

NATIONAL TRENDS IN MORBIDITY AND MORTALITY FROM CIRCULATORY SYSTEM AND CEREBROVASCULAR DISEASES AND STROKES

DOI: 10.36740/WLek202205118

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ABSTRACT

The aim: To determine national trends in morbidity and mortality from diseases of the circulatory system, cerebrovascular diseases and strokes.

Materials and methods: Data from official sources of statistical information of Ukraine were used and systematic analysis and generalization of the obtained data was performed and trends in morbidity and mortality from diseases of the circulatory system, cerebrovascular diseases and strokes in Ukraine were calculated.

Results: Were found tendencies to decrease of national levels of prevalence and primary morbidity in Ukraine for DCS (-16.3 % and -28.0 %), CVD (-22.8 % and 24.1 %) and strokes (-12.2 %) with significant trends (+83.9 %) of increase in primary incidence of strokes in 2010-2017 with fairly high and threatening levels for 2017 (respectively 22199563, 2521601 and 96978 – prevalence and 1725137, 290557 and 96978 – primary incidence). National levels of reduction of deaths from DCS in Ukraine from 440369 (2013) to 389348 (2019) with a trend of -11.6 % and a decrease in mortality due to CVD from 94267 (2013) to 76232 (2019) with a trend -19.1 % were found.

Conclusions: The trends to reduce of national prevalence, primary morbidity and mortality rates in Ukraine for DCS, CVD and stroke are fully consistent with other global trends of reduction of these levels among world countries.

KEY WORDS: diseases of the circulatory system, cerebrovascular diseases, strokes, prevalence, primary morbidity, mortality, trend

Wiad Lek. 2022;75(5 p1):1153-1156

INTRODUCTION

The WHO points to the high importance of cardiovascular diseases for humanity due to the significant levels of prevalence and mortality due to these diseases. Thus, it is estimated that about 18 million patients worldwide die prematurely from cardiovascular disease each year [1], most due to coronary heart disease and stroke (15.2 million premature deaths in 2016) [2]. According to other data, the global annual mortality due to strokes is more than 6.7 million patients (about 11.9 % of total global mortality) [3, 4].

According to world researchs, the problem of strokes is very relevant due to the high medical and social importance of these diseases, which is provoked by their high prevalence; constant growth; high levels of morbidity and mortality and the need for such patients to carry out many medical, rehabilitation and social measures [5-9]. According to WHO definitions and global research and meta-analysis, stroke is the second most common after coronary artery disease cause of disability and mortality in the world and in Ukraine [10]. According to the WHO [11] and Norrvig B. et al. [12] the global incidence of stroke is differs in different countries: in Europe, annual prevalence rates are more than 1.2 million cases with a 2-3-fold increase in Eastern Europe compared to Western Europe. According to Kissela B. M. et al. [13], up to 30

million new cases of stroke occur worldwide each year: in economically developed countries (European Union, Iceland, Switzerland, Norway) about 1.1 million, in the United States more than 550 thousand. It is stated that of all new cases of stroke, about 40 % end with death in the first month, 50 % — in the first year; and 20–40 % of patients become completely dependent on outside help and only 10 % have complete recovery of their functions.

According to WHO experts, the global incidence of stroke will continue to increase due to global aging and increasing risk factors for their development (heart disease, hypertension, diabetes, dyslipidemia, hypercholesterolemia [14], hypodynamia, malnutrition, alcohol abuse, chronic stress, smoking and others) and by 2035 will increase by 34.0 % among European countries [4].

In Ukraine, according to the WHO, the prevalence of stroke also has a negative trend [15]. According to official statistics, up to 150,000 new cases of stroke and about 40,000 to 45,000 deaths are registered in Ukraine each year. It is known from official sources that the prevalence of strokes in Ukraine is 30.0 % higher than the European average and has 280-290 new cases per 100 thousand population (100-120 thousand diseases). Mortality in Ukraine due to stroke is at 30.00-40.00 % in the first 30 days and up to 50.00 % in the first year after stroke.

Table I. Prevalence and primary incidence of DCS, CVD and stroke among adults (18 years and older) in Ukraine in 2010-2017 (excluding the temporarily occupied territory of the Autonomous Republic of Crimea and Donetsk and Luhansk regions) (n)

Year	Number of cases					
	DCS		CVD		Stroke	
	Total	Primary	Total	Primary	Total	Primary
2010	26523102	2397059	3268100	382916	110421	52739
2011	109329	28191	3192923	361974	110753	110753
2012	26231358	2234607	3170428	351436	111615	111615
2013	26200923	2176805	3122985	348881	111953	111953
2014	22354901	1813572	2557591	308256	94104	94104
2015	22381985	1779828	2551645	298854	96319	96319
2016	22303564	1766188	2528013	299734	97805	97805
2017	22199563	1725137	2521601	290557	96978	96978
Trend	-16,3	-28,0	-22,8	-24,1	-12,2	+83,9

Table II. Mortality from DCS and CVD among the adult (18 years and older) population of Ukraine in 2013-2019, excluding the temporarily occupied territory of the Autonomous Republic of Crimea and Donetsk and Luhansk regions (abs., Per 100 thousand)

Year	Number of deaths											
	DCS						CVD					
	Total		Urban		Rural i		Total		Urban		Rural	
	n	Per 100 thousand	n	Per 100 thousand	n	Per 100 thousand	n	Per 100 thousand	n	Per 100 thousand	n	Per 100 thousand
2013	440369	970,6	266287	855,6	174082	1221,655	94267	207,8	66121	212,5	28146	197,5
2014	425607	992,0	256541	869,6	169066	1261,6	87890	204,9	61530	208,6	26360	196,7
2015	404551	1038,8	237849	921,7	166702	1268,8	79775	204,8	53839	208,6	25936	197,4
2016	392298	1010,7	230751	896,1	161547	1236,5	76733	197,7	51363	199,5	25370	194,2
2017	384810	995,8	226964	884,8	157846	1215,0	75733	196,0	50835	198,2	24898	191,6
2018	392060	1000,8	234397	882,6	157663	1225,0	76906	182,0	52117	181,2	24789	183,4
2019	389348	993,4	235466	882,2	153882	1205,6	76232	179,5	51774	178,3	24458	181,8
Тренд	-11,6	+2,3	-11,6	+3,1	-11,6	-1,3	-19,1	-13,6	-21,7	-16,1	-13,1	-7,9

Thus, conducting a study to determine national trends in morbidity and mortality from diseases of the circulatory system, cerebrovascular diseases and strokes in Ukraine is an actual task.

THE AIM

To determine national trends in morbidity and mortality from diseases of the circulatory system, cerebrovascular diseases and strokes.

MATERIALS AND METHODS

Data from official sources of statistical information of Ukraine (State Institution "Center for Medical Statistics of the Ministry of Health of Ukraine") were used to determine national trends in morbidity and mortality of diseases of the circulatory system, cerebrovascular diseases and strokes in Ukraine. A systematic analysis and generalization of the obtained data was performed and trends in morbidity and

mortality from diseases of the circulatory system, cerebrovascular diseases and strokes in Ukraine were calculated.

RESULTS

According to the official data of the Center for Medical Statistics of the Ministry of Health of Ukraine, significant levels of prevalence and primary incidence of circulatory diseases (DCS) with high levels of cerebrovascular disease (CVD) and stroke were found [16] – Table I.

During 2010–2017, there was a tendency to reduction of prevalence and primary incidence of DCS, CVD and stroke, but they are still quite significant and threatening. Thus, the prevalence of DCS had trends (-16.3 %) to reduce the overall incidence from 26523102 cases (2010) to 22199563 people (2017) and downward trends (-28.0 %) for the first time in the life of detected CVD diseases from 239705 to 1725137 patients (Table I).

There was also a decrease in CVD levels from 3268100 (2010) to 2521601 cases (2017) with a trend of -22.8 %

(prevalence of CVD) and a decrease in first-time CVD levels from 382916 (2010) to 290557 (2017) patients with a trend of -24.1 % (Table I).

There was also some (trend -12.2 %) decrease in the incidence of stroke from 110,421 (2010) to 96,978 (2017) patients with a significant increase in first-time stroke from 52,739 (2010) up to 96,978 (2017) persons with a trend of +83.9 % (Table I).

Significant national levels of prevalence and primary incidence of DCS, CVD and stroke in Ukraine according to official sources [17 20] provoke negative consequences as high mortality and disability rates due to DCS, CVD and stroke (Table II).

It is determined that the mortality from DCS according to the State Institution "Center for Medical Statistics of the Ministry of Health of Ukraine" [17 20] for 2013-2019 in Ukraine tends to decrease from 440369 (2013) to 389348 (2019).) cases with a trend of -11.6 %. It is established that mortality from CVD according to the State Institution "Medical Statistics Center of the Ministry of Health of Ukraine" [17 20] also tends to decrease in Ukraine from 94,267 cases (2013) to 76,232 people (2019) with a trend -19.1 %. It was stated that the levels of mortality reduction from DCS did not differ between urban and rural residents and had trends of -11.6 %. In terms of CVD mortality rates, urban residents had higher downward trends (-21.7 %) than rural residents (-13.1 %). Per 100,000 population, the death rate from DCS in 2013–2019 tended to increase with a trend of + 2.3 % due to urban residents with a trend of +3.1 % (Table II).

DISCUSSION

Our data are in complete agreement with other studies that indicate a reduction in morbidity and mortality from DCS and CVD in recent years. Thus, according to the results of the study Wu H. et al. [21] for 2007–2016, there was a decrease in mortality from stroke with age-adjusted rate by 21.6 %. Age-adjusted stroke mortality decreased by an average of 2.67 % annually. According to Soto Á. et al. [22] in the countries of the European Union there was a decrease in standardized age-related mortality rates from stroke per 100,000 population in 1996-2015 by an average of 4.2 %. All countries had declining trends (the largest in Estonia, Portugal and Austria). There was a statistically significant reduction in mortality among sick men and women by 4.2 % and 4.3 %. According to Baek J. et al. [23], it has been found that the overall mortality rate from DCS has increased in recent years due to global aging. It was determined that in 1983–2018 DCS tended to increase but CVD tended to decrease. From 1983 to 2018, there was a significant reduction in age-standardized mortality from all DCS, hypertension and CVD. Age-standardized mortality from coronary heart disease and myocardial infarction peaked in the 2000s, after which they tended to decline. Study of Cortesi P. A. [24] also confirmed significant reduction in the severity of DCS (especially age-standardized prevalence (-12.7 %), mortality (-53.8 %) and disability-adjusted life expectancy (-55.5 %) for 1990 2017 in most European countries.

CONCLUSIONS

1. The tendencies to decrease of the national levels of prevalence and primary incidence in Ukraine of DCS (-16.3% and -28.0%), CVD (-22.8% and 24.1%) and strokes (-12, 2%) with significant trends (+83.9%) of increase in primary incidence of stroke in 2010-2017 with fairly high and threatening levels for 2017 (respectively 22199563, 2521601 and 96978 – prevalence and 1725137, 290557 and 96978 – primary morbidity) were found.
2. National levels of reduction of mortality due to DCS in Ukraine from 440369 (2013) to 389348 (2019) with a trend of -11.6% and a decrease in mortality due to CVD from 94267 (2013) to 76232 (2019) with a trend of -19.1% were established.

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The work is a fragment of research work The Department of Public Health and Healthcare Management Kharkiv National Medical University: «Medical and social aspects of quality of life of the young age with excess weight and obesity» (2021-2023).

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Conflict of interest:

The Authors declare no conflict of interest.

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Received: 17.11.2021

Accepted: 06.04.2022

A – Work concept and design, B – Data collection and analysis, C – Responsibility for statistical analysis, D – Writing the article, E – Critical review, F – Final approval of the article