КЛИНИЧЕСКИЕ И ГЕНДЕРНЫЕ РАЗЛИЧИЯ ЗАБОЛЕВАЕМОСТИ ИНСУЛЬТОМ В РЕСПУБЛИКЕ КАРАКАЛПАКСТАН

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Аннотация: В данном исследовании проанализирована динамика показателей заболеваемости инсультом в экологически кризисной зоне Республики Узбекистан - Приаральском регионе, по четырём районам (Нукус, Кегейли, Амударья и Муйнак). Всего в исследование было включено 2658 пациентов, из которых 54,6% составляли мужчины и 44,5% - женщины. Ишемический инсульт был зарегистрирован в 44,8% случаев, геморрагический - в 38,6%, а инсульт неуточнённого типа - в 16,6%. Наибольшая заболеваемость наблюдалась в возрастной группе 50-79 лет, особенно в диапазоне 60-69 лет (у мужчин - 35,9%, у женщин - 29,7%). Анализ по районам показал, что в Амударьинском и Муйнакском районах частота инсульта среди женщин выше, особенно в возрастной группе 60-69 лет (соответственно 35,3% и 32,0%). По результатам статистического анализа установлено, что среди мужчин преобладает ишемический инсульт, тогда как у женщин старше 70 лет показатели инсульта значительно выше. Результаты исследования свидетельствуют о том, что недостаточный контроль артериальной гипертензии и сосудистых факторов риска в регионе способствует высокой доле геморрагического инсульта.

Ключевые слова: ишемический инсульт, геморрагический инсульт, регистр инсультов, эпидемиология, возрастные особенности, гендерные различия, региональные факторы.

CLINICAL AND GENDER DIFFERENCES IN STROKE MORBIDITY IN THE REPUBLIC OF KARAKALPAKSTAN

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Abstract: This study analyzes the dynamics of stroke incidence in the ecologically crisis-affected Aral Sea (Priaralye) region of Uzbekistan, focusing on four districts - Nukus, Kegeyli, Amudarya, and Muynoq. A total of 2,658 patients were registered, of whom 54.6% were men and 44.5% were women. Ischemic stroke accounted for 44.8% of cases, hemorrhagic stroke for 38.6%, and undifferentiated stroke for 16.6%. The most affected age groups were between 50 and 79 years, with the highest incidence observed among those aged 60-69 years (35.9% in men and 29.7% in women). The analysis revealed regional differences in disease dynamics: in the Amudarya and Muynoq districts, stroke was more prevalent among women, particularly in the 60-69 age group (35.3% and 32.0%, respectively). Statistical analysis showed that ischemic stroke predominated among men, while women over 70 years of age exhibited a higher incidence of stroke overall. The results of this study confirm that the high proportion of hemorrhagic strokes in the region is associated with insufficient control of hypertension and other vascular risk factors.

Keywords: ischemic stroke, hemorrhagic stroke, stroke registry, epidemiology, age characteristics, sex differences, regional features.

1. Introduction

Stroke is one of the leading causes of death and disability worldwide and holds a significant place among global public health challenges. According to the

World Health Organization (WHO), stroke ranks second after cardiovascular diseases, with nearly 13 million new cases recorded annually, of which about 6.2 million result in death. This disease is critical not only because of its high mortality rate but also due to its long-term disabling consequences. Each year, more than 80 million people around the world are forced to live with varying degrees of disability caused by stroke [1].

In the United States alone, approximately 795,000 people suffer a stroke annually, and more than 140,000 of them die as a result. Statistical data indicate that up to 80% of stroke cases are preventable, yet the prevalence remains high due to unhealthy lifestyles, arterial hypertension, and other risk factors [2].

Global data confirm that stroke poses a major threat not only in developed countries but also in low- and middle-income nations. In developing regions, the high incidence of stroke combined with limited treatment opportunities leads to significantly higher mortality rates. For instance, African and Asian countries show considerably higher stroke-related mortality compared to Europe and North America. Moreover, in recent years, the incidence of stroke has been increasing among younger populations and women, making prevention, early diagnosis, and improvement of medical care quality urgent priorities on a global scale [3, 4].

In Uzbekistan, particularly in the Aral Sea (Priaralye) region, the study of stroke epidemiology deserves special attention due to the influence of socioeconomic and ecological factors. The region's ecological crisis and social-economic difficulties have a direct impact on public health, making the analysis of stroke distribution and risk factors especially relevant [5, 6].

2. Study Area and Methods

The object of this study consists of patients diagnosed with stroke in the Republic of Karakalpakstan, specifically in the districts of Nukus, Kegeyli, Amudarya, and Muynoq, during the period from 2019 to 2024.

The subject of the research is the epidemiological characteristics of stroke, including the distribution of morbidity by age, sex, and district, the ratio of stroke types (ischemic and hemorrhagic), and their relationship with regional factors.
The aim of the study is to determine the prevalence and structural features of stroke in the Karakalpakstan region based on registry data, to identify risk groups, and to develop scientifically grounded preventive and organizational recommendations for the regional healthcare system.

In the study, epidemiological analysis, descriptive-statistical methods, spatial comparison, and percentage analysis techniques were applied. The data were obtained from the stroke registry database and categorized according to age, sex, district, and stroke type. Using statistical analysis, the main patterns of morbidity, risk groups, and predominant demographic factors in the region were identified.

3. Results and Discussion

The results show clear gender and type-based differences in stroke incidence. These findings highlight the importance of regional health monitoring and preventive strategies. (Fig. 1 and 2). Based on registry data, a total of 2,658 stroke patients were recorded in the Priaralye (Republic of Karakalpakstan) region during the period 2019-2024. Among them, 54.6% were men and 44.5% were women. In the overall structure of stroke cases, the ischemic type was the most common, accounting for 44.8%, followed by the hemorrhagic type (38.6%) and the undifferentiated type (16.6%).

Regional analysis shows that the Nukus district leads in the number of registered patients, with 985 cases identified. In comparison, Kegeyli (166 cases), Amudarya (113 cases), and Muynak (65 cases) reported relatively fewer cases. However, in the Amudarya and Muynak districts, the incidence of stroke among women was higher, comprising 51.3% and 52.3% of the total, respectively. This

indicates that social and healthcare-related factors may have a stronger impact on women's health in these areas.

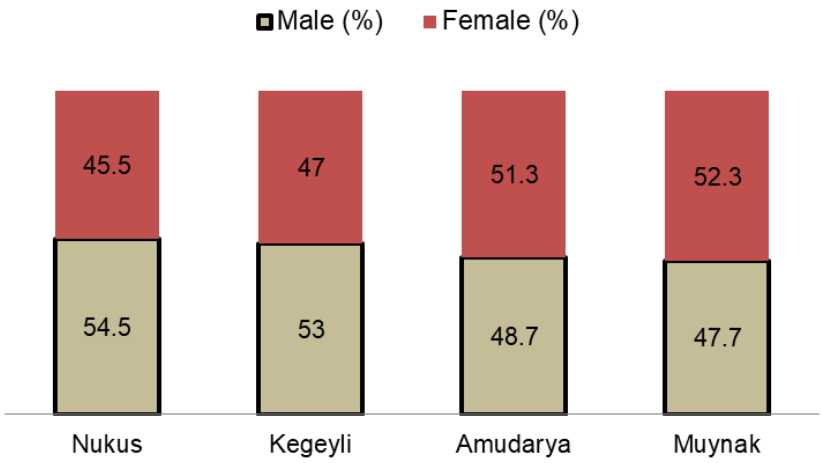

Fig. 1. Sex-based distribution of stroke patients in four districts

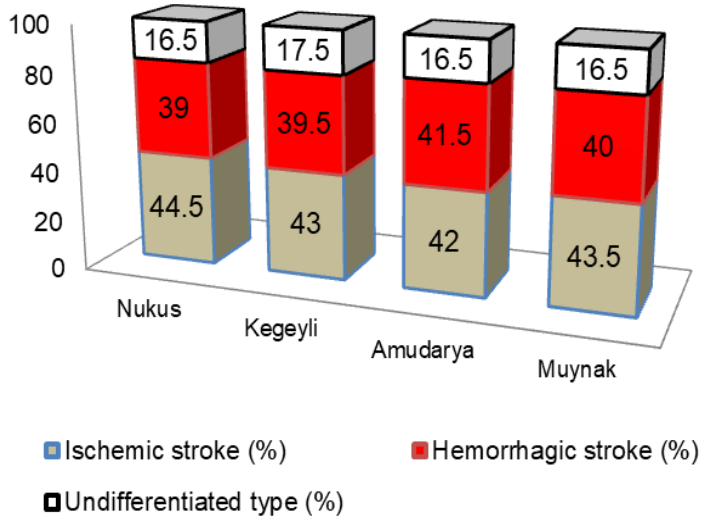

Fig. 2. Distribution of stroke types by districts

The study revealed that stroke occurred most frequently in the 50-79 age range, with the 60-69 age group identified as the most vulnerable period. Within this age group, stroke was observed in 35.9% of men and 29.7% of women. The higher incidence in this range is primarily associated with the progression of chronic cardiovascular diseases, arterial hypertension, diabetes, and metabolic syndrome,

which are recognized as major contributing factors to stroke risk. Although ischemic stroke predominates in the region, the high proportion of hemorrhagic stroke cases (38.6%) suggests that arterial hypertension, vascular wall fragility, and limitations in emergency medical response systems remain significant problems.

In general, the data demonstrate regional disparities, gender differences, and age-related risk groups in stroke distribution across the Priaralye region. These findings provide an essential epidemiological basis for developing targeted prevention strategies, improving early diagnosis, and enhancing public health programs aimed at reducing stroke incidence in the region.

4. Conclusion

1. The results indicate that in the Priaralye (Republic of Karakalpakstan) region, stroke incidence shows significant variation by sex and age. The 50–79 age group, particularly individuals aged 60–69, represents the highest-risk category, largely due to chronic cardiovascular diseases and arterial hypertension.

2. Regional analysis revealed that stroke incidence was highest in Nukus district, while in the Amudarya and Muynak districts, women exhibited a relatively higher prevalence. This suggests that social and healthcare-related factors may have a greater impact on women's health in these areas.

3. The high proportion of hemorrhagic strokes (38.6%) demonstrates insufficient control of arterial hypertension and vascular fragility in the region. These findings underscore the need to strengthen prevention strategies, improve early diagnosis, and enhance rehabilitation and public health programs to reduce stroke incidence.

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