

## PECULIARITIES OF THE COURSE AND PROVISION OF MEDICAL CARE TO PATIENTS WITH ACUTE CORONARY SYNDROME IN THE PRECARPATHIAN REGION

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## ОСОБЛИВОСТІ ПЕРЕБІГУ ТА НАДАННЯ МЕДИЧНОЇ ДОПОМОГИ ХВОРИМ З ГОСТРИМ КОРОНАРНИМ СИНДРОМОМ НА ПРИКАРПАТТІ

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**Abstract.** Cardiovascular diseases are the first ones in mortality among other diseases. Particular attention should be paid to patients after acute coronary syndrome, since their quality of life, the possibility of restoration of work capacity.

**Objective of the research.** To evaluate indicators of medical care provision for patients with acute coronary syndrome in the Precarpathian region.

**Materials and methods.** The medical-geographical indicators, data of the local registry (2014-2018) included clinical and objective parameters, peculiarities of the course, rehabilitation and treatment of patients with acute coronary syndrome.

**Results.** The peculiarities of the course of acute coronary syndrome, clinical characteristics of patients depend on the form of IHD and the applied method of ACS treatment. There is an increase of the number of PCI performance and the reduction of TLT, the percentage of admission of patients up to 2 hours remains low. The increase of PCI performed in the districts of the region in the dynamics from 2014 to 2018 has been determined, as well as the geographical peculiarities of the Ivano-Frankivsk region. The percentage of patients' undergoing rehabilitation after acute coronary syndrome remains low.

**Conclusions.** The Precarpathian region has a number peculiarities that are related to the location of the region. Taking into account the characteristics will contribute to the improvement of the organizational model of medical care provision in the region.

**Keywords:** acute coronary syndrome; Precarpathian Region.

### Problem statement and analysis of recent research

The ischemic heart disease is the most frequent reason of death all over the world. Over seven million people with IHD die every year, that is 12.8% out of all mortal cases [1].

The frequency of cases of hospitalization with myocardial infarction with the ST elevation is various in different countries — the participants of the European Society of Cardiologists. NSTEMI in the long dates has mortality indices similar to STEMI, which causes attention to these patients in the acute phase, and in the period of rehabilitation [2, 3].

For the valuation of the adherence to recommendations and the effectiveness of treatment of patients in different countries the registers are used — special scientific research programmes, in which all patients with pathology being studied, are included [4,5,6]. During the last years such registers are one of the main ways of studying of acute coronary syndrome (ACS) in real practice [7,8].

According to the EUROASPIRE IV study, in Ukraine, the insufficient use of European guidelines for the secondary prevention of coronary heart disease in everyday clinical practice [9].

The quality of medical care provided to patients with ACS involves the organization of a local reperfusion network, the main task of which is to minimize time delays from the moment of referral for medical care for timely and most efficient reperfusion therapy [10].

It is necessary to take into account the territory on which the population lives, with its climatic and geographical features, the possibilities to provide timely and adequate medical care. The peculiarity of the territory of the Ivano-Frankivsk region is the presence of various climatic and geographical zones, the

prevalence of rural population, the remoteness of settlements from medical institutions, and the limitation of the number of centers for providing specialized medical care to patients with acute coronary syndrome (ACS).

**The objective of the study.** To evaluate indicators of medical care provision for patients with acute coronary syndrome in the Precarpathian region.

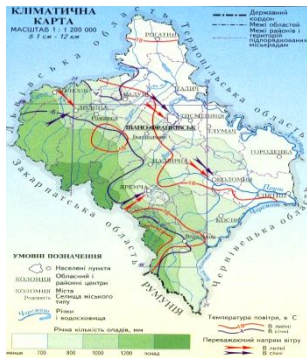
### Material and methods of the study

The medical-geographical indicators, data of the local registry of patients after acute coronary syndrome at the rehabilitation stage in the period from 2014 till 2018 that included clinical and objective parameters, peculiarities of the course, rehabilitation and treatment of patients with acute coronary syndrome, as well as geographic and statistical-demographic data.

### Results and discussion of the study.

The Ivano-Frankivsk region occupies an area of 13.9 thousand km<sup>2</sup>, which is 2.4% of Ukraine's territory. The geographic feature of the region is the division of relief into three zones: plain, foothill, on which the regional center is located — Ivano-Frankivsk (255 m above sea level), mountains (Carpathian Mountains, occupy the southwestern part of the region, here is the highest mountain of Ukraine — Hoverla (2061 m)). The relief elevation rises from northeast to southwest [11].

Population of the region — 1381,5 thousand, including in plain areas — 369.5 thousand, foothill areas — 708.4 thousand, mountainous areas — 304.7 thousand in administrative division includes 14 districts, 5 city councils [12].



The climate of the region is moderately continental, moist, characterized by significant fluctuations in temperature, atmospheric pressure, humidity, wind direction in accordance with the relief zones.

Main part of the region's population lives in villages – 57.1% (788.2 thousand), the part of urban population is 42.9% (593.3 thousand).

The uneven density of the population, which goes down from the plains to mountainous regions is one of the unique peculiarities of the region. An average population density of the region – 101.4 persons/km<sup>2</sup>, the highest density is in plain areas – 115 persons/km<sup>2</sup>, the lowest is in the Verkhovynsky district – 24 persons/km<sup>2</sup>.

The most important medical-social problem due to the increasing of prevalence, morbidity, severe consequences of disability (third part of all causes of disability) and life (more than half of all cases of death) are circulatory system diseases (CSD): atherosclerosis, ischemic heart disease (IHD), arterial hypertension (AH) and their complications (heart attack, stroke), which rank first among other nosologies.

To the structure of total mortality of the population, in which during 2000-2018 growth for diseases of the digestive system (+40.0%), cholesterol (+19.5%), onco- (+4.9%) and decrease in respiratory diseases (-82.0%) was noted (Fig. 1).

At the age of 45-59, the main percentage is men 27 (27.5%), women 4- (4.08%) with NSTEMI and 65 (23.5%) and 9 (3.2%) at STEMI, respectively; in the age group 60-74, the proportion of women with NSTEMI 16 (16.3%) and STEMI 52 (16.84%) versus men is 20 (20.4%) and 16 (16.33%), and at the age above 75 years for NSTEMI women prevail - 16 (16.3%). This trend was observed in previous years and is comparable to the general data of Ukraine. The distribution of patients with NSTEMI by gender and age is represented in Figure 2, STEMI (Figure 3)

Analyzing the clinical characteristics of patients with acute coronary syndrome, it was found that among patients with NSTEMI, which used conservative treatment, 63.3% (38) were residents of the city, 36.7% - residents of the village; respectively, the PCI was performed in 68.0% and 32.0% of patients (Table 1). In a cohort of patients - residents of the city with STEMI 55.6% of patients treated conservatively, in one third of patients (35,1%) – thrombolysis was performed and in almost half of patients (46,2%) – PCI was performed. Accordingly, the villagers accounted for 4.4%, 66.7% and 53.9%, namely, 2/3 of patients who used TLT were residents of the village.

The percentage of patients without increase in blood

pressure was insignificant, and it was in the group of patients with STEMI 9.5%, 10.5% and 10.2%. In most of the patients examined there was an arterial hypertension (AH). Moreover, in spite of the applied medical technology and the course of coronary artery disease, the majority of patients had AH II. In the presence of NSTEMI, the 3<sup>rd</sup> degree of hypertension was observed in 21.7% and 25.3% of patients with conservative treatment and PCI. TLT in the case of STEMI was used in 10.5% of patients without hypertension and in 8.8%, 68.4% and 12.3% of patients with hypertension of the first to third degree, respectively. In all groups, patients were associated with diabetes type II, the frequency of which was – from 16.0% to 31.7% of cases

In the region between 2014 and 2018 there is a decrease in cases of myocardial infarction (Fig. 4). So, the highest level was in 2016 – 1297 cases, in 2018 – 1188 cases. No significant fluctuations in percentages are observed for STEMI and NSTEMI cases. STEMI in 2016 was 962 cases (74.1%), and in 2018 – 815 cases (68.3%). NSTEMI in 2016 – 336 cases (25.9%), and in 2018 – 373 cases (31.7%).

From 2015, there is an increase in the percentage of patients who have been diagnosed with PCI. So, in 2015, 333 patients with ACS were followed by PCI, in 2018 there were 582 interventions. Due to the geographical features and remoteness of some districts from the only one center in the region where primary PCI is performed, in part of patients, thrombolytic therapy (TLT) was used. There were 75 TLT in 2018 against 175 in 2014 (Fig. 5).

Taking into account the geographical features of the region, as well as the insufficient number of centers with the possibility of PCI performing, 343 patients with ACS in 2018 were admitted to the united center of Ivano-Frankivsk region: up to 2 hours – 66 patients – 21%, 2-6 hours – 162 patients – 51%, 7-24 hours of patients – 19 – 6%, more than 24 hours – 19 patients – 6% (Fig. 6).

Analyzing the amount of the performed PCI in the districts of the region, the increase of the number of the intervention was defined from 2014 till 2018 (Fig. 7). However, the features of geographical position and the great distance of the districts from the PCI, centres with the possibility of providing had been marked. So, the smallest number of the patients, who were given PCI, live in Verhovynsky district – 3 (three) and in the town of Bolekhiv – 4 (four). The largest number, given PCI was in 2018 in the city of Ivano-Frankivsk – 187 (one hundred and eighty-seven).

With the purpose of improvement of giving medical aid it is expedient to establish the centres with conducting invasive diagnostic methods, treatment and rehabilitation of the patients in the following towns. In particular, in the city of Ivano-Frankivsk, including Ivano-Frankivsk and the following districts: Halytsky, Tlumatsky, Tysmenetsky, Rohatynsky and the town of Burshtyn;

— in the town of Kalush, including such districts: Kalusky, Rozhniativsky, Dolynsky and the town of Bolekhiv;

— in the town of Kolomyia, including the following districts: Kolomyysky, Horodenkivsky and Sniatynsky;

— in the town of Nadvirna, including such districts: Nadvirniansky, the town of Yaremche and Bohorodchansky district.

Kosivsky centre can be separately allocated. It will unite

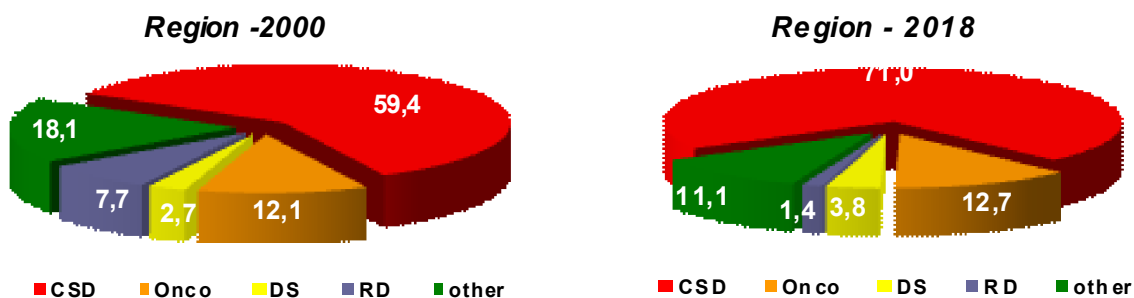


Fig. 1. Health indicators of the Ivano-Frankivsk region during 2000-2018

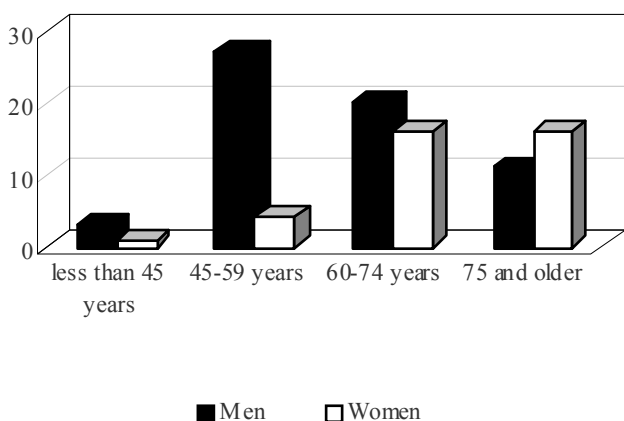


Fig. 2. Distribution of patients with NSTEMI by age and gender

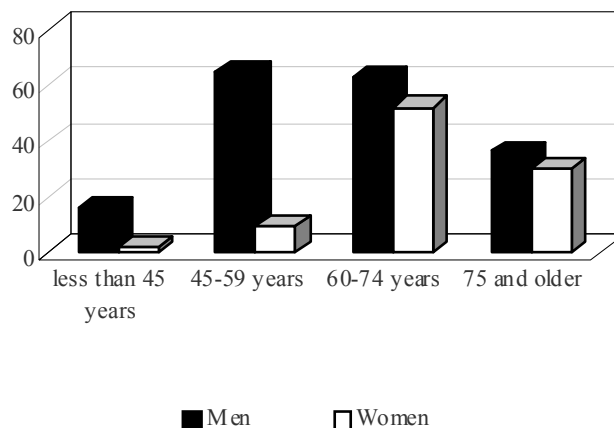


Fig. 3. Distribution of patients with STEMI by age and gender

Table 1. The clinical characteristics of patients with acute coronary syndrome

	NSTEMI (n=135)		STEMI (n=198)		
	Conservative treatment (n=60)	PCI (n=75)	Conservative treatment (n=63)	TILT (n=57)	PCI (n=78)
Residents of the city	38 (63.33%)	51 (68.00%)	35 (55.56%)	20 (35.09%)	36 (46.15%)
Residents of the village	22 (36.67%)	24 (32.00%)	28 (44.44%)	37 (66.67%)	42 (53.85%)
Without AH	9 (15.00%)	5 (6.67%)	6 (9.52%)	6 (10.53%)	8 (10.26%)
AH I	-	3 (4.00%)	-	5 (8.77%)	2 (2.56%)
AH II	38 (63.33%)	48 (64.00%)	43 (68.25%)	39 (68.42%)	43 (55.13%)
AH III	13 (21.67%)	19 (25.30%)	14 (22.22%)	7 (12.28%)	25 (32.05%)
Diabetes type II	19 (31.67%)	12 (16.00%)	11 (17.46%)	10 (17.54%)	15 (19.23%)
Without heart failure			4 (6.35%)	5 (8.77%)	15 (19.23%)
HF I	51 (85.00%)	54 (72.00%)	9 (14.29%)	8 (14.04%)	7 (8.97%)
HF IIA	8 (13.33%)	14 (18.67%)	18 (28.57%)	17 (29.82%)	17 (21.79%)

Notes: 1. The absolute number of patients is indicated. 2. The percentage to the absolute number of studied persons is represented in the brackets

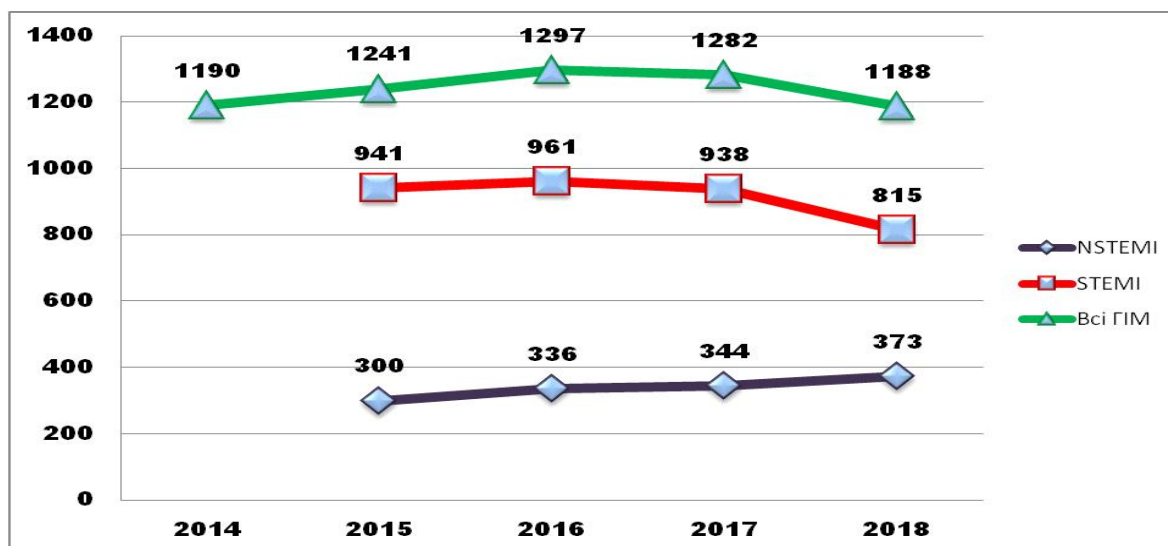


Fig. 4. The number of acute myocardial infarction 2014-2018

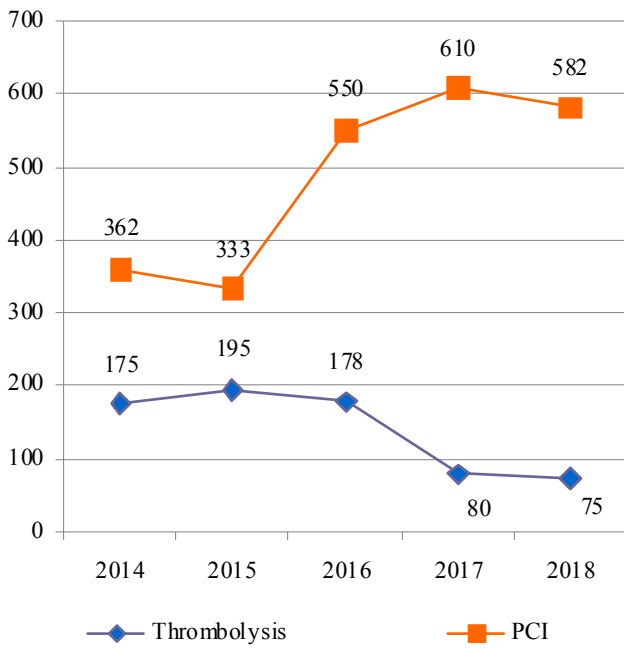


Fig. 5. Dynamics of ACS treatment

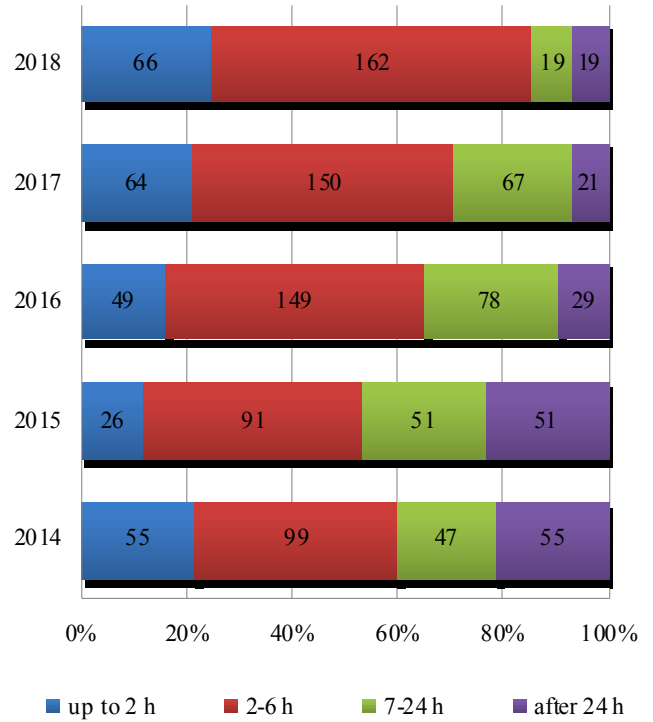


Fig. 6. Structure of patients by time of admission to the center with possibility of PCI

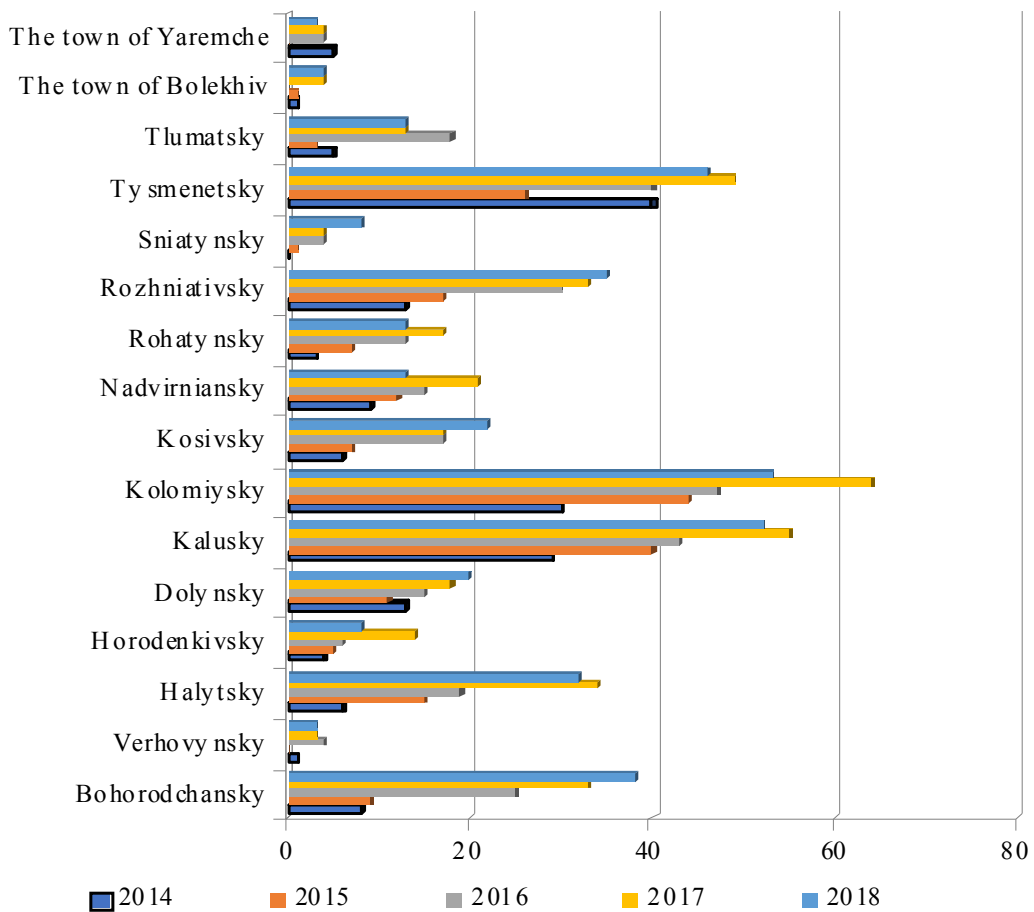


Fig. 7. The amount of PCI from 2014 till 2018 in the district of Ivano-Frankivsk region

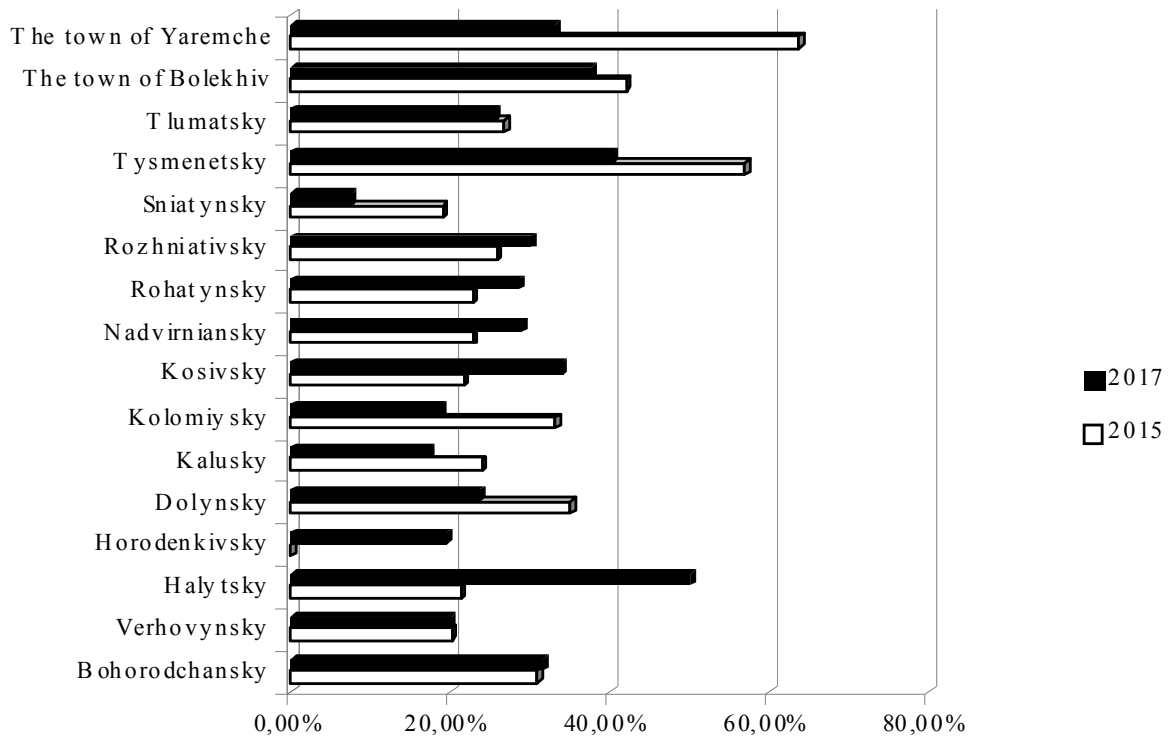


Fig. 8. Rehabilitation after the acute coronary syndrome in the districts



**Besides taking into account the remoteness of the districts from the regional centre or the centre with the possibility to conduct PCI, it's necessary to take into account the most remote villages in each district.**

Kosivsky and Verhovynsky districts.

In particular, in Verhovynsky district – the villages of Holoshyna (54km), Burkut (37km), in Rohatynsky district – the villages Melna (25km), Zhuravensky (33km), Svitanok (37km), in Dolynsky district —the villages of Vyshkiv (43km), Senechiv (47km) and village of Trostianets (32km) in Sniatynsky district.

The rehabilitation and the restoration is the integral part of

supplying the patients with acute coronary syndrome with effective medical care.

On the basis of the Ivano-Frankivsk Regional Clinical Cardiology Center there is a rehabilitation department where patients of working age underwent rehabilitation after acute coronary syndrome and cardiac surgery.

In the region there is a need for a rehabilitation institution, where provision of more effective rehabilitation for the entire population of the region. The percentage of rehabilitation is low, for example in 2017 – 28.1% of patients (Fig. 8).

There is a multidisciplinary approach in the rehabilitation department, which covers all components of rehabilitation. Physical rehabilitation is done (including morning gymnastics, medical physical exercises, closed walking, physiotherapy, procedures, massage) along with medical aid.

The suggestive methods (auto-training, music therapy, individual and group counseling, training are used in psychological rehabilitation. The teaching of the patients is one of the methods used in the department. A school-club "Health Heart" was created. To support patients in the medical and psychological areas; increase of awareness of patients with cardiovascular diseases psychological component of diseases; improve of rehabilitation of patients; increase patients' attachment to non-drug and medical treatment; work on the internal picture of health and the internal picture of the disease; form skills and abilities of influence on behavioural risk factors; train self-control skills; provide the first premedical care; promote healthy lifestyle, increasing the patient's responsibility for maintaining his health and motivating him to recover; work with families and relatives of patients is the purpose of the work. A page of social networks is also created for social awareness.

## Conclusions

1. The cardiovascular diseases take the first place in mortality among other diseases despite the introduction of new diagnostic methods and treatment. The acute coronary syndrome, as the manifestation of ischemic heart disease, leads to disability, reducing the quality and life expectancy of patients. It needs improvement of the methods of treatment, in particular the rehabilitation and restorative treatment of such patients.

2. Taking into account the importance of studying and improvement of the quality of provision of medical care for the patients with the cardiovascular diseases it is relevant to take into account the geographical situation of the districts of Ivano-Frankivsk region.

3. The geographical peculiarities, reducing attention of the population to the health, appeal for medical treatment in critical situations, failure to conduct the preventive or restorative treatment — all this is the peculiarity of the Precarpathian region.

4. The determined regional peculiarities and the remoteness of the districts of Ivano-Frankivsk region from the regional, centre, when PCI and the surgical revascularization are conducted, it is necessary to create the centres with the possibility to conduct the revascularization.

Perspective is the peculiarities of the course and provision of medical care to patients with stable ischemic heart disease in the Precarpathian region.

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