality for use in health research.
6. B.S. Jonas, M.E. Mussolino (2000), Symptoms of depression as a prospective risk factor for stroke. Psychosomatic Medicine, 62 463-471.
7. J.W. Hughes, C.M. Stoney (2000). Depressed mood is related to high-frequency heart rate variability during stressors. Psychosomatic Medicine 28,179-185
8. V.M. Wilkins (2005), Religion, Spirituality and Psychological Distress in Cardiovascular Disease, Doctor of Philosophy. Drexel University.
9. H.G. Koing, D.O. Moberg, J.N. Kvale (1988), Religious activities and attitudes of older adults in a geriatric assessment clinic. J Am Geriatr Soc., 36 (4): 362-374.
10. B.S. Jonas, J.F. Lando (2000), Negative effect as a prospective risk factor for hypertension. Psychosomatic Medicine, 62: 188-19.

Received August, 2007