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## The Prevalence Of Metabolic Syndrome In Older People: “Attitude Towards Population Success”

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### ABSTRACT

The problem of various components of MS is at the center of attention of modern medical science and healthcare.

Kazno Toushita reports (2018) that in Japan, almost half of Japanese men and a quarter of Japanese women are either visceral obesity or overweight, and that the number of such patients increases with age. There fore, a special prevention program was launched in 2008, and now medical insurance companies must provide annual check-ups for all people between the ages of 40 and 75.

### KEYWORDS

Blood pressure, metabolic syndrome, older people

### INTRODUCTION

After the initial examination, patients are divided into 4 groups: patients requiring immediate medication; patients with MS, patients with pre-metabolic syndrome, and patients without MS. First of all, to assess

patients, the waist circumference is checked and the body mass index is determined, then RF is detected: smoking, fasting plasma glucose, glycated hemoglobin, cholesterol, high density lipoproteins, blood pressure. After

6 and 12 months, the intermediate results of the program are evaluated. Japanese experience: First counseling is provided by a physician, nurse, and nutritionist who is authorized to participate in the program. Further, the patient's health is monitored either by a trained trainer, or by a nurse and other specialists. Patients are encouraged to reduce weight gradually: 3 kg in 3 months. A 3-5% weight loss has been shown to help prevent further development of MS [11].

According to the analysis carried out by Drapkina O.M. (2018) currently every 4th inhabitant of our planet has a BMI or is obese. With the spread of obesity, severe somatic diseases associated with it multiply and worsen: DM-2 (90% of patients with DM-2 are obese), AH, IHD, atherosclerosis [12]. One of the most common types of MS is liver steatosis. According to the analysis of clinical variants of MS, among 60 patients, and 60% of them were men, mean age  $48.7 \pm 13.0$  years, hepatic steatosis was detected in 100% of patients, AH - in 88%, atherogenic DLP - in 52%, non-alcoholic steatohepatitis - in 42%, coronary artery disease - in 35%, biliary sludge - in 32%, gallstone disease - in 20%, impaired glucose tolerance - in 15%, diabetes - in 10%, gallbladder cholesterosis - in 10% [24]. In the Russian recommendations for the prevention of chronic chronic diseases, published under the editorship of S.A. Boytsov (2013), it is emphasized that another main component of metabolic syndrome - diabetes is widely recognized as the most dangerous challenge to the world society. Diabetes mellitus became the first non-communicable disease, the global threat of which prompted the UN in 2006 to adopt Resolution 61/225, calling on all countries to unite in the fight against diabetes, including "to create national programs for the prevention, treatment and

prevention of diabetes and its complications and to include them in the composition of state health programs" [18].

Paulweber B. et al. (2010) American Diabetes Association (2013) stated that in the Russian Federation over the past 10 years, according to the control and epidemiological studies conducted in large regions of the Russian Federation, the true number of patients with diabetes in Russia is 3-4 times higher than the official statistics and is 9 -10 million people (6-7% of the total population of Russia), while about two-thirds of them do not know about their disease. The epidemiological scale of the prevalence of diabetes requires colossal costs of treating the disease (10-18% of the budgets of health care systems in different countries), growing exponentially, which makes the problem of prevention of diabetes mellitus a priority for public health [25, 42].

## MATERIALS AND METHODS

Researchers from far abroad Mazzali M. et al. (2002), Milions H. et al. (2004) in their studies showed that the problem of the relationship between hyperuricemia (HU), AH and MS is becoming more and more relevant due to the fact that such a combination of pathologies is often encountered in real clinical practice [36, 37]. Puig J., Martinez M. (2008) proved a fairly high prevalence of GU 90.2% among the population of the older age group. Among people with hypertension, the prevalence of GU ranges from 14.2% to 19.3%. Vordecchiue P., Shillaci G., Keboldi G et al (2000), based on the results of a population analysis in 7978 patients with hypertension in the New York Study, proved that GH exceeds the risk of developing CVD by 1.53 times, exceeding the risk from smoking and obesity. The combination of HU and AH increases the risk of developing CVC by

5 times. In Australia, HY (increased uric acid content  $\geq 370$  mmol / L in men and  $\geq 274$  mmol / L in women) has been shown to be an independent predictor of increased risk of cardiovascular morbidity [45].

MS, with all its components, is characterized by an increase in the mass of visceral fat, a decrease in the sensitivity of peripheral tissues to insulin and GI, which causes impairment of carbohydrate, lipid, purine metabolism and hypertension [23]. In modern guidelines, based on the results of large randomized multicenter and epidemiological studies, factors influencing the development of MS are indicated: genetic disposition, overfeeding, OSAS, physical inactivity and hypertension:

Known gene for insulin receptors, which is localized on the 19th chromosome. More than 50 gene mutations have been described; MS is genetically determined.

The accumulation of world masses in the body is based on overeating animal fats containing saturated fatty acids. If the mass of consumed fat exceeded the body's ability to oxidize, then obesity develops and progresses. Regarding OSAS and MS problems:

OSAS often accompanies MS, and at present the combination of these conditions is commonly referred to as syndrome Z;

obesity is the main risk factor for the development of OSAS, which affects 50% of accurate people;

if OSAS develops in connection with the presence of other RF, MS may be a consequence of breathing disorders during sleep [20];

A decrease in FA (hypodynamia) and AH, the leading factors after overeating in importance,

contributing to the development of obesity and IR, in general MS [23].

WHO experts assessed the current situation on the prevalence of MS in the following way: "We are faced with a new pandemic of the 21st century, covering the industrial development of the country. This may turn out to be a demographic catastrophe. MS is 2 times higher than the prevalence of diabetes, and in the next 25 years its growth is expected to increase by 50%" [48].

Over the past 15 years, more than 20 epidemiological studies have been carried out, Mamedov M. et al. (2007) citing the met analysis of large-scale studies devoted to the prevalence of MS, showed that in the population of the older age group, MS is characterized by specific characteristics: 1) it is diagnosed from 10% in China to 24% in the United States; 2) in the development of MS, a priority role is played in - age, postmenopausal status in women, NFA, the predominance of a carbohydrate diet, socio - economic status; 3) on a random sample of the adult population of the Chuvash Republic of the Russian Federation, 20.6% of persons aged 30 - 69 had MS, in women this syndrome occurs 2.4 times more often, with age the number of patients increases; 4) in the age range of 30-39 years, MS was found in 1%, at 10-49 years - in 3.6%, at 50-59 years - in 9%, 60-69 years - in 7% of the respondents.

An important conclusion from the results of this study: the frequency of the prevalence of MS in the elderly population increases more than 7 times [13].

Chazova I.E., Mychka V.B. (2006) conducted an interim analysis of the results of an open, multicenter, randomized study MINOTAVR.

The results of this study, as well as data from a meta-analysis of three prospective studies: IRAS (Insulin Resistance Atherosclerosis Study), MSDS and SAHS (San Antonio Heart Study), lasting 5-7.5 years, which tracked incidents of developing diabetes in various groups with MI showed that in persons with MS and IGT, the risk of developing SR in the next 5 years is 40%, which is 2.5 times higher than in the group of patients with IGT without MS. In patients with MS and normal glucose tolerance, the risk of developing diabetes was almost 3 times higher compared with practically healthy people [23, 26]. In multicenter studies of IVF, MINOTAVP and APRIL in Russia, the most significant factors in the formation of MS and AH were identified, this made it possible to formulate a criterion for the diagnosis of MS and determine the priority areas of prevention and drug exposure [2, 16].

Statistics show specific and important issues for geriatric science and practice. So, today it is known that the time is rapidly approaching when there will be more elderly people in the world than young people. Between 2000 and 2050, the world's population aged 60 and over more than tripled, from 600 million to 2 billion. [30] This demographic change has a number of health implications. Life-long measures to prevent RF, MS and other conditions can prevent or delay the onset of CND (CVD, stroke, cancer and diabetes). WHO works in the prevention of chronic chronic diseases and risk factors for their development, ensuring access to primary health care with favorable conditions for the elderly and creating an environment favorable for the elderly;

These measures have a direct positive impact on aging and natural diseases and their risk factors, including the elderly and senile population [1,3,17,16].

Conducted one-stage comparative study Kobyakova O.S. et al. (2018) in 1668 doctors of the Tomsk region showed that at the age of 60-69 years, three components of MS-hyperglycemia (5.9%), DLP (40.0%), and BMI (73.1%) begin to prevail. age > 70 years, the highest common increase in blood pressure (23.5%). Consequently, it is possible, and in old age, the picture of the spread of RF CNZ changes, there is a transformation of behavioral factors into metabolic ones, i.e. in metabolic syndrome [8]. A similar epidemiological situation, according to epidemiological studies, is typical for other countries: Melania, India [32], South Africa, USA [44], Cameroon [35], Portugal [28] and Czech Republic [40]. The reasons for the high frequency of metabolic risk factors in the elderly and senile population in different regions of the world can be a sedentary lifestyle and work, nutritional factors (especially important for surgical specialties), as well as the daily work of doctors, especially the elderly [8]. There is a need to develop separate programs for the prevention of metabolic syndrome and "terminal kidney" from it in elderly doctors. At the same time, separate epidemiological studies aimed at studying this in the population of doctors of the older generation are few, and in our country they have not been carried out.

It should be noted that the concept of metabolic syndrome was proposed for a better understanding of the mechanisms of development of CVD associated with metabolic and hemodynamic disorders [9]. Over the past half century, on the basis of this concept, as a new stage in the development of the formed representations, a new syndrome has been written - "Early vascular aging syndrome" (RSS). Metabolism // MS

(hyperglycemia, dyslipidemia, decreased insulin sensitivity) is one of the main factors in the acceleration of vascular aging, that is, RCC [19,29,31,38,39].

According to the results of the meta-analysis performed by Karpov Yu.A. and Shubina A.T. (2016) found that AH in patients with MS is associated with a high risk of CVA. Blockers of the renin-angiotensin system and calcium antagonists are recommended as the first-line drugs for the treatment of hypertension (secondary drug prevention) in patients with MS. Such secondary drug prophylaxis of MS components allows to reduce the risk of unfavorable cardiovascular and renal outcomes in patients with MS, especially in elderly and senile patients [9]. With irrational drug prevention, according to Hanefed M., Pistrsch F. Et al (2014), Shubina A.L. et al. (2001), MS is also associated with disorders of the fibrinolysis system, activation of lipid peroxidation processes, impaired endothelial function, MAU and is characterized by an increased risk of developing type 2 diabetes and cardiovascular continuum [20, 33].

In another study by Ridden L., Crant P.J. et al (2013), conducted in Europe with the participation of 52 researchers, in patients with MS, the risk of developing coronary artery disease is increased by 2 times, and the risk of diabetes mellitus is 5 times higher [46].

Mohort T.V., Mohort E.G. (2016) in their studies proved that in the 21st century, with a progressive increase in life expectancy, an increase in the incidence of diabetes mellitus, the need to maintain a full quality of life in people of the older age group, the relevance of the study of cognitive impairments acquires priority significance. The authors present important epidemiological information and the

following official statistics, which, in our opinion, are needed for the prevention and treatment of central nervous system lesions in MS in the elderly population: if any method of prevention can be delayed by 1 year, it will be almost by 800 thousand fewer cases of the disease; ... in persons 60 years and older, diabetes is detected in about 18-20% of cases; ... the presence of CD-2 increases the risk of developing cognitive impairment and dementia by up to 40% [14].

Modern guidelines also emphasize that in MS, the prognosis is unfavorable if the patient does not change his lifestyle and, in case of insufficient effectiveness of non-drug treatment methods, drug correction of the components of MS risk factors for CVD and DM-2 is not performed [10].

E.V. Shlyakhto, E.I. Baranova (2019) note that the prevalence of MS in the population is high and progressively increases with age. A quarter of the adult population of Europe and Latin America and 37% of the US population aged 44-84 have MS. The prevalence of MS in the population studied by these authors in Russia is 21% and in Asian countries - 18% [10]. We consider it quite logical to agree with the conclusions of the researchers of this work that it is difficult to establish the true frequency of MS - this requires and / or requires large-scale epidemiological studies.

A similar content of the recommendation is set out in modern research monographs and scientific works of large scientific centers for preventive medicine [15, 21, 27, 48].

In the study of O.V. Grezdova et al. (2017) included women and men (n = 2308) aged 21 to 70 and older. Among metabolic risk factors for CVD, the frequency of occurrence was

analyzed in all age groups of diabetes, AO, HCS and AH (MS components). There was a sharp decrease in the number of patients in the population, in older age groups, from CVD RF (MS components) - to 1.4%. It was shown that with age, the cumulative effect of the combined action of the noted MS components increases.

This effect is realized at an older age with the development of critical conditions in the form of myocardial infarction and stroke [7].

V.I. Podzolkov (2014) analyzing large-scale studies from the standpoint of evidence-based medicine confirms the widespread opinion that the “main component” of MS-hypertension is a disease of the “autumn of human life” and a sign of normal aging. The author presents substantiated scientific data that the problem of hypertension as a component of MS in old age is somewhat relevant for modern cardiology: according to the UN forecast by 2050. The number of people over 60 years old in Russia will be about 33%, and 80 years old and older - 6.6% of the total population of the country · an increase in the total life expectancy in the modern era is accompanied by an increase in the number of elderly (60-70 years old according to WHO classification 1998) and senile (75-90 years old) age; · prevalence of hypertension in these categories is, according to different studies, 50-80%; · every tenth patient with hypertension in Russia has isolated systolic hypertension, and the proportion of these patients in old age increases 20% [17].

From the literature it follows that another component of MS-obesity is also a serious medical, social and economic problem of modern society. As a result of large studies, an important conclusion was made: with an

increase in body mass index of more than 30 kg / mg<sup>2</sup>, overall mortality and mortality from CVD significantly increase [8]. The significance of the obesity problem is determined by a decrease in the overall life expectancy due to the frequent development of severe concomitant diseases. Every year 2.8 million adults die due to BMI or obesity in 44% of cases of diabetes, 23% of cases of coronary artery disease and up to 41% of cases of cancer with these components of MS. It is noted that an increase in body weight by 1 kg increases the risk of developing CVD by 3.1%, and diabetes-2 - by 4.5-9% [6].

It must be emphasized that more than 280 years have passed since the moment when the English monk Stephen Hales (1733) first measured the blood pressure of a horse by a direct method. At the beginning of the twentieth century (1905), the Russian surgeon NS Korotkov reported about a non-invasive method for measuring blood pressure, which later received his name [4]. Consequently, AH (the main component of MS) is one of the most studied therapeutic diseases, at the same time, despite this, until now, many problems associated with it, for example, in the composition of the metabolic syndrome in elderly people, remain unresolved. There are significant differences in prevalence of hypertension in different countries and age groups. Thus, according to the WHO, the prevalence of high blood pressure worldwide in 2014 is 29.2% in men and 24.8% in women [48]. According to European representatives, the prevalence of hypertension is in the range of 30-45%, in the general population, with a sharp increase in the number of aging [34]. At the same time, the true prevalence of hypertension is unknown, since it is still unclear how to identify the initial stages of this disease

and/or the debate about which blood pressure should be considered normal does not subside. The increased risk of CVD development in persons with blood pressure exceeding 115 and 75 mm Hg, indicates that the final point in the question of the rate of blood pressure puts early [4,22,47].

### CONCLUSIONS

Thus, hypertension as an independent RF of CVD and as part of the metabolic syndrome remains one of the most mysterious and common diseases. New, first of all, population approaches to the study of its pathogenesis, clinical manifestations and prevention are needed, which will reduce mortality from CVD / CND / MS and increase the life expectancy of many people / patients of elderly and senile age [41,43,44].

### REFERENCES

1. Aronov D.M. Physical training programs for the prevention of cardiovascular complications in apparently healthy people with various risk factors for coronary artery disease. Methodical recommendations // Preventive medicine.-2014.-17(3):63-65.
2. Belenkov Yu.N., Chazova I.E., Mychki V.B. Multicenter randomized open-label study to study the effectiveness of lifestyle changes and therapy with ACE inhibitors (quinapril) in patients with obesity and arterial hypertension (IVF) // Art. hypert. 2003; 9(6): 196-8.
3. Boytsov S.A., Chuchalina A.G. Prevention of chronic non-communicable diseases. A practical guide. M.: GNITsPM.-2013.
4. Bokarev I.N., Dunin P.A., Ovchinnikov Yu.V. Arterial hypertension: current

- state of the problem // Clinical medicine.-2017-Vol. 95.-№7-P.581-585.
5. Bganyan R.A., Kalinina A.M., Karamnova N.S., Ipatov P.V. et al. Methodological aspects of identifying and correcting alimentary-dependent risk factors for cardiovascular diseases in the course of clinical examination of certain groups of the adult population of Russia // Preventive Medicine.-2015.-№1.-P.3.
  6. Verbovoy A.F., Pashentseva A.V., Sharapova L.L. Obesity and the cardiovascular system // Clinical medicine -2017.-95 (1).-№1.-P.31-34.
  7. Gruzdeva O.V., Palicheva E.I., Maksimov S.A. et al. Metabolic risk factors for the development of diseases of the circulatory system in different age groups // Clinical recommendation:-2017.- Vol 95.-№11.-P.1035-1040.
  8. Kobyakova O.S., Kulikov E.S., Deev I.A., Almikeeva A.A., et al. The frequency of risk factors for chronic non-infectious diseases among doctors in the Russian Federation on the model of the Tomsk region // Cardiovascular therapy and prevention.-2018:17(6).-P.-44-50.
  9. Karpov Yu.A., Shubina A.T. Reducing the risk of complications in metabolic syndrome: the role of a fixed combination of losartan and amlodipine // Atmosphere. Cardiology news. -2016.-№3.-P. 29-34.
  10. Cardiology. National leadership. 2nd edition, revised and enlarged // Edited by Academician E.V. Shlyakhto.-Moscow.-2019-P.391.
  11. Casio Tushita. Measures to prevent visceral obesity and cardiovascular risk factors: the essence and results of a

- lifestyle change program aimed at combating metabolic syndrome in Japan // VII International Internet Congress of Specialists in Internal Medicine. - Moscow.-VIDOX -2018.-P.9-10.
12. Korneeva O.N., Drapkina O.M., Ivashkin V.T. Clinical variants of metabolic syndrome -2007.
  13. Mamedov M.N. Metabolic syndrome in Russia: prevalence, clinical features and treatment. Moscow: News of the Administrative Department of the President of the Russian Federation. - 2011.
  14. Mohort T.V., Mohort E.G. Cognitive impairments and diabetes mellitus: prevention and treatment options // Health of Uzbekistan. -2016-№(04)-P.66-67.
  15. Ochanov R.G., Kalinina A.M., Pozdnyakov Yu.M. Preventive cardiology. -Moscow -2003.-P.33-36.
  16. The first results of the Russian program "April" (The effectiveness of the use of acarbose in patients with impaired glucose tolerance and arterial hypertension // Obese metabolic 2005; 1(3): 13-1.
  17. Popov V.V., Novikova I.A., Prokhova M.V., Litvyakova M.L. and others. Early diagnosis and prevention of age-associated disorders in elderly and senile people living in the European North of Russia // Preventive Medicine.- 2019-№3-P.77.
  18. Prevention of chronic non-communicable diseases. Russian recommendations // Ed. Boitsova S.A.- Moscow -2013-P.75-76.
  19. Strazheeko I.D., Akasheva D.U., Dudinskaya E.N., Tkacheva O.N. Aging of blood vessels: main signs and mechanisms // Cardiovascular therapy and prevention -2012; 11(4): 95-99.
  20. Shubina A.L., Demidova I.Yu., Karpov Yu.A. metabolic syndrome X: prerequisites for the development of arterial hypertension and atherosclerosis // Clinical Pharmacology and Therapy.- 2001;10(4):45-46.
  21. Shapiro I.A. Secondary prevention of cardiovascular diseases at the level of outpatient clinics in the context of health care reforms // Author. doct. diss.-M.-2002.
  22. Degtyarev V.A. On the question of determining blood pressure by auscultatory method // Functional diagnostics -2007;(2): 6-10.
  23. Diagnosis and treatment of metabolic syndrome. Russian recommendations. –Moscow // Appendix 2 to the journal "Cardiovascular Therapy and Prevention" 6/6.-P.4-5.
  24. Drapkina O.M. Metabolic syndrome: cardiovascular and gastroenterological comorbidity // III International Internet Congress of Specialists in Internal Medicine - Moscow.VIDOX-2018.
  25. Chazova I.E., Mychka V.B. Metabolic syndrome. M:Media Medica.2004-P.48-49.
  26. Chazova I.E., Mychka V.B. Multicenter, randomized, scientific and practical program MINOTAVR: intermediate analysis of the results // Kardiovask. ter. profile 2006; 2:81-6.
  27. Alwan A. The World Report of Non communicable Diseases // WHO library Cataloguing in Publication Data: General, 2013- P. 161.

28. Bykov A.T. , Malyarenko T.N. , Dynrhykov A.A. et al. About efficacy of the training exercises in rehabilitation of the patients undergoing surgical myocardial revascularization // Medical Bulletin of the South of Russia.-2012; 3:7-15.
29. Borch – Sohnsen K., Wareham N. The risk and fall of the metabolic syndrome // Diabetologia. -2010;53(4):597-598
30. <https://www.who.int/Features/Factfiles/ageing/ru/index.html>.
31. Franklin S.S. Do Diabetes and hypertension interact to accelerate vascular ageing? // J Hypertens 2002 ; 20(9) : 1699-1664.
32. Gandhi H.K., Vaishali V., frem R. et al A survey on physical activity and noncommunicable disease risk factors among physicians in tertiary care hospitals, Mangalor. //Nat J Commun Med.2012; 3(1):7-12.
33. Hanefeld M., Pirosh F., Schulze J.et al. The metabolic syndrome and cardiovascular diseases: an update of medical treatment //J Metabolic Synd 2014; 3(4): 160-165.
34. 2003 European Society of Hypertension – European Society Cardiology Guidelines for the management of arterial hypertension // J Hypertens-2003; 21:1011-52.
35. Kynene Sh, Taukobong NP. Dietary habits among health professionals working in a district hospital in Kwazulu-Natal, South Africa // Afr J prim Health Care Fam Med. 2017;9(1): 1364.doi:10.4102/phefm. V9:1.1364.
36. Mazzali M., Kanellis J., Han L. et al. Hyperuricemia induces a primary renal arteriopathy in rats 64-nism // Am J Physiol Renal Physiol .2002;282:f 991-
37. Milions H., KaKafika A. Effects of Statin Treatment on Uric Acid Homeostasis in Patients with Primary Hyperlipidemia //Am Heart J 2004; 148 (4):636-39.
38. Nilsson P.M. Hemodynamic aging as the consequence of structural changes associated with Early Vascular Aging (EVA) //Aging Dis 2014; 5(2):110-112.
39. Nilsson P.M., Lurbe E., Lanrent S. The early life origins of vascular ageing and cardiovascular ageing risk: the EVA syndrome //Hypertens 2008; 26(6):1049-1055.
40. Makladalona M., Sovova E., Ivanova K. et al Risk Factors For cardiovascular diseases in physicians //J.Blomed.Pap.Med.Fac.Univ.
41. Oganov R.G., Maslennikova C.V., Tyurina T.V. et al. How to help smoking patients : new opportunities // Кардиоваскулярная терапию -2011-10(5). –С.4-6.
42. Paulweber B., Valensi P., Kindsfrom J. European Evidence-Based Guideline for the Prevention of Type 2 Diabetes // Horm and Metab Research 2010 ; 42(suppl.1) : 3-31.
43. Seobodyanyuk A.L., Krylova J.A., Kyraev V.I. Primary care : now to increase physical activity in your patients // Archives of Internal Medicine -2019;9(4) : 269-279. Doi : 10-20514 / 2226-6704-2019.9-4-269-279.
44. Standatr FC, Durkin MN,Blair SN. Determining levels of physical activity in attending physicians , resident and fellow Physicians and fellow physicians and medi physicians resident and fellow physicians and medical students in the USA // Br J Sports Med . -2010; 46(5) : 360.4. doi : 10.1136//bisports -2011-090299.

45. Verdecchial P., Schillaci G., Reboldi G. et al. Relation between serum uric acid and risk of cardiovascular disease in essential hypertension // The PIUMA study. Hypertension 200; 36 : 1073-8.
46. Ryden L., Grant P.I., Ankon S.D., BerneC., Cosentino F., Danchin N. et al. ESC Guidelines on diabetes, prediabetes, and cardiovascular diseases developed in collaboration with the EASD : The Task Force on diabetes, pre-diabetes, and cardiovascular diseases of the European society of Cardiology (ESC) and developed in collaboration with the European Association for the dtudy of Diabetes [EASD] // Eur Heart J 2013; 34 (39) : 3035-3085.
47. World Health Statistics 2014. World Health Organization.
48. Zimmed P., Shaw J., Alberti G. Preventing type 2 diabetes and the dysmetabolic syndrome in the world : a realistic view. Diabetic medicine 2003; 20(9) : 693-701.