

Estimation of the cardiovascular morbidity in the population of the Kabardino-Balkarian Republic according to the number of visits to health care offices

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Abstract

The aim is to evaluate the level, structure and dynamics of cardiovascular morbidity in the Kabardino-Balkarian Republic for the period from 2014 to 2019. The article describes the structure and dynamics of the general and primary morbidity of the adult population according to the main classes of diseases, the level, structure and dynamics of the general and primary morbidity of the circulatory system diseases from 2014 to 2019. The high prevalence of cerebrovascular disease and arterial hypertension, increase in new cases of acute myocardial infarction, postinfarction cardiosclerosis, cerebral infarction, intracerebral and other intracranial hemorrhage, the effects of cerebrovascular disease on the background of reducing the chronic forms of ischemic heart disease and arterial hypertension primary morbidity. The critical analysis of official statistics as a basis for management decisions is given. Scientific novelty of the work lies in the substantiation of reasonability of clinical and epidemiological research for the planning of preventive measures in the health-care system. As a result, reasonability of the clinical and epidemiological research and the need to implement additional preventive measures is substantiated.

Keywords

Morbidity, Circulatory system diseases, Cerebrovascular disease, Ischemic heart disease, Arterial hypertension

Imprint

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Introduction

The cardiovascular diseases (CVD) are recognized by the international community as a challenge reaching a pandemic level. The epidemiological situation with the CVD cases in Russia is tighter as it is the case with other countries in the world that is evidenced by higher rates of morbidity and mortality from CVD, younger age of death caused by the CVD cases resulting in a decline in life expectancy. The existing unfavorable health care situation, of course, requires stronger attention to be paid to this problem [1,2,3]. No doubt that prevention, treatment and rehabilitation of the CVD patients are the most important components of maintaining the active longevity, saving labor potential and minimizing the social and economic burden caused by disability [1,4]. However, there are significant differences in the morbidity and mortality from CVD reported in some regions of the country. Therefore, it is important to analyze the existing epidemiological situation for the subsequent implementation of preventive programs adapted to the actual needs of the region.

The aim of the study is to estimate the level, structure and dynamics of the cardiovascular morbidity in the Kabardino-Balkarian Republic (KBR) within the period from 2014 to 2019.

Materials and methods

The study was conducted in the KBR, covering an area of 12 470 km² with a population of 868 350 people as of January, 1, 2019. The region is divided into 3 urban districts and 10 municipal entities. The density of population in the Republic was 69.3 people per km² with 52% of the urban population as of January 1, 2019 [5].

For our analysis we used data of State Health Care Institution "Medical Information and Analytical Center" at the KBR Ministry of Health Care. Morbidity rates were analyzed with descriptive statistics methods.

Results and discussion

In 2019 the rate of total morbidity was 86515.9 per 100 thousand population, the rate of the primary dis-

Table 1

Dynamics of total and primary morbidity of the KBR population in 2014–2019 per 100 thousand adult population

Rates per 100 thousand	Year						
	territory	2014	2015	2016	2017	2018	2019
Total morbidity	RF	145477.3	144795.4	146341.7	146691.9	148941.1	150540.5
	NCFD	115666.6	114768.0	117905.4	119822.7	117515.2	119865.7
	KBR	106933.0	91035.5	90474.3	87609.2	87944.9	86515.9
Primary morbidity	RF	55259.5	54780.2	55227.3	54503.2	54734.2	54834.8
	NCFD	50585.0	50248.0	49381.2	49631.8	47712.2	48965.2
	KBR	31762.8	31647.8	30183.8	29867.1	30266.9	27647.5

Note: NCFD - the North Caucasian Federal District, RF - Russian Federation, KBR - the Kabardino-Balkarian Republic

Table 2

The structure of total and primary morbidity of the adult population according to the main classes of diseases in the KBR in 2019

Classes and groups of diseases	Morbidity per 100,000 adult population	
	Total	Primary
Sum-total	86515.9	27647.5
Certain infectious and parasitic diseases	1079.1	256.5
Neoplasms	3562.8	595.9
Diseases of blood, blood-forming organs and certain disorders involving the immune mechanism	424.9	77.6
Endocrine, nutritional and metabolic disorders	5470.1	631.5
Mental and behavioral disorders	3007.8	224.3
Nervous system diseases	4163.0	768.8
Diseases of the eye and adventitious apparatus	4181.2	1105.8
Diseases of the ear and mastoid	2695.4	1447.1
Circulatory system diseases	13771.8	1998.0
Respiratory diseases	12747.2	8386.7
Respiratory diseases	10350.6	1700.7
Diseases of the skin and subcutaneous tissue	2480.2	1728.9
Diseases of the musculoskeletal system and connective tissue	5580.0	814.1
Diseases of the genitourinary system	10359.4	2220.8
Pregnancy, childbirth and the postnatal period	7400.6	4409.7
Congenital anomalies (malformations), deformations and chromosomal abnormalities	29.9	1.5
Injuries, poisoning and other consequences of external causes	4326.8	4328.6

Note: NCFD - the North Caucasian Federal District, RF - Russian Federation, KBR - the Kabardino-Balkarian Republic

ease 27647.5 per 100 thousand population (Table 1). In 2019, as compared with 2015, there was a decrease in the total morbidity by 5.0%, and primary by 12.6%, and when comparing 2019 with 2014, registered has been a decrease in the total morbidity by 19% and the primary by 13%. During the analyzed period the rates of total and primary morbidity in the KBR were lower than in the NCFD and RF, and decrease, in contrast to the NCFD and RF, where the morbidity increases (Table 1).

Such a difference can be caused by both the objective, related to the prevalence of various diseases, and the subjective, substantiated by the criteria of disease assessment and case management system, reasons. When analyzing the dynamics of morbidity it is also necessary to take into account that these rates are formed on the basis of the population appealability to

public health facilities, where all cases are subject to registration and further accounting. Cases of appealability to the private health care institutions are not registered.

In 2019 the rate of the CSD total morbidity was 13771.8 per 100 thousand population, the primary morbidity 1998.0 per 100 thousand population (Table 2). In the structure of the total morbidity the traditional leader is the CSD, 16% in 2019. It is noteworthy that the diseases, which occupy the first three positions in the structure of morbidity (CSD, respiratory and digestive system diseases), are 42.6% of all diseases.

The CSD primary morbidity rate in 2019 in the KBR was 1998.0 per 100 thousand population. (2014 - 2503.4, a 505.4 decrease during 6 years). CBVDA-mong nosologic units the first place was occupied by the diseases characterized by the elevated blood pres-

Table 3

The dynamics of the CSD primary morbidity in the KBR adult population for the period from 2014 to 2019 (per 100 thousand population)

Classes of diseases	Territory	Year					
		2014	2015	2016	2017	2018	2019
Circulatory system diseases (I00-I99)	RF	3357.5	3663.0	3754.0	3810.6	3897.3	4205.1
	NCFD	4138.1	4343.5	3913.1	3651.0	3505.6	3895.6
	KBR	2503.4	2330.6	2424.9	1950.9	1828.2	1998.0
Diseases characterized by high blood pressure (I10-I15)	RF	846.5	1105.7	1182.4	1201.3	1309.3	1472.2
	NCFD	1096.2	1163.0	1157.4	881.0	1219.0	1326.4
	KBR	858.6	827.5	861.6	779.4	620.1	767.8
Ischemic heart disease (I20-I25)	RF	834.7	911.0	876.0	918.9	893.2	932.4
	NCFD	1313.0	1394.5	1045.7	929.0	807.7	896.0
	KBR	448.7	481.8	459.2	367.0	366.2	388.2
Angina pectoris (I20)	RF	380.9	368.7	334.0	360.2	357.3	354.6
	NCFD	843.4	734.0	526.9	390.4	409.2	477.8
	KBR	131.5	109.7	99.5	103.4	62.3	111.1
Unstable angina (I20.0)	RF	138.14	169.20	149.1	168.4	149.9	143.0
	NCFD	207.39	263.70	210.9	221.2	224.1	227.6
	KBR	30.48	108.67	60.1	72.1	59.3	45.5
Acute myocardial infarction (I21)	RF	129.3	135.4	135.5	135.3	138.2	141.3
	NCFD	83.3	95.7	85	90.3	98.9	105.7
	KBR	44.7	74.5	67.7	133.3	162.1	131.7
Recurrent myocardial infarction (I22)	RF	25.07	24.47	24.04	23.13	21.7	19.6
	NCFD	16.02	17.59	17.56	17.25	13.9	10.6
	KBR	5.49	12.80	11.26	21.13	6.1	0.5
Other forms of acute ischemic heart disease (I24)	RF	11.59	16.98	17.12	14.77	14.8	13.9
	NCFD	25.82	30.51	18.61	11.83	10.8	12.2
	KBR	28.81	29.57	13.85	10.95	4.9	8.9
Chronic ischemic heart disease (I25)	RF	261.7	333.8	344.4	359.5	347.5	384.5
	NCFD	313.3	309.1	290.5	209.7	255.0	272.6
	KBR	211.6	196.0	188.3	98.2	130.8	136.0
Postinfarction cardiosclerosis (I25.2)	RF	81.5	93.2	90.4	93.6	96.8	102.2
	NCFD	39.3	57.5	48.3	43.8	69.5	66.9
	KBR	29.9	69.8	76.3	57.9	104.7	46.5
Cerebrovascular diseases (I60-69)	RF	822.3	901.6	949.0	947.8	973.0	995.8
	NCFD	835.7	916.4	817.0	865.6	889.0	714.7
	KBR	751.7	649.6	533.1	473.9	658.2	552.2
Subarachnoid hemorrhage (I60)	RF	10.80	13.67	188.3	98.2	13.9	10.7
	NCFD	34.72	63.01	27.49	28.19	15.2	14.0
	KBR	14.63	15.09	15.22	10.64	10.2	8.8
Intracerebral and other intracranial hemorrhage (I61-I62)	RF	38.96	42.74	42.38	44.20	43.2	41.3
	NCFD	44.11	41.04	34.63	55.35	35.4	34.2
	KBR	19.51	30.79	20.85	32.69	41.4	34.3
Cerebral infarction (I63)	RF	225.9	259.2	266.9	277.8	288.1	299.7
	NCFD	164.1	208.4	190.6	216.7	227.0	205.8
	KBR	50.8	168.4	168.3	211.5	225.7	242.7
Stroke, not clarified as hemorrhage or infarction (I64)	RF	46.59	39.37	31.73	29.00	25.1	21.6
	NCFD	65.86	55.88	50.67	50.23	15.0	18.4
	KBR	15.09	30.64	8.83	8.51	2.9	0.6
Other cerebrovascular diseases (I67)	RF	407.0	452.8	509.3	503.0	517.2	549.0
	NCFD	412.2	405.1	398.5	397.7	379.9	357.6
	KBR	633.1	381.0	308.8	154.9	349.9	229.9
Occlusion and stenosis of precerebral, cerebral arteries, not resulting in cerebral infarction	RF	14.68	15.27	15.93	18.60	14.6	16.0
	NCFD	16.73	16.29	9.93	11.41	8.0	8.7
	KBR	18.59	10.06	6.24	6.08	10.5	11.7
Consequences of cerebrovascular diseases (I69)	RF	78.4	78.6	65.8	56.8	60.4	57.5
	NCFD	97.9	126.7	86.5	105.3	96.9	75.9
	KBR	-	13.6	4.9	49.6	17.6	24.3

Note: NCFD - the North Caucasian Federal District, RF - Russian Federation, KBR - the Kabardino-Balkarian Republic

Table 4

The dynamics of the CSD total morbidity in the KBR adult population for the period from 2014 to 2019 (per 100 thousand population)

Classes of diseases	Territory	Year					
		2014	2015	2016	2017	2018	2019
Circulatory system diseases (I00-I99)	RF	28247.4	28251.7	28897.8	29629.5	30698.5	31949.8
	NCFD	18936.9	18227.7	19049.2	19183.8	19871.1	20574.6
	KBR	19905.3	14574.5	13460.2	12829.9	13670.9	13771.8
Diseases characterized by high blood pressure (I10-I15)	RF	11280.8	11797.4	12358.4	12949.3	13810.0	14647.1
	NCFD	7380.4	7588.5	8105.4	7556.2	8810.5	8640.0
	KBR	9528.5	7318.0	6858.3	5971.8	6847.5	6313.4
Ischemic heart disease (I20-I25)	RF	6489.0	6425.2	6507.5	6622.3	6696.8	6902.7
	NCFD	4784.3	4565.5	4717.9	4853.4	4727.4	5373.7
	KBR	4134.9	2602.1	2572.9	2505.5	2588.3	2544.7
Angina pectoris (I20)	RF	2435.7	2384.3	2370.6	2410.7	2412.4	2431.0
	NCFD	1827.5	1854.6	1739.3	2104.2	1926.7	2134.9
	KBR	1429.2	1054.9	988.5	1018.4	1052.8	1052.6
Unstable angina (I20.0)	RF	138.14	169.30	149.07	168.42	149.9	143.0
	NCFD	207.39	263.70	210.85	221.25	224.1	227.6
	KBR	30.48	108.67	60.12	72.07	59.3	45.5
Acute myocardial infarction (I21)	RF	129.3	135.4	135.5	135.3	138.2	141.3
	NCFD	83.3	95.7	85.0	90.3	98.9	105.7
	KBR	44.7	74.5	67.7	133.3	162.1	131.7
Recurrent myocardial infarction (I22)	RF	25.07	24.47	24.0	23.1	21.7	19.6
	NCFD	16.02	17.59	17.6	17.3	13.9	10.6
	KBR	5.49	12.80	11.3	21.1	6.1	0.5
Other forms of acute ischemic heart disease (I24)	RF	22.78	19.49	17.1	14.8	14.8	13.9
	NCFD	45.49	46.10	18.6	11.8	10.8	12.2
	KBR	40.24	29.57	13.8	10.9	4.9	8.9
Chronic ischemic heart disease (I25)	RF	3757.8	3771.2	3862.1	3975.5	4036.6	4202.6
	NCFD	2367.6	2250.5	2419.9	2582.6	2437.4	2596.2
	KBR	2443.1	1174.4	1277.5	1321.7	1362.4	1331.3
Postinfarction cardiosclerosis (I25.2)	RF	618.5	661.9	701.9	719.1	741.8	782.5
	NCFD	377.1	368.5	420.3	383.2	426.3	459.6
	KBR	383.2	402.1	361.5	414.0	412.6	429.3
Cerebrovascular diseases (I60-69)	RF	6105.3	6030.2	5968.8	6035.4	6173.6	6262.2
	NCFD	2687.3	2913.8	3086.5	3245.0	3307.0	3414.9
	KBR	3157.9	2353.5	2044.3	2475.6	2767.3	2776.5
Subarachnoid hemorrhage (I60)	RF	10.80	13.67	11.7	14.1	13.9	10.7
	NCFD	34.72	63.01	27.5	28.2	15.2	14.0
	KBR	14.63	15.09	15.2	10.6	10.2	8.8
Intracerebral and other intracranial hemorrhage (I61-I62)	RF	38.96	42.74	42.4	44.2	43.2	41.3
	NCFD	44.11	41.04	34.6	55.3	35.4	34.2
	KBR	19.51	30.79	20.9	32.7	41.4	34.3
Cerebral infarction (I63)	RF	225.9	259.2	266.9	277.8	288.1	299.7
	NCFD	164.1	208.4	190.6	216.7	227.0	205.8
	KBR	50.8	168.4	168.3	211.5	225.7	242.7
Stroke, not clarified as hemorrhage or infarction (I64)	RF	46.6	39.4	31.7	29.0	25.1	21.6
	NCFD	65.9	55.9	50.7	50.2	15.0	18.4
	KBR	15.1	30.6	8.8	8.5	2.9	0.6
Other cerebrovascular diseases (I67)	RF	5688.1	5578.7	5500.3	5566.0	5688.0	5802.5
	NCFD	2263.8	2398.8	2576.8	2712.0	2673.3	3014.4
	KBR	3039.3	2058.1	1808.1	2141.1	2448.0	2440.6
Occlusion and stenosis of precerebral, cerebral arteries, not resulting in cerebral infarction	RF	16.49	17.89	21.98	26.45	24.0	28.9
	NCFD	16.76	20.07	13.85	13.49	15.7	52.1
	KBR	18.59	36.88	18.11	21.59	21.5	25.3
Consequences of cerebrovascular diseases (I69)	RF	78.4	78.6	65.8	56.8	60.4	57.5
	NCFD	97.9	126.7	86.5	105.3	96.9	75.9
		-	13.6	4.9	49.6	17.6	24.3

Note: NCFD - the North Caucasian Federal District, RF - Russian Federation, KBR - the Kabardino-Balkarian Republic

sure (767.8 per 100 thousand population), the second place, by the cerebrovascular disease (CBVD, 552.2 per 100 thousand), the third by the ischemic heart disease (IHD, 388.2 per 100 thousand). The high arterial hypertension (AH), CBVD and IHD morbidity should be taken into account when designing specific measures aimed at improving the management of these patients cohorts and preventing the diseases.

Analysis of the dynamics of the primary and total morbidity (Table 3,4) in separate CSD showed an increase of newly diagnosed cases of acute myocardial infarction, postinfarction cardiosclerosis, cerebral infarction, intracerebral and other intracranial hemorrhage, CBVD consequences due to lower primary morbidity in chronic IHD, high blood pressure diseases, which should be considered in the planning of primary and secondary prevention of CSD. The highest rates of myocardial infarction, intracerebral and other intracranial hemorrhage occurred in 2018 with a slight decrease in 2019. Reducing the morbidity of stroke, not clarified as hemorrhage or infarction, occurred due to the improvement in the provision of specialized medical care at the stage of the hospital (widespread use of computed tomography, magnetic resonance imaging), which was achieved during the implementation of the regional program "Fight against cardiovascular disease in the Kabardino-Balkarian Republic" and the organization of specialized medical care to patients with disorders of cerebral circulation in accordance with the order of Ministry of health of the Russian Federation No. 928-n, 2012 "Provision of specialized medical care in acute cerebral circulatory disorders". A source of concern is the decrease in the primary and total morbidity of the diseases characterized by high blood pressure, with an increase in the morbidity of acute forms of IHD and CBVD, development and destabilization of which are pathogenetically associated with AH.

Our study has some limitations. They consist in the fact that the study uses the data of official health-care statistics, which only with certain restrictions can identify the problems which require efforts of the health-care system and other services for the planning of preventive work. When analyzing the results, relying only on official statistics, we failed at identifying the factors influencing the level and dynamics of disease. The reasons could be both objective, related to the prevalence of various diseases, and subjective, substantiated by the criteria of disease assessment

and case management system. The rates of morbidity in the RF are formed on the basis of the population appealability to public health facilities, where all cases are subject to registration and further accounting. Cases of appealability to the private health care institutions are not registered. Therefore, the results of our study allowed us just to highlight the range of possible factors affecting the level and dynamics of disease. To estimate the true prevalence of diseases it is necessary to carry out simultaneous clinical and epidemiological studies in representative population samples with well-validated methods of examination and diagnostic criteria. Experience in the use of such studies results for prediction of health-care costs is accumulated in several countries [6]. Experience in the implementation of cross-sectional clinical and epidemiological studies exists both in the KBR and other regions of Russia [1,4,7]. However, it is not the rule in Russia to use these studies results in official reports on the health status of the population and in the planning of resource provision of medical care. However, it is known that the prevalence of one and the same disease is largely dependent on the studied sample, criteria and methods of evaluation. These factors should be considered when planning health care, especially expensive health care.

Conclusion

The CVD morbidity rates in the KBR are found to be below the national average level as well as below the NCFD rates, and they show their further tendency to decline. The implementation of the regional program "CVD control in the Kabardino-Balkarian Republic" has significantly improved the quality of rendering specialized medical service to the local population. However, the high prevalence of CBVD and AH, the growth of new cases of acute myocardial infarction, postinfarction cardiosclerosis, cerebral infarction, intracerebral and other intracranial hemorrhages, the consequences of CBVD against the background of lower primary case morbidity of chronic forms of ischemic heart disease, diseases characterized by high blood pressure, require the development and implementation of some additional measures for the early detection, primary and secondary prevention of CVDs focusing on the identification and control of AH. To optimize approaches to assessing the morbidity rate and prevalence of CVD, it is advisable to conduct an epidemiological study in the KBR, the results of which

will allow us to identify the real prevalence of CVD and properly target the operation of health care facilities.

Statement on ethical issues

Research involving people and/or animals is in full compliance with current national and international ethical standards.

Conflict of interest

None declared.

Author contributions

The authors read the ICMJE criteria for authorship and approved the final manuscript.

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