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ANALYSIS OF POPULATION MORTALITY FROM ENDOCRINE DISEASES AND DIABETES MELLITUS IN THE REPUBLIC OF SAKHA (YAKUTIA) SINCE 2018 TO 2022

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АНАЛИЗ СМЕРТНОСТИ НАСЕЛЕНИЯ ОТ ЭНДОКРИННЫХ ЗАБОЛЕВАНИЙ И САХАРНОГО ДИАБЕТА В РЕСПУБЛИКЕ САХА (ЯКУТИЯ) ЗА 2018–2022 ГГ.

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Objective. To analyze the mortality from endocrine pathology of the population in the Republic of Sakha (Yakutia).

Materials and methods. A retrospective analysis of the mortality rates from endocrine diseases and diabetes mellitus of the population of the Republic of Sakha (Yakutia) from 2018–2022 was carried out. The analysis was based on the data of YARMIAC and the republican register of diabetes mellitus.

Results. An increase in the death rate from endocrine pathology, from diabetes mellitus was noted during the analyzed period. In the structure of mortality from endocrine pathology, deaths from diabetes mellitus were 96 %. The structure of causes of death in patients with diabetes mellitus includes renal failure, CHF, acute myocardial infarction, PE and pneumonia.

Conclusions. The results obtained during the study will allow us to justify the need for improving the endocrinological service in the Republic of Sakha (Yakutia) scientifically and will form the basis for the regional program “Combating diabetes mellitus”.

Keywords. Morbidity, mortality, endocrine pathology, diabetes mellitus, Yakutia.

Цель. Анализ смертности населения от эндокринной патологии в Республике Саха (Якутия).

Материалы и методы. Проведен ретроспективный анализ показателей смертности населения от эндокринных заболеваний и от сахарного диабета в Республике Саха (Якутия) за 2018–2022 гг. по данным ЯРМИАЦ и Республиканского регистра сахарного диабета.

Результаты. За анализируемый период отмечается повышение показателя смертности населения от эндокринной патологии. В структуре смертности от эндокринной патологии – смертность от сахарного диабета составляет 96 %. В структуре причин смерти пациентов с сахарным диабетом – почечная недостаточность, ХСН, острый инфаркт миокарда, ТЭЛА и пневмония.

Выводы. Полученные результаты позволят научно обосновать необходимость совершенствования эндокринологической службы в Республике Саха (Якутия) и лягут в основу региональной программы «Борьба с сахарным диабетом».

Ключевые слова. Заболеваемость, смертность, эндокринная патология, сахарный диабет, Якутия.

INTRODUCTION

The spread of diabetes mellitus is becoming more important from year to year in the world in general and particularly in the Russian Federation. This disease is a global medicosocial threat to the person and society as a whole [1; 2]. The Russian Federation has accepted the series of strategic documents for improvement of endocrinological service and medical care organization for this group of patients. It is necessary to point out that there are not many works devoted to the analysis of mortality of patients suffering from diabetes mellitus, especially in the regions of the Russian Federation. The study of epidemiol-

ogical characteristics of diabetes mellitus will allow to develop effective organizational mechanisms for reducing morbidity, disability, and mortality [3–5].

According to the data of federal and regional registers of diabetes mellitus morbidity in recent years and in the postpandemic period, there is a clear increase of 1 and 2 diabetes mellitus type among the population [1; 5]. Therefore, it is particularly important to study the mortality rates of the population from diabetes mellitus.

The Republic of Sakha (Yakutia) is one of the regions of the Far Eastern Federal District with a well-organized endocrinology department. All specialized medical care in the field of endocrinology is located in

Yakutsk. There is a unified register of patients. The population of the republic is quite heterogeneous in terms of ethnicity. In connection with the above, the republic has the potential to become a pilot northern region for monitoring the epidemiological characteristics of diabetes mellitus and for improving the endocrinological department in the Arctic zone of the Russian Federation.

MATERIALS AND METHODS

The retrospective analysis of population mortality rates from endocrine diseases and diabetes mellitus in the Republic of Sakha (Yakutia) for the period 2018–2022 was conducted. The official statistics data are taken from the Yakutsk Republican Medical Information and Analytical Center (YRMIAAC), which is the republican register of diabetes mellitus of the Republic of Sakha (Yakutia).

RESULTS AND DISCUSSION

Since 2018–2022, the main classes of mortality causes of the population demonstrate a steady growth of the number of deaths, including diseases of the endocrine system and diabetes mellitus. The highest mortality rates from all causes are identified in 2021 (1,067.8 per 100,000 of population). The highest mortality rates from endocrine diseases, eating disorders and metabolic disorders are registered in 2020 (27.6 per 100,000 of population) and mainly because of mortality from diabetes mellitus (26.0 per 100,000 of population). The total mortality

rate from all causes increased by 5.7 % in the changes for the analyzed period – from 784.1 in 2018 to 828.5 in 2022, including diseases of the endocrine system – by 26.4 %, from 17.8 to 22.5, including diabetes mellitus – by 31.7 %, from 16.4 to 21.6 per 100 thousand of the population, respectively (Table 1).

The largest share in the mortality structure from endocrine diseases is mortality from diabetes mellitus (average from 92.8 % to 96.0 %). At the same time, the number of deaths from insulin-independent diabetes mellitus is significantly higher than from non-insulin-dependent diabetes mellitus. The dynamics over the five-year period shows an increase in the share of deaths caused by diabetes mellitus from 92.8 % in 2018 to 96.0 % in 2022, mainly because of the non-insulin-dependent form of diabetes. Thus, the specific volume of the number of deaths from non-insulin-dependent diabetes mellitus in 2018 was 69.0 %, in 2022 – 86.5 %. The specific volume of the number of deaths from insulin-dependent form of diabetes in changes, on the contrary, is decreasing: if in 2018 the specific volume of deaths from insulin-dependent form of diabetes amounted to 25.3 %, then in 2022 – 12.1 % (Table 2).

From 13.7 % to 17.8 % of endocrine diseases deaths from 2018 to 2022 are registered in the working age group (2018 – 14 %; from 2022 – 17.8 %), the majority of which are men (more than 53.1–75 %). Women share is from 25 % to 46.9 % in this age category. The overwhelming majority of deaths from endocrine diseases are registered annually at the

Table 1

Changes of mortality rate of the population of the Republic of Sakha (Yakutia) according to classes and individual causes of death, 2018–2022 (per 100 thousand of the population)

Rate	2018	2019	2020	2021	2022	Increase/ decrease, in % 2022 to 2018
Deaths from all causes, including:	784.1	784.0	929.5	1 067.8	828.5	5.7
diseases of the endocrine system, eating disorders, metabolic disorders	17.8	18.1	27.6	21.6	22.5	26.4
of them from diabetes mellitus	16.4	16.7	26.0	20.6	21.6	31.7

Table 2

Changes of the population mortality structure from endocrine diseases in the Republic of Sakha (Yakutia), 2018–2022

The cause of death	2018		2019		2020		2021		2022	
	abs.n.	%	abs.n.	%	abs.n.	%	abs.n.	%	abs.n.	%
Endocrine diseases	172	100	175	100	270	100	213	100	224	100
Diabetes mellitus, including:	158	92.8	162	92.6	254	94.1	203	95.3	215	96.0
insulin-dependent diabetes mellitus	40	25.3	36	22.2	29	11.4	19	9.4	26	12.1
non-insulin-dependent diabetes mellitus	109	69.0	120	74.1	218	85.8	182	89.7	186	86.5
other forms of diabetes	9	5.7	6	3.7	7	2.8	2	0.9	3	1.4
Malnutrition	0	0	1	0.6	4	1.5	0	0	3	1.3
Other endocrine diseases, eating disorders and metabolic disorders	14	8.1	12	6.9	12	4.4	10	4.7	6	2.7

age above working age – from 77.2 % to 84.9 %, of which women prevail – more than 60 %. The share of men was from 20.5 % to 33.5 % during the analyzed period.

The number of deaths from endocrine diseases increased in both age categories in the changes for 2018–2022: of working age – to 66.7 % and above working age – to 18.5 %.

The number of deaths from diabetes mellitus in 2022 increased, in comparison with 2018. It increased to 36.1 % (57 people). The women's share of population prevails in the structure of mortality of the republic from diabetes mellitus (2018 – 70.9 %; 2022 – 69.3 %), the men's share of population is less than 40 % (2018 – 29.1 %; 2022 – 30.6 %).

The majority deaths from diabetes mellitus are registered above working age (2018 – 86.7 %; 2022 – 77.7 %), in 2018 – 78.8 % of women and 21.2 % of men; in 2022, 66.4 % of women and 33.5 % of men. 17.2 % of deaths from diabetes mellitus were registered among the able-bodied population for 2022 (2018 – 13.3 %), among men prevail – 67.5 %, women's share is for about 32.4 % (in 2018, the share of men – 81 %, the share of women – 19 %).

The number of deaths from diabetes mellitus in both age categories increased in the changes for 2018–2022: at working age by 76.2 % and above working age by 21.9 %.

The urban population prevails in the structure of population mortality from diabetes mellitus (2018 – 71.2 %; 2022 – 69.6 %), there were 69.4 % of women in 2018 and 30.6 % of men; in 2022 – 60.6 % of women and 39.4 % of men.

The rural population is about 30 % (2018 – 28.8 %; 2022 – 30.4 %), in 2018 – 69.4 % of women and 30.6 % of men; in 2022, 59.7 % of women and 40.3 % of men.

The changes for 2018–2022 shows an increase in the number of deaths from diabetes mellitus in both population categories: rural population to 26.5 % and urban population to 17.4 %.

The largest share in the structure of immediate causes of mortality of patients with diabetes mellitus in 2022 were: renal failure (20.0 %), chronic heart failure (18.6 %), acute cerebral circulatory failure

(7.9 %), acute myocardial infarction (5.1 %), PATE and pneumonia (4.2 % each).

The following changes occurred over the five-year period: the share of deaths from renal failure increased (from 15.8 % in 2018 to 20.0 % in 2022), pneumonia (from 1.3 % to 4.2 %), PATE (from 3.2 % to 4.3 %); the share of deaths from a sepsis decreased (from 1.9 % in 2018 to 0.9 % in 2022), acute myocardial infarction (from 7.0 % to 5.1 %), acute cerebral circulatory failure (from 10.8 % to 7.9 %), chronic heart failure (from 31.0 % to 18.6 %) (Table 3).

Comparing the immediate causes of death among patients with diabetes mellitus in 2022 and in 2018, there is a 33.3 % decrease from sepsis deaths, decrease from chronic heart failure deaths to 18.4 %, and to 100.0 % decrease from gastrointestinal diseases deaths. However, there was an increase of deaths from pneumonia to 350.0 % (from 2 cases in 2018 to 9 cases in 2022), PATE to 80.0 % (from 5 to 9 cases respectively), and renal failure to 72.0 % (from 25 to 43 cases). The highest number of deaths among patients with diabetes mellitus occurred from sepsis, acute myocardial infarction, and acute cerebral circulatory failure in 2020 (it is the beginning of the occurrence and spread of the incidence of a new coronavirus infection). The highest number of deaths among patients with diabetes mellitus occurred from renal failure and chronic heart failure in 2021. The mortality rate among diabetic patients increased to 15.9 % (Table 4) in changes over the five-year period.

Table 3

Changes of the structure of immediate causes of death among patients with diabetes mellitus, 2018–2022

Rate	2018		2019		2020		2021		2022	
	abs.n.	%	abs.n.	%	abs.n.	%	abs. n.	%	abs.n.	%
Deaths from diabetes mellitus, the number of people	158	100	162	100	254	100	203	100	215	100
Sepsis	3	1.9	4	2.5	7	2.8	5	2.5	2	0.9
AMI	11	7.0	11	6.8	18	7.1	6	3.0	11	5.1
PATE	5	3.2	3	1.9	8	3.1	7	3.4	9	4.2
AFCC	17	10.8	15	9.3	24	9.4	8	3.9	17	7.9
Pneumonia	2	1.3	1	0.6	7	2.8	7	3.4	9	4.2
Renal failure	25	15.8	19	11.7	43	16.9	45	22.2	43	20.0
Gangrene		0.0	1	0.6	1	0.4	2	1.0		0.0
CHF	49	31.0	49	30.2	42	16.5	47	23.2	40	18.6
GI	1	0.6	2	1.2	3	1.2		0.0		0.0

Table 4

Changes of immediate causes of death among patients with diabetes mellitus, 2018–2022

Rate	2018	2019	2020	2021	2022	Increase/decrease 2022 to 2018, in %
The immediate cause of death of patients with diabetes mellitus in total of which:	113	105	153	127	131	15.9
sepsis	3	4	7	5	2	–33.3
acute myocardial infarction	11	11	18	6	11	–
PATE	5	3	8	7	9	80.0
acute cerebral circulatory failure	17	15	24	8	17	–
pneumonia	2	1	7	7	9	350.0
renal failure	25	19	43	45	43	72.0
gangrene	0	1	1	2	0	0
chronic heart failure	49	49	42	47	40	–18.4
gastrointestinal diseases	1	2	3	0	0	–100

CONCLUSIONS

There is an increase in the mortality rate of the population from endocrine pathology to 26.4 %, from diabetes mellitus to 31.7 % in the changes for the analyzed pe-

riod of 2018–2022. Mortality from diabetes mellitus is 96 % in the structure of mortality from endocrine pathology, of which 86.5 % is mortality from non-insulin-dependent diabetes mellitus; 77 % are disabled people, 66 % are women. In the structure of causes

of death of patients with diabetes mellitus – 20 % renal failure, 18.6 % – CHF, 5 % – acute myocardial infarction, 4.2 % – PATE and pneumonia. During the coronavirus pandemic, the pattern of causes of death among patients differed significantly from the pre-pandemic period. The obtained results will allow to substantiate scientifically the necessity of improvement of the endocrinological department in the Republic of Sakha (Yakutia) and will form the basis of the regional program “Fighting Against Diabetes Mellitus”.

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