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## A DECADE-LONG DYNAMICS AND TERRITORIAL DIFFERENCES IN CATARACT MORBIDITY IN AZERBAIJAN, 2016-2025

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The study is based on official medical statistics and population data of the Republic of Azerbaijan for the period 2016-2025, accounting for gender, age, and territorial distribution. The absolute number of registered and newly diagnosed cases was determined, as well as prevalence and incidence rates per 100.000 corresponding population. Linear regression analysis was used to calculate the regression coefficient, 95 % confidence interval,  $R^2$ , and significance level; differences between adjacent years were assessed using Pearson's  $\chi^2$  test. The study established an increase in prevalence over the study period by 70.8 % (from 16.850 to 28.783 cases) and a 3.6-fold increase in incidence (from 4.402 to 15.867 cases). A significant positive trend ( $p < 0.001$ ) with a sharp rise in 2022 was identified. Statistically significant territorial (an increase in the share of Baku from 28.4 % to 43.5 %,  $p = 0.011$ ) and gender (female predominance,  $p < 0.001$ ) differences were established. The obtained results indicate an increasing burden of cataract with pronounced territorial and gender-age heterogeneity, which must be considered when planning ophthalmological care.

**Key words:** cataract, prevalence, incidence, epidemiology, Azerbaijan, territorial distribution, gender differences.

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## ДЕСЯТИРІЧНА ДИНАМІКА І ТЕРИТОРІАЛЬНІ ВІДМІННОСТІ ЗАХВОРЮВАНOSTІ НА КАТАРАКТУ В АЗЕРБАЙДЖАНІ, 2016–2025

Дослідження ґрунтується на даних офіційної медичної статистики та чисельності населення Азербайджанської Республіки за період 2016–2025 рр., з урахуванням статі, віку та територіального розподілу. Визначали абсолютну кількість зареєстрованих та вперше діагностованих випадків, а також показники загальної та вперше діагностованої захворюваності на 100 тис. відповідного населення. Для розрахунків застосовували лінійний регресійний аналіз із розрахунком коефіцієнта регресії, 95 % довірчого інтервалу,  $R^2$  та рівня значущості; відмінності між сусідніми роками оцінювали за критерієм  $\chi^2$  Пірсона. Дослідженням встановлено зростання превалентності за досліджуваний період на 70,8 % (з 16 850 до 28 783 випадків), інцидентності – у 3,6 раза (з 4 402 до 15 867 випадків); виявлено значущу позитивну тенденцію ( $p < 0,001$ ) із різким зростанням у 2022 р. Встановлено статистично значущі територіальні (зростання частки м. Баку з 28,4 % до 43,5 %,  $p = 0,011$ ) та гендерні (переважання жінок,  $p < 0,001$ ) відмінності. Отримані результати свідчать про зростання тягаря катаракти з вираженою територіальною та гендерно-віковою неоднорідністю, що потребує врахування під час планування офтальмологічної допомоги.

**Ключові слова:** катаракта, превалентність, інцидентність, епідеміологія, Азербайджан, територіальний розподіл, гендерні відмінності.

According to the World Health Organization's (WHO) "World report on vision", population aging continues to maintain this pathology's status as one of the priority areas of ophthalmological care [15]. Cataract is the most common cause of blindness. According to meta-analysis by the Vision Loss Expert Group of the Global Burden of Disease Study, in 2020 cataract was the cause of blindness in 17.0 million people, and of moderate to severe visual impairment in an additional 83.5 million people [13]. The only effective and universally recognized method of treating cataract is surgical intervention, which is why early diagnosis and timely referral for surgery are key tools for the prevention of blindness [14].

The relevance of studying cataract epidemiology is determined not only by its significance as a cause of blindness, but also by the continuing increase in the burden of this disease worldwide. Thus, according to data from the Global Burden of Disease (GBD) study [9], the number of cataract cases worldwide increased more than 2.5 fold – from 32.8 to 83 million between 1990 and 2021 [7]. It has been noted that the increase in the absolute number of cases in occurring against a background of declining age-standardized prevalence and disease burden indicators [8, 9, 14]. Particular attention

should be paid to the gender difference consistently confirmed by major epidemiological studies: the prevalence and burden of cataract in women exceed those in men in all regions of the world and in all age groups over 50 years [4, 13].

Analysis at the level of administrative-territorial units makes it possible to identify regions with highest and lowest incidence rates. As shown in a number of foreign studies, territorial difference reflect not so much true heterogeneity of incidence as the unevenness in the availability of specialized ophthalmological care between urban and rural regions [1, 2].

Despite the large number of GBD estimates, the epidemiological situation regarding cataract in the countries of the South Caucasus, including the Republic of Azerbaijan, remains insufficiently studied on the basis of national data. In Azerbaijan, individual studies have previously been conducted addressing the prevalence and certain epidemiological aspects of this pathology [2]. However, these covered earlier study periods. Most publications on neighboring countries are limited to general population-based estimates of cataract prevalence and clinical studies of individual aspects of the disease [1, 10, 12].

Thus, the present study aims to fill gaps in cataract epidemiology and represents a relevant task for building an evidence base for a national blindness prevention strategy in Azerbaijan.

**The purpose** of the study was to analyze the year-by-year dynamics (2016–2025) of cataract prevalence and incidence among the adult population of the Republic of Azerbaijan, taking into account gender-age structure and territorial differences.

**Materials and methods.** This study is a retrospective descriptive epidemiological analysis based on data from official medical and demographic statistics of the Republic of Azerbaijan over a ten-year period (2016–2025). The material for the study was data from official medical statistics reporting form No12 (tables 3000/4000, line 7.2 “Cataract”, ICD-10 H25-H28), as well as data on the population of the republic, differentiated by administrative-territorial units, gender, and age groups (“18–29 years” and “30 years and older”).

In accordance with the administrative-territorial division of the country, all territorial units were grouped into the following categories: the city of Baku – the capital or the republic; cities of republican subordination (Ganja, Sumgait, Mingachevir, Shirvan, Naftalan, Khankendi), districts (57 administrative districts of the country), and the Nakhichevan Autonomous Republic (AR) (7 administrative districts).

For each year of observation, the absolute number of registered and newly diagnosed cataract cases was determined, and prevalence and incidence rates per 100.000 population of the corresponding age group were calculated. Gender- and age-specific rates were calculated separately for men and women in each of the studied age categories (“18–29 years” and “30 years and older”) by dividing the corresponding number of cataract cases by the population of the corresponding gender-age group, followed by multiplication by 100.000.

To assess the overall ten-year trend of the indicators, in accordance with generally accepted methods of biomedical statistics [6], least-squares regression analysis was applied, with calculation of the regression coefficient ( $\beta$ ), its 95 % confidence interval (CI), and the coefficient of determination ( $R^2$ ). Pearson's  $\chi^2$  test was used for pairwise comparison of indicators between adjacent years. The critical level of significance was set at  $p < 0.05$ . Data

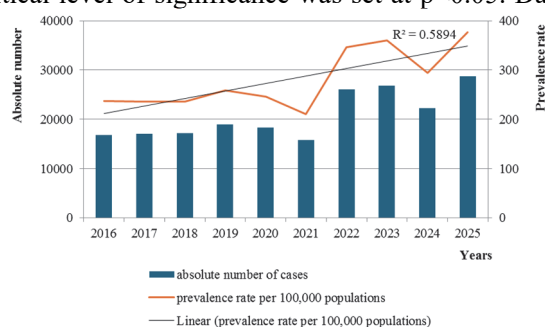


Fig. 1. Ten-year dynamics of cataract prevalence among the population aged over 18 years in Azerbaijan, 2016–2025: absolute number of registered cases and prevalence rate per 100.000 populations.

processing, statistical analysis, and visualization were performed using Microsoft Excel.

**Ethical aspects.** The study was conducted on the basis of aggregated, de-identified data from state statistics, not containing patient's personal data. In this regard, obtaining patient's informed consent and approval of the study by an ethical committee neither were nor required.

**Results of the study.** A total of 207.978 cataract cases were registered among the adult population of the Republic of Azerbaijan (in the age groups “18–29 years” and “30 years and older”). The minimum annual value was recorded in 2021 (15.726 cases), and the maximum in 2025 (28.783 cases). The total number of registered cataract cases increased by 70.8 % (from 16.850 cases in 2016 to 28.783 in 2025). The increase in the number of newly diagnosed cataract cases over this period was more pronounced – from 4.402 cases in 2016 to 15.867 in 2025 (a 3.8-fold increase). Throughout 2016–2021, prevalence rate remained relatively stable: the average annual number of all registered cases was 17.337 (237.1 per 100.000 of the corresponding population) (Fig. 1).

Linear regression analysis for this six-year period revealed no statistically significant trend ( $p > 0.05$ ); statistically significant differences between adjacent years were established only for the transition from 2018 to 2019 (Pearson's  $\chi^2$  test,  $p < 0.05$ ). Starting from 2022, pronounced rise was recorded: the average annual number of cases for 2022–2025 increased to 25.990 (344.3 per 100.000 of the corresponding population), i.e. 1.5 times higher than the level of the preceding study period. Linear regression of the prevalence rate over the entire ten-year period demonstrates a statistically significant positive trend: the increase amounted to 15.3 cases per 100.000 population per year (95 % CI 4.9–25.6),  $R^2 = 0.59$ ,  $p = 0.01$ ). The incidence rate demonstrates a more pronounced and statistically more stable positive dynamic: linear regression over the ten-year period revealed an increase of 16.5 cases per 100.000 population per year (95 % CI 11.1–21.9,  $p < 0.05$ ). At the same time, the coefficient of determination ( $R^2 = 0.86$ ) is significantly higher than for prevalence, indicating a more consistent pattern of growth (Fig. 2). As with prevalence, the transition from 2021 to 2022 proved most significant – and almost twofold increase in the indicator ( $\chi^2 = 2016.0$ ,  $p < 0.001$ ).

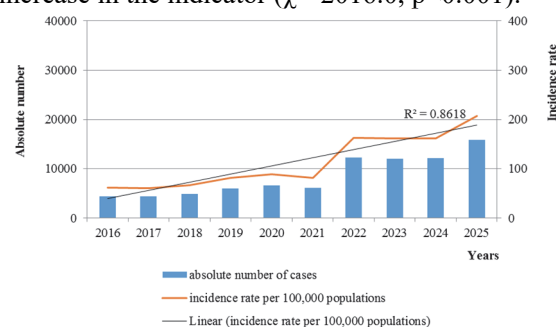


Fig. 2. Ten-year dynamics of newly detected cataract among the population aged over 18 years in Azerbaijan, 2016–2025: absolute number of newly diagnosed cases and incidence rate per 100.000 populations.

Thus, the higher growth rate and higher linearity of the incidence trend compared to prevalence statistically confirm that the identified shift is not a random fluctuation but reflects a stable tendency

toward an increase in the share of newly diagnosed cases within the overall disease structure. The distribution of cases among territorial groups changed significantly over the study period (Table 1).

Table 1

**Cataract prevalence by territorial groups of the Republic of Azerbaijan for the period 2016–2025, absolute number (% of national total)**

| Year | Baku City       | Cities of republican subordination | Districts        | Nakhichevan AR | Total  |
|------|-----------------|------------------------------------|------------------|----------------|--------|
| 2016 | 4 784 (28.4 %)  | 2 862 (17.0 %)                     | 8 925 (53.0 %)   | 279 (1.6 %)    | 16 850 |
| 2017 | 4 680 (27.5 %)  | 2 691 (15.8 %)*                    | 9 261 (54.5 %)*  | 361 (2.1 %)*   | 16 993 |
| 2018 | 4 483 (26.1 %)  | 2 461 (14.3 %)*                    | 9 551 (55.7 %)*  | 675 (3.9 %)*   | 17 170 |
| 2019 | 5 227 (27.5 %)  | 3 124 (16.4 %)*                    | 10 132 (53.3 %)* | 530 (2.8 %)*   | 19 013 |
| 2020 | 5 081 (27.8 %)  | 2 831 (15.5 %)*                    | 9 808 (53.7 %)   | 547 (3.0 %)    | 18 267 |
| 2021 | 4 793 (30.5 %)  | 2 132 (13.6 %)*                    | 8 176 (52.0 %)*  | 625 (4.0 %)*   | 15 726 |
| 2022 | 7 105 (27.2 %)  | 802 (3.1 %)*                       | 17 798 (68.2 %)* | 387 (1.5 %)*   | 26 092 |
| 2023 | 8 426 (31.4 %)  | 2 460 (9.2 %)*                     | 15 580 (58.0 %)* | 383 (1.4 %)    | 26 849 |
| 2024 | 7 871 (35.4 %)  | 2 030 (9.1 %)                      | 11 937 (53.7 %)* | 397 (1.8 %)*   | 22 235 |
| 2025 | 12 524 (43.5 %) | 893 (3.1 %)*                       | 14 842 (51.6 %)* | 524 (1.8 %)    | 28 783 |

Note: \* An asterisk marks the share of a territorial group in a given year that is statistically significantly different from the share of the same group in the previous year (Pearson's  $\chi^2$  test,  $p < 0.05$ ).

Thus, the share of Baku city increased from 28.4 % in 2016 to 43.5 % in 2025 (95 % CI 0.40–2.26;  $R^2=0.58$ ;  $p=0.011$ ). For the group of cities of republican subordination, linear regression showed a statistically significant decreasing trend (95 % CI from -2.25 to -0.65;  $R^2=0.65$ ;  $p=0.003$ ). The share of districts did not show a statistically significant value over the entire period ( $R^2=0.02$ ;  $p=0.703$ ). Moreover,

as can be seen from Table 1, the share structure remained unstable from year to year. The linear trend of the Nakhichevan AR share is also statistically insignificant ( $R^2=0.10$ ;  $p=0.384$ ).

Regarding newly diagnosed cataract cases, the linear trend of Baku's share over the entire period did not reach the level of statistical significance (95 % CI from -0.02 to 4.17;  $p=0.052$ ) (Table 2).

Table 2

**Cataract incidence by territorial groups of the Republic of Azerbaijan for the period 2016–2025, absolute number (% of national total)**

| Year | Baku City       | Cities of republican subordination | Districts       | Nakhichevan AR | Total  |
|------|-----------------|------------------------------------|-----------------|----------------|--------|
| 2016 | 1 199 (27.2 %)  | 826 (18.8 %)                       | 2 335 (53.0 %)  | 42 (1.0 %)     | 4 402  |
| 2017 | 1 016 (23.1 %)* | 787 (17.9 %)                       | 2 470 (56.3 %)* | 116 (2.7 %)*   | 4 389  |
| 2018 | 892 (18.3 %)*   | 827 (16.9 %)                       | 2 944 (60.3 %)* | 223 (4.5 %)*   | 4 886  |
| 2019 | 1 558 (26.1 %)* | 712 (11.9 %)*                      | 3 308 (55.4 %)* | 398 (6.6 %)*   | 5 976  |
| 2020 | 1 010 (15.3 %)* | 730 (11.1 %)                       | 4 776 (72.4 %)* | 82 (1.2 %)*    | 6 598  |
| 2021 | 1 352 (22.0 %)* | 391 (6.4 %)*                       | 4 233 (68.8 %)  | 172 (2.8 %)*   | 6 148  |
| 2022 | 3 360 (27.3 %)* | 179 (1.5 %)*                       | 8 587 (69.6 %)  | 193 (1.6 %)*   | 12 319 |
| 2023 | 4 195 (34.9 %)* | 1 075 (8.9 %)*                     | 6 628 (55.1 %)* | 124 (1.1 %)*   | 12 022 |
| 2024 | 3 539 (29.0 %)* | 1 056 (8.6 %)                      | 7 449 (61.0 %)* | 174 (1.4 %)*   | 12 218 |
| 2025 | 6 543 (41.2 %)* | 348 (2.2 %)*                       | 8 779 (55.4 %)* | 197 (1.2 %)*   | 15 867 |

Note: \* An asterisk marks the share of a territorial group in a given year that is statistically significantly different from the share of the same group in the previous year (Pearson's  $\chi^2$  test,  $p < 0.05$ ).

For cities of republican subordination, a statistically significant sustained decline in their role in detecting new cataract cases was established (95 % CI from -2.59 to -0.75;  $R^2=0.75$ ;  $p=0.001$ ). The share of districts, overall, as in the prevalence analysis, did not show a significant linear trend over the entire period ( $R^2=0.03$ ;  $p=0.630$ ), however, statistically significant changes were noted for individual years.

The share of the Nakhichevan AR in the structure of newly diagnosed cataract cases remained low and fluctuated in the range of 1.0–6.6 % without a statistically significant linear trend over the entire

period (95 % CI from -0.69 to 0.245;  $R^2=0.14$ ;  $p=0.297$ ).

The study established that cataract incidence was characterized by a moderate predominance of women, more pronounced in the older age group ( $\chi^2=11.98$ ;  $p < 0.001$ ) (Fig. 3).

**Discussion.** A similar pattern, although not statistically significant ( $\chi^2=2.17$ ;  $p=0.141$ ), is also observed for newly diagnosed cataract cases. The data obtained on the dynamics of cataract prevalence and incidence in the Republic of Azerbaijan over the period 2016–2025 are generally consistent with the

global trend toward an increasing burden of this pathology, recorded in the most recent systematic GBD analyses [5, 13]. The most notable feature of our data is the sharp structural shift at the 2021–2022 transition. Such abrupt changes in epidemiological indicators are usually associated with the influence of external factors rather than a true increase in incidence. Similar data were described by foreign authors [3] in relation to the COVID–19 pandemic.

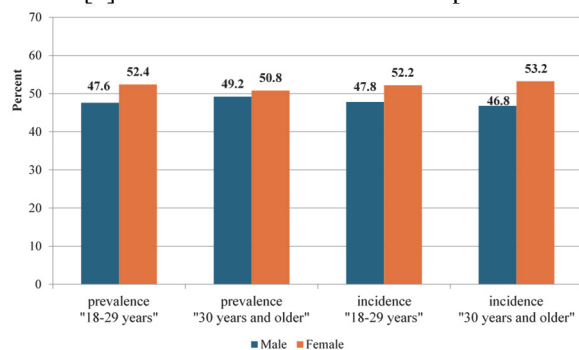


Fig.3. Distribution by gender and age group of cataract prevalence and incidence in the Republic of Azerbaijan for the period 2016–2025 (in %).

The gender structure of morbidity we obtained, with a moderate but statistically significant predominance of the female share (52.4 % in the “18–29 years” age category and 50.8 % in the “30 years and older” age category for prevalence,  $\chi^2=11.98$ ,

$p<0.001$ ), is consistent with trends described in a large meta-analysis based on GBD 2019 data, which recorded a widespread predominance of women among cataract patients in many regions of the world [4]. A Finnish population-based cohort analysis, based on 11 years of follow-up, also notes significant influence of socio-demographic factors, including gender, on the frequency of both cataract development and seeking surgical treatment for it [11].

The relatively high proportion of cases in the “18–29 years” age group deserves separate discussion. In classical epidemiological works, cataract is considered predominantly as an age-associated pathology of persons over 50–60 years [13, 15].

The territorial heterogeneity in the distribution of cases, namely the steady growth of the share in Baku against the backdrop of a decline in the share of cities of republican subordination, probably reflects not so much true differences in incidence as the uneven concentration of diagnostic capacity and specialized ophthalmological care, which is consistent with the variability in the detection of cataract-related blindness noted in the works of researchers from neighboring countries [1, 12].

It should also be noted that the patterns we identified are consistent with the results of earlier studies [2].

## Conclusions

1. During the period 2016–2025, a statistically significant increase was noted in the prevalence and newly diagnosed incidence of cataract: the increase amounted to 15.3 (95 % CI 4.9–25.6;  $R^2=0.59$ ;  $p=0.01$ ) and 16.5 cases per 100.000 populations per year (95 % CI 11.1–21.9;  $R^2=0.86$ ;  $p<0.001$ ), respectively.

2. Pronounced territorial heterogeneity was identified (the share of Baku in the structure of registered cases increased from 28.4 % in 2016 to 43.5 % in 2025 ( $p=0.011$ ), with a statistically significant decrease in the share of cities of republican subordination ( $p=0.003$  for prevalence,  $p=0.001$  for incidence).

3. A moderate predominance of women among registered cataract cases was established, statistically significant for prevalence ( $\chi^2=11.98$ ,  $p<0.001$ ) and not significant for incidence ( $\chi^2=2.17$ ,  $p<0.141$ ).

*Prospects for further research. Further work involves a transition from studying aggregated data to individual-level analysis, which may allow clarification of the nosological structure of cases. Also promising is the development of predictive models of the burden of cataract in the Republic of Azerbaijan with the aim of optimizing the planning of surgical care resources.*

## References

1. Tikhonchuk NA, Greben NK, Skripnichenko ID, Zadorozhna AI, Gavril'yak IV. Efektyvnist khirurhichnoho likuvannya uskladnenoyi katarakty: kliniko-funktsionalnyy analiz. Arkhiv oftalmolohiyi Ukrainy. 2024;12(3):170–175. doi: 10.22141/2309-8147.12.3.2024.392. [in Ukrainian]
2. Agayeva RB, Rustamova NM, Nazarli JA. Azərbaycanda yaşlı əhali arasında ümumi oftalmopatologiyanın dinamikasının öyrənilməsinə və onun azaldılması yollarının axtarışına dair. [On the study of the dynamics of general ophthalmopathology among the elderly population in Azerbaijan and the search for ways to reduce it]. The Azerbaijan Journal of Ophthalmology. 2023;44(4):15–21. doi: <https://doi.org/10.30546/2709-4634.2023.44.015>. [In Azerbaijani]
3. Das AV, Reddy JC. Year one of COVID-19 pandemic: effect of lockdown and unlock phases on cataract surgery at a multi-tier ophthalmology network. Indian J Ophthalmol. 2021;69(10):2818–2823. doi:10.4103/ijo.IJO\_1568\_21.
4. Fang R, Yu YF, Li EJ, Lv NX, Liu ZC, Zhou HG, et al. Global, regional, national burden and gender disparity of cataract: findings from the global burden of disease study 2019. BMC Public Health. 2022;22(1):2068. doi:10.1186/s12889-022-14491-0.
5. GBD 2021 Diseases and Injuries Collaborators. Global incidence, prevalence, years lived with disability (YLDs), disability-adjusted life-years (DALYs), and healthy life expectancy (HALE) for 371 diseases and injuries in 204 countries and territories and 811 subnational locations, 1990–2021: a systematic analysis for the Global Burden of Disease Study 2021. Lancet. 2024;403(10440):2133–2161. doi:10.1016/S0140-6736(24)00757-8.
6. Glantz S. A. Primer of Biostatistics. 7th ed. New York: McGraw-Hill Medical. 2011. 320 p.
7. Han X, Zou M, Liu Z, Sun Y, Young CA, Zhenget D. al. Time trends and heterogeneity in the disease burden of visual impairment due to cataract, 1990–2019: A global analysis. Front Public Health. 2023;11:1140533. doi:10.3389/fpubh.2023.1140533.
8. Jiang X, Xu B, Zhai J, Huang S, Cheng H, Ma L, et al. Global trends in cataract burden: a 30-year epidemiological analysis and prediction of 2050 from the Global Burden of Disease 2021 study. Br J Ophthalmol. 2026;110(2):139–147. doi:10.1136/bjo-2025-327776.

9. Lin L, Liang Y, Jiang G, Gan Q, Yang T, Liao P, et al. Global, regional, and national burden of cataract: A comprehensive analysis and projections from 1990 to 2021. PLoS One 2025;20(6): e0326263. <https://doi.org/10.1371/journal.pone.0326263>
10. Mirza E, Mirza GD, Oltulu R, Okka M, Ozkagnici A. The Frequency and Causes of Blindness in a Rural Region of Central Anatolia of Turkey. Eurasian J Med. 2019;51(3):242-246. doi: 10.5152/eurasianjmed.2019.18312.
11. Purola PKM, Nättinen JE, Ojamo MUI, Rissanen HA, Koskinen SVP, et al. Prevalence and 11-Year Incidence of Cataract and Cataract Surgery and the Effects of Socio-Demographic and Lifestyle Factors. Clin Ophthalmol. 2022;16:1183-1195. doi:10.2147/OPTH.S355191.
12. Shahdadi H, Aminifard MN, Balouchi A, Rafiemanesh H, Allahyari J. Frequency of Cataract in Iran: A Meta-Analysis and Systematic Review. Middle East Afr J Ophthalmol. 2018;25(1):40-46. doi:10.4103/meajo.MEAJO\_300\_17.
13. Vision Loss Expert Group of the Global Burden of Disease Study; GBD 2019 Blindness and Vision Impairment Collaborators. Global estimates on the number of people blind or visually impaired by age-related macular degeneration: a meta-analysis from 2000 to 2020. Eye (Lond). 2024;38(11):2070-2082. doi: 10.1038/s41433-024-03050-z.
14. Wang D, Tang T, Li P, Zhao J, Shen B, Zhang M. The global burden of cataracts and its attributable risk factors in 204 countries and territories: a systematic analysis of the global burden of disease study. Front Public Health. 2024;12:1366677. doi:10.3389/fpubh.2024.1366677.
15. World Health Organization. World report on vision. Geneva: WHO; 2019.

**Conflict of interest.** The authors have no conflicts of interest to declare.

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# CHANGES IN THE ACTIVITY OF NITRIC OXIDE PRODUCTION AND THE CONTENT OF CORTISOL IN THE BLOOD OF PATIENTS IN THE ACUTE PERIOD OF MYOCARDIAL INFARCTION

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Current research is devoted to studying the role of nitric oxide and NO synthase in ensuring the functioning of the cardiovascular system. The purpose of the study was to examine changes in the activity of different isoforms of NO synthase (inducible, endothelial and neuronal), the content of nitrites, peroxynitrites and cortisol in the blood of patients in the acute period of myocardial infarction without Q wave and Q-infarction. The development of Q-wave infarction is accompanied by an increase in the production of nitric oxide in the blood from the L-arginine-dependent pathway of its formation, which leads to the accumulation of active nitrogen forms, while in myocardial infarction without a Q wave there is no increase in the production of nitric oxide in the blood from the L-arginine-dependent pathway of its formation, however, the concentration of active nitrogen forms in the blood increases more markedly.

**Key words:** Q-wave infarction, non-Q-wave infarction, nitric oxide, cortisol, NO synthase.

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## ЗМІНИ АКТИВНОСТІ ПРОДУКЦІЇ ОКСИДУ АЗОТУ ТА ВМІСТ КОРТИЗОЛУ У КРОВІ ПАЦІЄНТІВ У ГОСТРОМУ ПЕРІОДІ ІНФАРКТУ МІОКАРДА

Сучасні дослідження присвячені вивченню ролі оксиду азоту та NO-синтази у забезпеченні функціонування серцево-судинної системи. Метою даної роботи було вивчити зміни активності різних ізоформ NO-синтази (індуцибельної, ендотеліальної та нейрональної), вміст нітритів, пероксинітритів та кортизолу у крові пацієнтів у гострому періоді інфаркту міокарда без зубця Q та Q-інфаркту. Отримані нами результати свідчать про зростання продукції оксиду азоту в крові від L-аргінін-залежного шляху його утворення при розвитку Q-інфаркту, що призводить до накопичення активних форм азоту, в той час як при інфаркті міокарда без зубця Q не відбувається зростання продукції оксиду азоту в крові від L-аргінін-залежного шляху його утворення, проте більш виражено підвищується концентрація активних форм азоту в крові.

**Ключові слова:** Q-інфаркт, не-Q-інфаркт, оксид азоту, кортизол, NO-синтаза.

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Cardiovascular disease (CVD) is a global health problem. According to WHO (2019), about 17.9 million people died from CVD, which is the leading cause of death worldwide. 197.2 million people worldwide suffer from ischemic heart disease (IHD). The reasons for the continued increase in the

prevalence of CHD are aging, as well as an increase in controllable CVD risk factors. CVD and CHD (myocardial infarction) remain in the spectrum of diseases that threaten life, are a cause of disability and reduced work capacity. With the beginning of the Russian armed aggression against Ukraine, the