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## ANALYSIS OF THE INCIDENCE OF MYOCARDIAL INFARCTION IN THE CARDIOLOGY CENTER IN SHYMKENT

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### Abstract

**Background.** Cardiovascular disease (CVD) is the leading cause of morbidity and mortality worldwide [11]. An estimated 23.6 million people a year will die from cardiovascular disease by 2030 [6]. Over the past three decades, there has been a sharp decline in mortality from cardiovascular diseases among both men and women, especially in the age group > 65 years old [7].

**The aim of the work** is to study the incidence of myocardial infarction in the Cardiology Center in Shymkent.

**Materials and methods.** In the course of the study, the analysis of statistical data of the Cardiology Department of the Cardiology Center in Shymkent was carried out. The following indicators were analyzed for the period 2017-2019: incidence, re-hospitalization rate, bed-days, etc.

**Results.** In 2017-2019, 6230 patients were admitted to the Cardiology Department of the Cardiology Center. In 2017, the number of patients admitted with myocardial infarction was 1528 (77.6), in 2018 - 1700 (86.3), in 2019 - 1562 (79.3). In 2018, there is a tendency towards an increase in the number of admitted patients with myocardial infarction by 10% compared to 2017 and a decrease by 8% compared to 2019. Over the years under study (2017-2019), 712 patients with recurrent myocardial infarction were admitted to the Cardiology Department of the Cardiology Center. In the dynamics, there is a tendency to an increase in the rate of admissions of patients with recurrent myocardial infarction by 4.2 times: from 3.9 (78 cases) in 2017 to 16.7 (329 cases) in 2018. There is a slight decrease in this indicator to 15.4 (305 cases) in 2019.

**Conclusion.** Thus, in the Cardiology Center in Shymkent, myocardial infarction occurs in 97% of cases of the total number of cardiovascular diseases. There has been a decrease in bed-days of patients with myocardial infarction from 8.8 in 2017 to 7.9 in 2019. Most often, patients with myocardial infarction are readmitted after stenting (62.5%).

**Key words:** myocardial infarction, cardiovascular diseases, ischemic heart disease.

### Резюме

## АНАЛИЗ ЗАБОЛЕВАЕМОСТИ ИНФАРКТА МИОКАРДА (НА ПРИМЕРЕ КАРДИОЛОГИЧЕСКОГО ЦЕНТРА Г. ШЫМКЕНТ)

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**Актуальность.** Сердечно-сосудистые заболевания (ССЗ) являются ведущей причиной заболеваемости и смертности во всем мире [11]. По оценкам, к 2030 году от сердечно-сосудистых заболеваний будут умирать 23,6 миллиона человек в год [6]. За последние три десятилетия произошло резкое снижение смертности от сердечно-сосудистых заболеваний как среди мужчин, так и среди женщин, особенно в возрастной группе > 65 лет [7].

**Целью** работы является изучение распространенности инфаркта миокарда в Кардиологическом центре г.Шымкент.

**Материалы и методы исследования.** В ходе исследования был проведен анализ статистических данных кардиологического отделения городского кардиологического центра г.Шымкент. Проанализированы следующие показатели за период 2017-2019 годы: распространенность, уровень повторной госпитализации, койко-дней и т.д.

**Результаты исследования.** За 2017-2019 годы в кардиологическое отделение городского кардиологического центра поступило 6230 пациентов. В 2017 году количество больных, поступивших с инфарктом миокарда составило 1528 (77,6), в 2018 году – 1700 (86,3), в 2019 году – 1562 (79,3). В 2018 году наблюдается тенденция к повышению поступивших больных с инфарктом миокарда на 10% по сравнению с 2017 годом и снижению на 8% по сравнению с 2019 годом. За исследуемые годы (2017-2019 годы) в кардиологическое отделение кардиоцентра поступило 712 пациентов с повторным инфарктом миокарда. В динамике наблюдается тенденция к увеличению уровня случаев поступления больных с повторным инфарктом миокарда в 4,2 раза: с 3,9 (78 случаев) в 2017 году до 16,7 (329 случаев) в 2018 году. Отмечается незначительное снижение этого показателя до 15,4 (305 случаев) в 2019 году.

**Заключение.** Таким образом, в кардиоцентре г.Шымкент инфаркт миокарда встречается в 97% случаев от общего количества случаев болезней системы кровообращения. Отмечается снижение количества дней пребывания в стационаре пациентов с инфарктом миокарда с 8,8 в 2017 году до 7,9 в 2019 году. Чаще всего, пациенты с инфарктом миокарда повторно поступают после стентирования (62,5%).

**Ключевые слова:** инфаркт миокарда, сердечно-сосудистые заболевания, ишемическая болезнь сердца.

Түйіндеме

## **МИОКАРД ИНФАРКТИСІНІҢ АУРУШАҢДЫҒЫН ТАЛДАУ (ШЫМКЕНТ Қ. КАРДИОЛОГИЯЛЫҚ ОРТАЛЫҒЫ МЫСАЛЫНДА)**

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**Өзектілігі.** Жүрек-қан тамырлары аурулары (ЖҚА) бүкіл әлемде сырқаттанушылық пен өлімнің басты себебі болып табылады [11]. 2030 жылға қарай жүрек-қан тамырлары ауруларынан жылына 23,6 миллион адам қайтыс болады деген болжам бар [6]. Соңғы үш онжылдықта ерлер мен әйелдер арасында, әсіресе > 65 жас тобында жүрек-қан тамырлары ауруларынан болатын өлім-жітімнің күрт төмендеуі байқалды [7].

**Жұмыстың мақсаты** Шымкент қаласының кардиологиялық орталығында миокард инфарктісінің таралуын зерттеу.

**Зерттеу материалдары мен әдістері.** Зерттеу барысында Шымкент қалалық кардиологиялық орталығының кардиологиялық бөлімшесінің статистикалық деректеріне талдау жүргізілді. 2017-2019 жылдар кезеңіндегі келесі көрсеткіштер талданды: ауруының таралуы, қайта емдеуге жатқызу деңгейі, төсек-күндер және т. б.

**Зерттеу нәтижелері.** 2017-2019 жылдары Қалалық кардиологиялық орталықтың кардиологиялық бөліміне 6230 пациент түсті. 2017 жылы миокард инфарктімен ауыратындар саны 1528 (77,6), 2018 жылы – 1700 (86,3), 2019 жылы – 1562 (79,3) құрады. 2018 жылы миокард инфарктісі бар науқастардың 2017 жылмен салыстырғанда 10% - ға арту және 2019 жылмен салыстырғанда 8% - ға төмендеу үрдісі байқалады. Зерттеліп отырған жылдары (2017-2019 жылдар) кардиоорталықтың кардиологиялық бөлімшесіне қайталанған миокард инфарктісі бар 712 пациент келіп түсті. Динамикада миокард инфарктісі қайталанған науқастардың түсу жағдайларының деңгейінің 4,2 есеге ұлғаю үрдісі байқалады: 2017 жылғы 3,9 (78 жағдайдан) 2018 жылы 16,7 (329 жағдайға) дейін. Бұл көрсеткіштің 2019 жылы 15,4 (305 жағдайға) дейін аздап төмендегені байқалады.

**Қорытынды.** Осылайша, Шымкент қаласының кардиологиялық орталығында миокард инфарктісі қан айналымы жүйесі ауруларының жалпы санының 97% - ында кездеседі. Миокард инфарктісі бар пациенттердің төсек-күндерінің 2017 жылғы 8,8-ден 2019 жылы 7,9-ға дейін төмендегені байқалады. Көбінесе, миокард инфарктісі бар пациенттер стенттеуден кейін қайта түседі (62,5%).

**Түйінді сөздер:** миокард инфарктісі, жүрек-тамыр аурулары, жүректің ишемиялық ауруы.

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**Background**

Cardiovascular disease (CVD) is the leading cause of morbidity and mortality worldwide [11]. An estimated 23.6 million people a year will die from cardiovascular disease by 2030 [6].

Over the past three decades, there has been a sharp decline in mortality from cardiovascular diseases among both men and women, especially in the age group > 65 years old [7]. In Kazakhstan, there is also a gradual decrease in the mortality rate from CVD: in 2017, mortality from CVD decreased by 2.5 times (174.8 per 100 thousand population) compared to 2009 (416.4 per 100 thousand population) [2]. However, during a pandemic, when the entire public, the media and the healthcare system were focused on the fight to prevent the spread of COVID-19, for example, in Italy, the number of hospitalizations for acute myocardial infarction (AMI) decreased, with a parallel increase in mortality and complications [13].

In Kazakhstan, in 2012-2015, 22,176 adult patients (18> years) with an acute ST-elevation myocardial infarction (STEMI) were hospitalized in hospitals. During this period, hospital mortality was higher in women (13.8%) compared to men (6.8%) (P = 0.0001), in elderly (> 60 years) patients compared with younger patients (≤60 years) (P = 0.0001) [4].

Health Schools are actively developing in Kazakhstan ("School for Patients with Heart Failure", "School for Patients with coronary heart disease and after AMI"), where measures are taken to raise awareness of patients about the disease and its risk factors [1], prevent re-hospitalization patients with myocardial infarction. The main factors in the development of CVD are diabetes mellitus, hypertension, dyslipidemia, obesity, physical inactivity, age, smoking, depression, the presence of autoimmune diseases [14], insomnia [8], including gestational diabetes, preterm labor, hypertensive disorders of pregnancy, treatment of breast cancer among women [7].

In order to improve the organization of medical care for patients with CVD, various patient registries have been introduced in many developed countries. For example, The Korea Acute Myocardial Infarction Registry (KAMIR) [9], International Registry of Pregnancy and Cardiac Disease

(ROPAK) [12], International Society of Heart and Lung Transplantation (ISHLT) registry [10], The Western Denmark Heart Registry (WDHR) [15] etc. The information system "The Acute Coronary Syndrome Registry" has been introduced in Kazakhstan. The registry is intended for registration of patients with CVD for further monitoring of patients, detection and registration of violations of diagnostic algorithms and treatment protocols, the formation of statistical and analytical reporting for prompt management decisions [3].

The aim of the work is to study the incidence of myocardial infarction in the Cardiology Center in Shymkent.

**Materials and methods**

Descriptive study design. The work was carried out on an initiative basis to determine further organizational measures to reduce re-hospitalizations of patients with myocardial infarction.

In the course of the study, the analysis of statistical data of the Cardiology Department of the Cardiology Center in Shymkent was carried out. The following indicators were analyzed for the period 2017-2019: incidence, re-hospitalization rate, bed-days, etc.

**Results**

In 2017-2019, 6230 patients were admitted to the Cardiology Department of the Cardiology Center in Shymkent. In dynamics in 2018 compared to 2017, there is an upward trend: the number of treated patients increased from 1901 cases in 2017 to 2254 cases in 2018, mainly due to an increase in hospitalized patients for emergency care. In 2019 (2075), compared to 2018, the number of treated patients with AMI did not increase, there is a slight decrease due to strict adherence to the rules of hospitalization in the department in the absence of a bed. In 2017, the number of patients admitted with myocardial infarction was 1528 (77.6 per 100 thousand population), in 2018 - 1700 (86.3), in 2019 - 1562 (79.3) (Table 1). In 2018, there is a tendency towards an increase in the number of admitted patients with myocardial infarction by 10% compared to 2017 and a decrease by 8% compared to 2019.

Table 1.

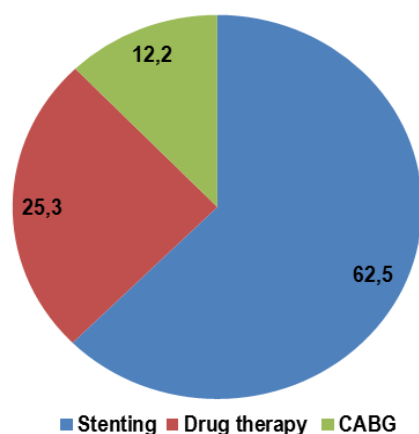
**Hospitalization of patients with myocardial infarction according to the Cardiology Center in Shymkent.**

Indicators	2017	2018	2019
Number of patients admitted with myocardial infarction (the incidence)	1528 (77,6)	1700 (86,3)	1562 (79,3)
Number of re-hospitalization in patients with myocardial infarction (re-hospitalization rate)	78 (3,9)	329 (16,7)	305 (15,4)

In the dynamics, there is a tendency to an increase in the rate of admissions of patients with recurrent myocardial infarction by 4.2 times: from 3.9 (78 cases) in 2017 to 16.7 (329 cases) in 2018. There is a slight decrease in this indicator to 15.4 (305 cases) in 2019. The highest rate of recurrent myocardial infarction is observed in 2018. There is a trend towards a decrease in the number of re-hospitalizations within 1 month for the same diagnosis (4 cases in 2017 and 2 cases in 2019).

In the structure of the main diseases by nosology among those admitted with CVD to the Cardiology Department of the Cardiology Center in 2017-2019, myocardial infarction is in the first place (97% (1596 cases); in the second place is unstable angina 1.3% (37 cases); others account for 1.7%.

Over the years under study (2017-2019), 712 patients with recurrent myocardial infarction were admitted to the Cardiology Department of the Cardiology Center in Shymkent. In the structure of morbidity with recurrent myocardial infarction, in the first place is stenting (62.5%), in the second place is drug therapy (25.3%). The third place of recurrent hospitalization of patients with myocardial infarction is coronary artery bypass grafting (CABG) - 12.2% (Fig. 1).



**Figure 1. Structure of re-hospitalization of patients with myocardial infarction**

Bed-days decreased from 8.8 in 2017 and 8.1 in 2018 to 7.9 in 2019, due to timely invasive intervention and restoration of coronary blood flow, respectively, the number of complicated cases of myocardial infarction is decreasing.

Stable dynamics is observed in the admission of patients from rural areas with myocardial infarction from 2017 to 2019 and is 53% and 52%, respectively, of the total number of admissions. In recent years, along with the modernization of the medical network, there remains the problem of providing qualified personnel in rural areas.

The analysis of the age and sex structure of the treated patients showed that men predominate (69.3%), with the working age from 20-29 years old to 60-69 years old and make up 71.9% of the total number of men in 2018-2019 (1154 out of 1603 respectively). It was found that as the population ages, the incidence of myocardial infarction progressively increases, reaching a maximum at the age of 50-59; the first cases of AMI were observed in men aged 20-29 years 0.4%. Among women who had myocardial infarction, the greatest value is observed in the age

category 70-79 years and is 34.2% of the total number of women admitted with myocardial infarction, the first cases of AMI were observed in women aged 30-39 years 0.4%.

There is a "rejuvenation" of myocardial infarction, which is caused by an unhealthy lifestyle, i.e. bad habits, unhealthy diet, sedentary lifestyle and accumulation of stress, inability to adequately respond to various life situations.

The first cases of AMI were observed in men aged 20-29 years 0.4%. The highest peak in the age and sex structure of patients with myocardial infarction, among men, is observed in the age group 50-59 years; makes up 36.1% of the total number of men who have had myocardial infarction.

The relevance of secondary prevention of myocardial infarction is determined by the high level of its prevalence, premature mortality and persistent disability of the population, as a result of which society bears great economic losses.

In dynamics, the number of trained patients with myocardial infarction increased by 1.3 times: from 1046 in 2017 to 1342 in 2019. In 2017-2019, 740 sessions were held at the Heart School, 3438 patients were trained.

#### Discussion

Almost one third of patients with myocardial infarction in the postinfarction period are hospitalized again within six months due to coronary heart disease, which may be due to an insufficient level of secondary prevention of myocardial infarction. Many patients are unaware of the severity of the disease. After inpatient treatment, the patient leads the same way of life, lives an active life and does not feel sick. This misconception can lead to repeated myocardial infarction. The continuity of treatment is important here. Many, after discharge, do not follow the recommendations of doctors. It is difficult to convince a patient that myocardial infarction is a chronic process and medications should be taken for a long time or even for life. Some researchers have noted a statistically significant reduction in the risk of subsequent myocardial infarction when using a routine invasive strategy of myocardial revascularization during hospitalization, but this strategy was associated with a (almost twice) higher risk of complications associated with revascularization [2]. Dual antiplatelet therapy for more than a year reduces the risk of subsequent myocardial infarction, but increases the risk of major bleeding [5].

The cause of recurrent myocardial infarction after stenting and bypass grafting is the patient's failure to comply with the prescribed therapy after surgery, which leads to the risk of complications in the form of thrombosis. In connection with the creation of a state system for the rehabilitation of patients with myocardial infarction, the problem is currently considered solved for the urban population, in contrast to the rural population. Most of the rural population is mainly engaged in hard physical labor, which leads to the complexity of the rehabilitation of patients with myocardial infarction.

There must be continuity: training should begin during the patient's stay in the hospital, but be sure to continue it at the outpatient stage, using distance learning and monitoring methods.

Life-long secondary prevention of coronary heart disease, aimed at preventing the progression and

exacerbations of the disease and the prevention of late complications of myocardial infarction (heart failure, rhythm disturbances, recurrent myocardial infarctions, sudden death, etc.) begins after the sanatorium. As practice shows, unfortunately, it is more often replaced by dispensary and polyclinic supervision of a local physician with periodic consultation of a cardiologist.

Centralization of all resources in one specialized institution increases the efficiency of specialists' activities; the ability to analyze research results, to effectively use equipment, to integrate the diagnostic and treatment capabilities of the healthcare system is increasing. A multilevel approach at the outpatient stage, complete and adequate rehabilitation contribute to improving the quality of medical care.

**Conclusion.** Thus, in the Cardiology Center in Shymkent, myocardial infarction occurs in 97% of cases of the total number of cardiovascular diseases. There has been a decrease in bed-days of patients with myocardial infarction from 8.8 in 2017 to 7.9 in 2019. Most often, patients with myocardial infarction are readmitted after stenting (62.5%).

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