



THE STRUCTURE OF THE BLOOD CIRCULATION SYSTEM DISEASES AND CHARACTERISTICS OF INCIDENCE ISCHEMIC STROKE IN GEORGIA

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KEYWORDS :

INTRODUCTION

According to World Health Organization data, from the blood circulation system diseases, exactly cerebrovascular diseases represent the second main causing factor of mortality and third main – of disablement. The disability caused by this disease is strong, which represents not only medical problem, but social and economic ones as well.

In Georgia at non-transferable diseases, the biggest part of the “burden” of diseases comes for and has big impact on the most productive years of life. Non-transferable diseases have impact not only on health, but on sustainable development as well. The part of the blood circulatory system diseases equals to 15.3% of all diseases registered in Georgia, and for new cases it equals to 7.4%. In this group of diseases, hypertension, ischemia and cerebrovascular diseases are characterized with high morbidity and mortality (Database of Ministry of Labor, Health and Social Affairs of Georgia and of Disease control and medical statistics, 2018)

From the cerebrovascular diseases group, cases of morbidity with ischemic stroke are the most important, as important and increasing problem for the health of society. Timely and effective management of the stroke is one of the challenges for the modern medicine, as the value of morbidity and disablement caused by the noted disease is high. It shall also be considered that the patient who have taken over the stroke, require permanent supervision, care, and medicinal treatment, which is related to high financial and other type expenses. The cost for each such patient for the entire life, in USA ranges between 55 000 and 73 000 US Dollars, National Stroke Foundation, 2007.

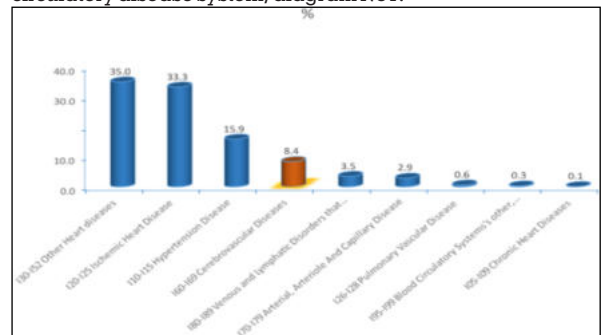
MATERIAL AND METHODS:

According to the importance and urgency of the above discussed topic, it was additionally examined and was confirmed, in Georgia the structure of the blood circulatory system, the part of ischemic stroke in the structure of blood circulatory diseases and incidence of ischemic stroke in Georgia in 2016-2021 years according to the regions.

Based on the written request from the National Health Agency of Georgia, the electronic base was supplied, which represented the information regarding the executed/financed medical service for citizens of Georgia in 2016-2021 years, where the basis for addressing to the hospital for the patient was diseases of the blood circulatory systems. The base included 851 543 cases. The registration, processing, statistics interpretation and analysis was performed by the statistical program SPSS's statistical package, with the version of IBM SPSS Statistics for Windows 23.0 Obtained statistical data was represented by the tables and diagrams. Considering the recommendations of the international organizations descriptive and analytical research was carried out. The data was processed with several directions, particularly, according to age, gender, date of the case, medical institution, time spent at hospital, the content of performed service (conservative treatment/management with modern methods: thrombolysis, thrombectomy) and accordingly to the geographic location of the location of the medical institution throughout Georgia.

RESULTS AND THEIR DISCUSSION:

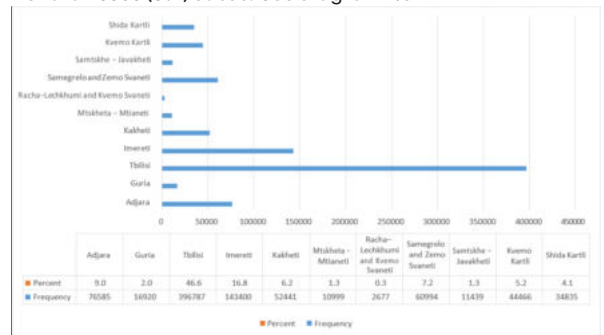
Within the scopes of research, structuring of blood circulatory system diseases was performed according to ICD 10's main classes: particularly, from 851 586 cases, the biggest part 298 471 (35%) comes for other heart diseases (I30-I52), heart's ischemic diseases (I20-I25) are at second place 283485 (33.3%), hypertension diseases take the third place 135655 (19.5%), and the part of cerebrovascular diseases equal to 71481 (8.4%), which take the 4th place in the structure of blood circulatory disease system, diagram No1.



Source (research materials)

Diagram No1. The structure and frequency of diseases of blood circulation in Georgian in 2016-2021 years

In terms of regional distribution, the frequency of the cases of diseases of blood circulation is distributed across the whole territory of the country, in terms of the significant number of cases, it is important to highlight following 3 main categorical unit: Tbilisi – 396787 (46.6%) cases, Imereti 143400 (16.8%), Achara 76585 (9%) cases. See diagram No 2



Source (research materials)

Diagram No2 Frequency of the blood circulation diseases in Georgia according to the territorial units in 2016-2021 years.

In the structure of the blood circulation diseases, the direct part of ischemic stroke (I63.0 – I63.9) equals to 5.9% and is at the 5th place among the most frequent diagnosis of the blood circulatory system's diseases, diagram No 3

2016-2021 years – distribution of hospitalized patients into the age-related groups with the diagnosis of ischemic stroke -I63. At the represented diagram, the number of cases is minimum

in the category till the age of 35, after 35 years is characterized with small increasing tendency, however, the number of cases is at minimum level, after 65 years start to increase rapidly, reaches the peak at 80-84 age- related section, and starts decreasing above 85 years. Al these can be explained by etiological and pathophysiological processes going on the human body diagram No 4.

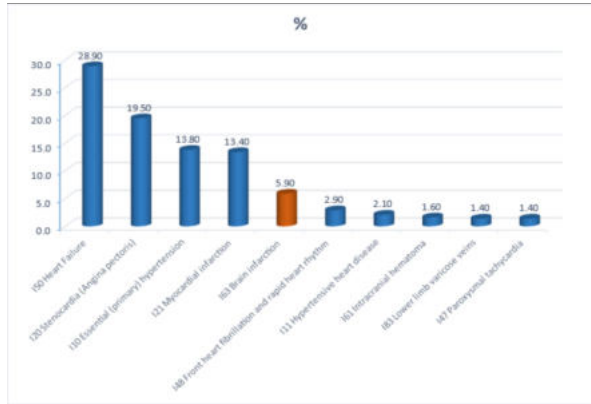


Diagram No 3 The part of the ischemic stroke in the structure of diseases of blood circulation (according to ICD10)

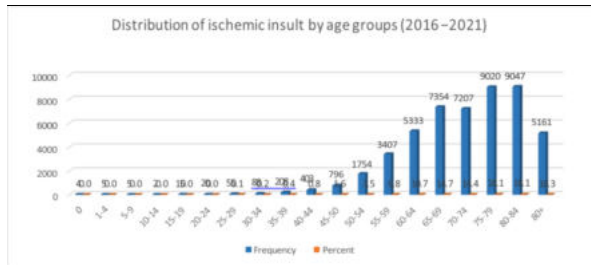


Diagram No 4 Distribution of the hospitalized patients diagnosed with ischemic stroke into the age- related groups 2016-2021 years.

The value of morbidity of ischemic stroke in Georgia on every 100 000 citizens in 2016 year was 146 unit, in 2021 237 unit. For 6 years, the noted value has increased by 60%, which is quite significant, however, this value according to age is quite different and reveals correlative dependence towards the age. If it can encounter in single cases till 35 years, above 45 years, it increases significantly and reaches critical point above 75 years, when this value on each 100 000 people exceeds above 1000 people. The increasing value within 6-year interval may vary from 40% till 80%.

Crude Rate – C And Age Specific Rate

Age	Years					
	2016	2017	2018	2019	2020	2021
0-4	0.0	1.5	0.0	0.4	0.4	1.2
5-9	0.0	0.0	0.0	0.4	0.4	1.1
10-14	0.0	0.0	0.0	0.0	0.0	0.8
15-19	0.0	1.9	1.0	1.9	1.0	1.5
20-24	2.0	0.9	3.6	0.9	0.9	0.5
25-29	1.4	3.6	5.9	4.6	1.6	3.8
30-34	3.0	9.2	3.7	4.0	8.5	4.0
35-39	10.4	11.6	15.5	15.9	18.0	10.6
40-44	26.4	23.5	24.8	28.6	35.0	28.4
45-49	35.5	56.7	62.8	58.0	68.3	57.0
50-54	86.2	102.3	120.9	137.1	147.8	134.8
55-59	146.0	206.1	237.8	251.9	234.6	244.5
60-64	259.8	368.1	409.9	427.5	425.8	443.9
65-69	451.5	649.3	680.7	739.0	698.1	671.9
70-74	609.2	929.7	1023.4	1169.6	1059.8	1047.0
75-79	930.2	1336.6	1393.0	1477.1	1513.7	1347.6
80-84	1139.1	1852.9	2029.4	2142.1	1965.9	1755.7

85 +	1203.0	1846.5	2181.1	2244.7	2152.8	2109.0
Sum	146.0	215.3	237.1	255.5	248.3	236.9

The standardized value of ischemic stroke by age from 2016 till 2021 increased from 72 units till 115 units. In this case, the critically high was 60-75 years, the maximum value was revealed on 2019 for 70-74 year age-related group – 2399 and for 65-69 year age-related group 2217 unit. Based on this value, the critical age was defined as the range between 60-75 years.

Age Standardized Rate -ASR

Age	Years					
	2016	2017	2018	2019	2020	2021
0-4	0.0	17.5	0.0	4.3	4.5	14.2
5-9	0.0	0.0	0.0	3.9	3.8	11.2
10-14	0.0	0.0	0.0	0.0	0.0	7.4
15-19	0.0	16.7	8.6	17.5	8.8	13.2
20-24	16.2	6.9	28.5	7.3	7.3	3.7
25-29	11.5	28.9	46.8	36.6	12.8	30.3
30-34	17.9	55.3	22.0	24.3	51.1	24.2
35-39	62.6	69.8	93.0	95.1	107.9	63.8
40-44	158.4	141.3	148.7	171.6	210.1	170.6
45-49	212.7	340.1	377.1	348.2	410.1	342.2
50-54	431.2	511.7	604.6	685.7	739.0	673.8
55-59	584.0	824.4	951.1	1007.6	938.2	977.9
60-64	1039.0	1472.5	1639.5	1710.0	1703.1	1775.8
65-69	1354.6	1947.9	2042.0	2217.1	2094.4	2015.6
70-74	1218.4	1859.4	2046.8	2339.2	2119.7	2093.9
75-79	930.2	1336.6	1393.0	1477.1	1513.7	1347.6
80-84	569.6	926.4	1014.7	1071.0	982.9	877.8
85 +	601.5	923.3	1090.6	1122.3	1076.4	1054.5
	72.1	104.8	115.1	123.4	119.8	115.0

As it was mentioned, morbidity of ischemic stroke with age standardized value was changed within the range of 72-115 unit in 2016-2021 years, however, the highest value was recorded on 2019, 123.4 unit, With 95.5% of confidence interval, deviations are quite low and it changes from 0.9 till 2.0 accordingly to the years, which is quite low value.

Standardized Value Of Ischemic Stroke With I63 Age CI95.5%

Age	Standardized value By age	95% Confidence Interval		Deviation
		Lower	Upper	
2016	72.1	72.1	72.1	0.9
2017	104.8	104.8	104.8	1.6
2018	115.1	115.1	115.1	1.8
2019	123.4	123.4	123.4	2.0
2020	119.8	119.8	119.8	1.9
2021	115.0	115.0	115.0	1.8

In case the obtained results are grouped within two-three-year period (2016-2018 and 2019-2021) and are compared to each other, the following image will be obtained. The morbidity of the ischemic stroke cases according to the age specific frequency, can be encountered at any age-related group, however, the beginning of increasing tendency is depicted in the groups above 50-54 years, when the value exceeds 100. The peak comes with people above 85 years and the noted value exceeds 1700 people. In 2019-2021 years, compared to 2016-2018 years, the increase in morbidity value can be seen in almost all age-related subgroups. The most important peak comes at 85+ years, when disease frequency increases from 1739.4 personnel to 2168.9 one, according to all age-related groups, in 2016-2018 years, on every 100 000 people 199.5 cases were depicted, in 2019-2021 – 246.9 cases.

According to age standardized value, similarly to age specific value, in 2019-2021 years, compared to 2016-2018 ones, the increase in the morbidity value of ischemic stroke disease in all age-related groups is present, (except 20-24 and 25-29 age

related groups), the highest value of ischemic stroke morbidity as in 2016-2018 years as well as in 2019-2021 years was recorded in 70-74 age related groups and in 2016-2018 years 1710.5 cases were recorded and in 2019-2021 years – 2175.7 cases.

According to all age-related groups, in 2016-2018 years, on every 100 000 people 97.4 cases were revealed, in 2019-2021 years – 119.3 cases.

Calculation of truncated age-standardized rate (TASR) in case of patients hospitalized with ischemic stroke was carried out above 65 years, as the number of the cases exceeded 170 units exactly in this age-related category. The mentioned value in 2016-2018 years was 6427.6 units, in 2019-2021 years 7794.4 units. Table 1

Age	Crude rate- C and Age- specific rate - ai		Age- Standardized Rate - ASR		Truncated Age- Standardized Rate - ASR	
	2016-2018	2019-2021	2016-2018	2019-2021	2016-2018	2019-2021
0-4	0.5	0.6	5.8	7.5		
5-9	0	0.6	0	6.4		
10-14	0	0.3	0	2.6		
15-19	0.9	1.5	8.4	13.1		
20-24	2.1	0.8	17.1	6.1		
25-29	3.6	3.3	29	26.7		
30-34	5.3	5.5	31.7	33.1		
35-39	12.5	14.8	75.2	88.7		
40-44	24.9	30.7	149.5	184		
45-49	51.6	61.1	309.8	366.8		
50-54	102.8	139.9	513.9	699.4		
55-59	197.1	243.7	788.4	974.7		
60-64	346.9	432.5	1387.5	1730.2	1790.8	2107.9
65-69	596.9	702.6	1790.8	2107.9	1710.5	2175.7
70-74	855.2	1087.9	1710.5	2175.7	1212.6	1451.7
75-79	1212.6	1451.7	1212.6	1451.7	844.1	974.7
80-84	1688.1	1949.4	844.1	974.7	869.7	1084.5
85 +	1739.4	2168.9	869.7	1084.5	6427.6	7794.4
Sum	199.5	246.9	97.4	119.3	918.2	1113.5

CONCLUSION:

The results of the research gives the opportunity to create the map illustrating the incidence of ischemic stroke, which was used to determine number and location of the necessary centers of the stroke considering geographic accessibility of the country, to improve ischemic stroke management strategy and patients to receive the service foreseen by the international guidelines.

“Impact of the asbestos exposure on population health”

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1. Database of Ministry of Labor, Health and Social Affairs of Georgia and of Disease control and medical statistics, 2018
2. National Stroke Foundation, 2007