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DEVELOPMENT OF STROKE AMONG THE POPULATION >18-90 YEARS OF AGE AGAINST THE BACKGROUND OF AIR TEMPERATURE FLUCTUATIONS IN THE CLIMATIC CONDITIONS OF SOUTHERN KYRGYZSTAN

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ABSTRACT

Over the past decades, the unprecedented rate of global warming and climate change has been a source of concern. In recent years, climate change has been considered as one of the leading factors influencing public health and the formation of acute and chronic non-communicable diseases. The Fergana Valley of Kyrgyzstan belongs to a different climatic and geographical zone. Residents of the plains and low-mountain regions of southern Kyrgyzstan are more adapted to a hot climate, the effect of which on their health has not been studied using new WHO methodological approaches.

KEYWORDS

Stroke, Kyrgyzstan, air temperature, population

Introduction

Stroke and its growing “hard endpoint” (mortality, morbidity, emergency hospitalization) is not only a significant burden for the patient, but also a challenge to modern medical, especially preventive science, requiring the search for new effective preventive strategies . In developed countries, about 200,000 people die annually from cerebrovascular accidents and a large number of patients remain severely disabled. Among the 10 leading causes of death in the world, stroke ranks 3rd [5]. 75 out of 100 strokes are caused by modifiable factor hypertension and the majority (35 – 40%) of stroke “hard spots” can be prevented through early identification and intervention of this “silent killer” and global public health crisis, and through increased awareness population about methods of primary and secondary prevention [2,3]. Basically, the development of stroke is promoted not only by arterial hypertension (AH), but also by other modifiable risk factors (MRFs) - physical inactivity, stressful situations, smoking, obesity and dehydration, as well as weather and climate factors [4].

Meanwhile, these issues from the standpoint of stroke prevention remain insufficiently studied in regions with an unfavorable climate, in particular in the south of Kyrgyzstan. In recent years,

climatometeopathogenic mechanisms of the development and course of non-infectious diseases have been very actively studied by researchers from near and far abroad. The established connections of cardiovascular and cerebrovascular diseases with climatic and weather risk factors made it possible to rethink the known aspects of primary and secondary prevention of these pathologies, in particular in the example of stroke, through clinical and biorhythmological observations in individual populations and regions [1].

Purpose of the study: to analyze the development of stroke among the population >18-90 years old against the background of fluctuations in air temperature in the climatic conditions of southern Kyrgyzstan

Objectives of the study: study and assessment of the influence of meteorological factors on the development of strokes in the climatic conditions of Osh.

Material and research methods: We conducted a study using data from meteorological factors of the Kyrgyz Hydrometeorological Center in Osh, such as air temperature for a 4-year period from 2016-2019.

Results of the study: The results of our study show that at different levels of air temperature in the surveyed population of Osh, all forms of stroke are detected with significantly different frequencies. Thus, general stroke (cerebral stroke) with increasing air temperature increases from 8.0% at air temperature -5.2-1.9 0C to 17.0% at AT + 22-25.30C and 10.0% at + 25.4-28.70C, i.e. 1.2 times or 9.0%.

Table № 1 Development of stroke among the population >18-90 years of age against the background of air temperature fluctuations in the climatic conditions of southern Kyrgyzstan (1st line - in absolute numbers, 2nd - in%)

Колебание температуры воздуха (вС)	Распространенность различных форм																													
	Ишемический инсульт										Геморрагический инсульт										Общий инсульт									
	2016		2017		2018		2019		2016-2019		2016		2017		2018		2019		2016-2019		2016		2017		2018		2019		2016-2019	
	абс	%	абс	%	абс	%	абс	%	абс	%	абс	%	абс	%	абс	%	абс	%	абс	%	абс	%	абс	%	абс	%	абс	%	абс	%
-5,2-1,9	7	10	5	7	3	5	1	2	16	6	8	32	3	19	0	0	1	7	12	14	15	16	8	10	3	3	2	3	28	8
-1,8-1,5	2	3	1	1	5	8	1	2	9	3	7	28	2	13	0	0	1	7	10	11	9	9	3	4	5	5	2	3	19	5
1,6-4,9	3	4	4	6	8	13	9	15	24	9	8	32	0	0	7	23	0	0	15	17	11	11	4	5	15	16	9	12	39	11
5,0-8,3	7	10	4	6	19	30	5	8	35	13	2	8	0	0	8	26	0	0	10	11	9	9	4	5	27	28	5	7	45	13
8,4-11,7	5	7	3	4	6	9	4	7	18	7	0	0	0	0	2	6	0	0	2	2	5	5	3	4	8	8	4	5	20	6
11,8-15,1	18	25	6	9	2	3	9	15	35	13	0	0	1	6	0	0	4	27	5	6	18	19	7	8	2	2	13	17	40	11
15,2-18,5	7	10	9	13	6	9	9	15	31	12	0	0	3	19	3	10	4	27	10	11	7	7	12	14	9	9	13	17	41	12
18,6-21,9	1	1	6	9	6	9	7	11	20	8	0	0	1	6	3	10	1	7	5	6	1	1	7	8	9	9	8	11	25	7
22-25,3	11	15	22	33	8	13	9	15	50	19	0	0	4	25	2	6	3	20	9	10	11	11	26	31	10	11	12	16	59	17
25,4-28,7	10	14	7	10	1	2	7	11	25	10	0	0	2	13	6	19	1	7	9	10	10	10	9	11	7	7	8	11	34	10
Всего:	71	100	67	100	64	100	61	100	263	100	25	100	16	100	31	100	15	100	87	100	96	100	83	100	95	100	76	100	350	100
r(+/-)									0,561										0,391										0,380	
Mp(+/-)									35,2%										59,1%										31,5%	
t									1,916										1,200										1,160	
P									0,096963										0,268969										0,237553	

The same trend was noted for ischemic stroke. The frequency of detection of IS among the examined population, depending on the level and fluctuations of AT, increases by 1.6 times or 4.0% (r+=0.561; Mp=35.2%, t=1.916; p=0.096963). High levels of detection of IS are determined at AT+5.0-8.30C (13.0%), +11.8-15.10C (13.0%), +15.2-18.50C (12.0%) and +22-25.30C (19.0%). Low prevalence rates of IS were detected with AT fluctuations at the level of -1.8-1.50C (3.0%) and +8.4-11.70C (7.0%).

The detection rate of hemorrhagic stroke in the south of Kyrgyzstan also, according to our data, is directly dependent on the increase and fluctuations of AT. During 2016-2019, on average annually, depending on the fluctuations of this meteorological factor, cases of HI are observed with an increase of 3.0% (with minus AT) and by 9.0 and 8.0% (with positive AT). There is an increase in cases of HI with both decreased and increased AT. Thus, at different levels of AT, GI is detected with the following frequency: with AT < - 5.2-1.90C - 14.0%, <1.6-4.90C - 17.0%, <15.2-18 .50C-11.0% and with AT> 22-250C-10% (r+=0.391;Mr=59.1%, t=1.200; p=0.26899).

In general, there is a direct correlative relationship between AT and cerebral stroke among the surveyed population : with increases/decreases and intensification of its fluctuations, a significant increase in the detection of ischemic stroke, hemorrhagic stroke and cerebral stroke is noted. Such trends were noted during 2016-2019, i.e. the entire period of the 4-year clinical and meteorological study .

Conclusion

In general, there is a direct correlation between air temperature and cerebral stroke among the examined population: with increases/decreases and intensification of its fluctuations, there is a significant increase in the detection of ischemic stroke, hemorrhagic stroke and cerebral stroke. Such trends were noted during 2016-2019, i.e. the entire period of a 4-year clinical meteorological study.

References

1. Akshulakov S.K., Adilbekov E.B., Akhmetzhonova Z.B., Medukhanova S.G. Organization and state of the stroke service of the Republic of Kazakhstan based on the results of 2016 // Neurosurgery and neurology of Kazakhstan. – 2018. No. 1 (50). – P. 31 – 35.
2. Akhmetzhanova Z.B., Medukhanova S.G., Zhumabaev G.Kh., Adilbekov E.B. Stroke in Kazakhstan // Neurosurgery and neurology of Kazakhstan. – 2019. - No. 2 (with special issue). – P. 8 – 35.
3. Sadykova D.Z., Adilbekova B.B., Medramova A.M., Rib E.A. and others. The influence of blood lipids and lipid-lowering therapy on the secondary prevention of strokes // Journal of Neurosurgery and Neurology of Kazakhstan. - 2020. - No. 2 (59). – P. 65 – 69.
4. Skvortsova I., Koltsova E.A., Kamelfeld E.I. Comparative analysis of risk factors and pathogenetic variants of ischemic stroke in young and old people // Kursk scientific and practical journal “Man and his health”. – 2012; 3: 82 – 85.
5. Korob I.Yu. Arterial hypertension and strokes: possibilities of prevention using antihypertensive therapy // Medical news. – 2012. - No. 10. – P. 26 – 27.
6. Rasulova H.A. Meta-analysis of risk factors for cerebrovascular diseases // Neurology. - Tashkent. – 2010. - No. 1. – P. 49 – 51.
7. Tibekina L.M., Dorofeeva M.S., Shcherbuk Yu.A. Cardioembolic stroke: etiology, pathogenesis, risk factors for hemorrhagic transformation / review /. // Bulletin of St. Petersburg University. – 2014. – Issue. 1. – P. 1 04 – 115.

8. Khadzhibaev A.M., Makhkamov K.E., Makhkamov M.K., Salaev A.B. Surgery of cerebral aneurysms: twenty years of experience of the Republican Scientific Center for Emergency Medical Care // Bulletin of Emergency Medicine. – 2022. – 15 (6). pp. 5 – 9.
9. Chekueva N.T., Shleife S.G., Bembinov E.M. Indicators of heart rate variability in patients with cerebrovascular pathology in low-altitude conditions // Journal of Neurosurgery and Neurology of Kazakhstan. – 2018. - No. 2 (51). – P. 1 – 7.Arumugan I.V., Manzanero S., Furtado M. et al. An atypical role for the myeloid receptor mincle in central nervous system injury // J Cereb Blood flow metab. - 2016; 27. doi: 101177/0271678X16661201.
10. Bogiatzi C. Hackam D.G., McLeod A.I., Spence I.D. Secular trends in ischemic stroke subtypes and stroke risk factors. Stroke. 2014; 45 (11): 3208 – 13.
11. Brinjikji W., Rabinstein A., Lanzino G. et al. Ultrasound Characteristics of Symptomatic Carotic Peagues: A systematic Review and Meta – Analysis // Cerebrovascular Diseases. - 2015; 40 (3 - 4): 165 – 175. https: // doi.org/10.1159/000437339.
12. Brott TG, Halperin J.L. Abara S., Bacharach S.M. et al. 2011 ASA/ACCF/AHA/AANN/AANS/ACR/ASNR/CNS/SAIP/ACAI/SIR/SNIS/SYM/SVS Guideline on the Management of patients with Extracranial Carotid and Vertebral Artery Disease: Executive Summary // J Am Coll Cardiol. - 2011; 57 (8): 1002 – 1042. https: // doi.org/10.1016/j.jacc.2010.11.005.
13. Bum J.K., Jong S.K., Ische stroke subtype classi fication: An Asion Viewpoint. J. Stroke. 2014; 16 (1): 8 – 17.
14. Catapano A., Reiner Z., De Backer G. et al. ESC/EAS Guidelines for the management of dyslipidemias. The Task Force for the management of dyslipideamias of the European Society of Cardiology (ESC) and the European Atherosclerosis Society (EAS) // Atherosclerosis – 2011. – 2175 – P. s 1 – s. 41.