

# Clinical characteristics of patients with myocardial infarction treated in the regional hospital of Radomszczanski District in 2007–2009

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## Abstract

**Background:** Cardiovascular diseases are responsible for about 50% of deaths in Poland. The clinical picture of coronary heart disease has been changing over recent years.

**Aim:** To assess the changes of the clinical characteristics of myocardial infarction (MI) in the population of Radomszczanski District in 2007–2009.

**Methods:** The retrospective analysis included 756 patients aged between 29 and 93 years (306 women), who were hospitalised due to MI in the Department of Cardiology, District Hospital in Radomsko from 1 January 2007 to 31 December 2009. The following parameters were analysed: frequency of ST elevation MI (STEMI) and non ST elevation MI (NSTEMI) hospitalisations in subsequent years, age, gender, traditional risk factors (hypertension, diabetes, obesity, hypercholesterolaemia, hypertriglyceridaemia, smoking), comorbidities (atrial fibrillation, previous stroke and MI, chronic renal insufficiency) and all-cause in-hospital mortality.

**Results:** Observations have shown that during 2007–2009 the number of hospitalised STEMI increased ( $p = 0.011$ ) while the number of hospitalised NSTEMI decreased ( $p = 0.011$ ). The incidence of hypertension, diabetes, obesity, and dyslipidaemia did not change over the three years analysed ( $p > 0.05$ ). In Radomszczanski District, compared to the Polish population, hypertension, obesity and previous MI occurred less frequently, especially in patients with NSTEMI. The incidence of smoking and diabetes was comparable to that in the Polish population with MI. Frequency of risk factors did not change over three years.

**Conclusions:** Despite the increase of the hospitalised STEMI/NSTEMI ratio, the incidence of risk factors did not change in the population of Radomszczanski District over the analysed period.

**Key words:** myocardial infarction, hypertension, cardiovascular risk factors

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## INTRODUCTION

Cardiovascular diseases, especially coronary heart disease and hypertension (HTN) with all their complications, are responsible for about 50% of all deaths in Poland [1]. The development of medical care, dissemination of the latest advances in preventive and interventional cardiology, and the increase of general health awareness in society have resulted in changes in the frequency of risk factors for cardiovascular diseases. This implies also a change in the clinical picture of coronary heart disease, and especially of myocardial infarction (MI).

A significant reduction in the incidence of myocardial infarction with ST-segment elevation MI (STEMI) has been observed in developed countries. An incidence of STEMI of between 44 and 142 per 100,000 inhabitants has been described in a study of 30 European countries. These figures are consistent with the incidence reported in North America [2, 3]. Records such as: Polish — Polish Registry of Acute Coronary Syndromes; international — Global Registry of Acute Coronary Events (GRACE), European — Euro Heart Survey, Swedish — Register of Information and Knowledge about

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Swedish Heart Intensive Care Admission (RISK-HIA), French — French Registry on Acute ST-elevation and non ST-elevation Myocardial Infarction (FAST-MI), and British — British Myocardial Ischaemia National Audit Project (MINAP), make it possible to raise awareness about the incidence of MI and improve the effectiveness of MI treatment [4–7].

The aim of this study was to assess the changes in some clinical aspects of MI in the population of Radomszczanski District in 2007–2009. These findings may be used to improve planning strategies for the prevention and treatment of MI.

## METHODS

A retrospective analysis included 756 patients aged between 29 and 93 years, including 306 women, who in the period from 1 January 2007 to 31 December 2009 were hospitalised in the Department of Cardiology, District Hospital in Radomsko, with a diagnosis of MI. These people lived in Radomszczanski District, which has 117,431 inhabitants (2009). Investigated patients were therefore 0.64% of the population of the District. In this group there were patients diagnosed with acute coronary syndrome (ACS) — non-STEMI (NSTEMI) and STEMI. The study did not include the patients with ACS — in the form of unstable angina due to the heterogeneity of this group of patients. These patients were classified in hospital statistics to both groups — unstable and stable coronary artery disease.

The analysis took into account the following parameters: frequency of STEMI and NSTEMI in subsequent years, age, gender, presence of traditional risk factors (HTN, diabetes mellitus [DM], obesity, hypercholesterolaemia, hypertriglyceridaemia, smoking), presence of comorbidities (atrial fibrillation [AF], previous stroke and MI, chronic renal insufficiency) and all-cause in-hospital mortality. All analysed data was from hospital records.

Myocardial infarction (STEMI and NSTEMI) was diagnosed on the basis of the clinical, electrocardiographic (ECG) and biochemical criteria [8, 9]. STEMI was diagnosed in accordance with the criteria of the Guidelines of the European Society of Cardiology (ESC) for the management of acute MI in patients presenting with ST-segment elevation [8]. NSTEMI was defined in accordance with the criteria of the Guidelines of the ESC for the management of ACS in patients presenting without persistent ST-segment elevation. As a biochemical parameter of myocardial damage, troponin T was used according to recommendations [9]. HTN was defined according to the definition of the Polish Hypertension Society (PTNT) —  $\geq 140/90$  mm Hg [10]. Dyslipidaemia (hypercholesterolaemia/hypertriglyceridaemia) was defined according to the guidelines of the Polish Forum for Prevention of Cardiovascular Disease as a total cholesterol level  $\geq 190$  mg/dL and/or low density lipoprotein cholesterol  $\geq 115$  mg/dL and/or triglycerides  $\geq 150$  mg/dL [11]. Patients on statins before admission who did not meet the criteria of dyslipidaemia were not coded as hypercholesterolaemic/dyslipidaemic. Obesity was defined

on the basis of body mass index  $\geq 30$  kg/m<sup>2</sup>. Type 2 DM was diagnosed in patients already suffering from DM [12]. Active smokers were people who were using actively nicotine before hospitalisation and who declared active smoking during the interview in the hospital. Atrial fibrillation was diagnosed on the basis of an ECG performed during hospitalisation and included permanent, persistent paroxysmal one; previous stroke and MI in history were diagnosed based on the medical documentation provided; and chronic renal insufficiency was diagnosed on the basis of measurements of creatinine  $> 1.5$  mg/dL.

All patients received standard treatment in accordance with ESC guidelines, according to clinical presentation.

## Statistical methods

For calculating the significance of changes in independent variables in consecutive years of observation, the test  $\chi^2$  for trend was used. During the statistical analysis a model of polynomial regression with multi-state dependent variable — years of observation and group of independent variables including occurrence of MI type (STEMI/NSTEMI) was used. Polynomial logistic regression was used because the analysis in the study needed a more general method as variables were not restricted only to two categories. Logistic regression was used to assess the relationship between dependent variables (type of MI — STEMI/NSTEMI) and group of the independent variables.  $P < 0.05$  was used as the definition of statistical significance. All statistical analyses were performed using SPSS 11.5 and STATISTICA.

## RESULTS

Analysis of polynomial regression showed that the incidence of MI, regardless of other variables, seemed to have increased in subsequent years of observation (246 — 2007; 251 — 2008; 259 — 2009) (Tables 1, 2). In the first year of observation, the number of NSTEMI significantly decreased, whereas the number of STEMI increased significantly. In the following year, the number of each type of MI remained at the same level (Table 1, Fig. 1). In subsequent years, the number of patients referred for interventional therapy increased. This trend has concerned both STEMI and NSTEMI patients (Tables 1, 2). In the following years, the frequency of risk factors and comorbidities except for AF did not change. The incidence of AF in the first year of observation increased and it decreased further (Table 1).

Men were more often patients in both STEMI and NSTEMI groups, and especially men predominated in the STEMI group (Tables 3, 4). Patients with NSTEMI were older, more likely to have AF and chronic renal insufficiency. On the other hand, patients with STEMI more frequently smoked cigarettes and more often were male. The distribution of other risk factors in subsequent years remained similar in both groups of STEMI and NSTEMI patients (Tables 3, 4). Logistic regression analysis showed that the incidence of MI was independently

**Table 1.** Group of independent variables in consecutive years of observation

		2007		2008		2009		P
		N	%	N	%	N	%	
MI	STEMI	103	41.9	134	53.4	139	53.6	0.011
	NSTEMI	143	58.1	117	46.6	120	46.3	
Interventional MI treatment	No	15	62.2	144	57.4	118	45.6	0.001
	Yes	93	37.8	107	42.6	141	54.4	
Gender	Woman	105	42.7	105	41.8	96	37.1	0.379
	Man	141	57.3	146	58.2	163	62.9	
Hypertension	No	103	41.9	107	42.6	103	39.8	0.793
	Yes	143	58.1	144	57.4	156	60.2	
Diabetes mellitus	No	194	78.9	189	75.3	202	78.0	0.611
	Yes	52	21.1	62	24.7	57	22.0	
Obesity	No	235	95.5	236	94.0	247	95.4	0.699
	Yes	11	4.5	15	6.0	12	4.6	
Hypercholesterolaemia	No	233	94.7	239	95.2	245	94.6	0.945
	Yes	13	5.3	12	4.8	14	5.4	
Hypertriglyceridaemia	No	239	97.2	235	93.6	248	95.8	0.160
	Yes	7	2.8	16	6.4	11	4.2	
Atrial fibrillation	No	231	93.9	235	93.6	244	94.2	0.011
	Yes	15	6.1	16	6.4	15	5.8	
Stroke in history	No	234	95.1	236	94.0	247	95.4	0.963
	Yes	12	4.9	15	6.0	12	4.6	
Chronic renal insufficiency	No	236	95.9	244	97.2	249	96.1	0.768
	Yes	10	4.1	7	2.8	10	3.9	
Current smoking	No	170	69.1	174	69.3	182	70.3	0.711
	Yes	76	30.9	77	30.7	77	29.7	
MI in history	No	218	88.6	216	86.1	218	84.2	0.955
	Yes	28	11.4	35	13.9	41	15.8	
Death	No	236	95.9	235	93.6	251	96.9	0.347
	Yes	10	4.1	16	6.4	8	3.1	

Data presented by the number and percentage of observations; MI — myocardial infarction; NSTEMI — non-ST segment elevation myocardial infarction; STEMI — ST segment elevation myocardial infarction

associated with age, gender, AF, chronic renal insufficiency, smoking, and type of treatment used, and that its frequency had varied significantly over time (Table 4).

99% of patients participating in our observation had their weight and mass measured. 88% of patients had a lipidogram available in the medical documentation on the day of discharge. All patients had blood pressure measured at least a few times during hospitalisation, but the data about hypertension was taken from medical records on the day of the discharge.

## DISCUSSION

Observations have shown that in Radomszczanski District in 2007–2009, the number of patients hospitalised with MI increased. In 2007–2008, the number of STEMI increased

while the number of NSTEMI dropped. This configuration remained in 2009. According to the registers kept in Sweden (RIKS-HIA) from 1995 to 2008, the number of STEMI decreased from 45% to 27%. In most other observations, a decrease in the incidence of STEMI and an increase of NSTEMI have been observed (Northern California [STEMI: 47% — 1999, 23% — 2008]) [7, 8]. One of the reasons for the increase in the incidence of NSTEMI at the beginning of the 2000s is the change of the definition of a MI, taking into account the use of cardiac troponin [9]. In the present observation, this factor does not play a role in changing the frequency of different types of MI because during the analysed period the method of biochemical identification of myocardial necrosis had not changed.

**Table 2.** Dependence between type of myocardial infarction and subsequent years of observation in polynomial regression model

Year*		OR	-95% CI	+95% CI	P
2008	Age	1.01	0.99	1.03	0.4310
	Interventional MI treatment	1.14	0.73	1.79	0.5736
	Gender	1.02	0.70	1.49	0.8996
	Hypertension	0.88	0.60	1.30	0.5217
	Type 2 diabetes mellitus	1.16	0.71	1.87	0.5552
	Obesity	0.90	0.36	2.27	0.8221
	Hypercholesterolaemia	0.92	0.39	2.21	0.8561
	Hypertriglyceridaemia	2.26	0.84	6.04	0.1047
	Atrial fibrillation	1.16	0.53	2.55	0.7137
	Stroke in history	1.42	0.58	3.47	0.4415
	Chronic renal insufficiency	0.54	0.18	1.63	0.2745
	Current smoking	0.97	0.64	1.45	0.8714
	MI in history	1.19	0.67	2.11	0.5458
	Death	1.53	0.65	3.57	0.3291
	NSTEMI	0.65	0.43	0.96	<b>0.0321</b>
2009	Age	1.00	0.98	1.02	0.8421
	Interventional MI treatment	1.84	1.17	2.87	<b>0.0078</b>
	Gender	1.12	0.77	1.63	0.5548
	Hypertension	0.82	0.55	1.21	0.3157
	Type 2 diabetes mellitus	1.04	0.64	1.69	0.8826
	Obesity	0.72	0.27	1.88	0.4980
	Hypercholesterolaemia	1.08	0.47	2.53	0.8505
	Hypertriglyceridaemia	1.48	0.52	4.21	0.4606
	Atrial fibrillation	1.28	0.58	2.83	0.5428
	Stroke in history	1.15	0.45	2.93	0.7701
	Chronic renal insufficiency	0.97	0.35	2.71	0.9532
	Current smoking	0.85	0.57	1.27	0.4281
	MI in history	1.45	0.83	2.53	0.1917
	Death	0.95	0.36	2.52	0.9133
	NSTEMI	0.76	0.51	1.13	0.1769

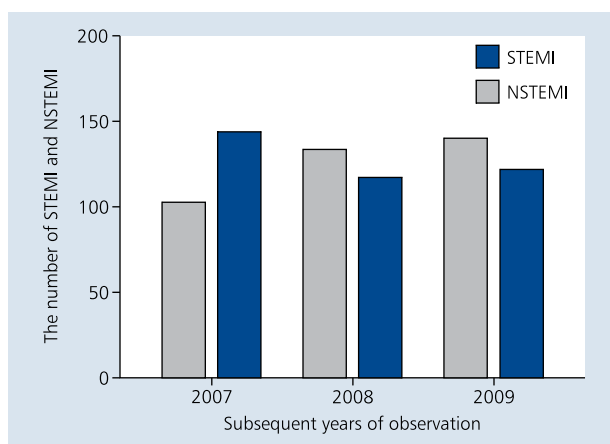
Subsequent years — dependent variable (2007 the reference category), type of MI — independent variable and group of modulating variables. Data presented by odds ratio (OR) with 95% of confidence interval (CI); \*reference category: year 2007; MI — myocardial infarction; NSTEMI — non-ST segment elevation myocardial infarction

Thus, the population of Radomszczanski District presented in recent years completely opposite trends in the incidence of MI than populations in the countries of Western Europe. During the same period in a Swedish population, the number of patients with acute MI decreased (from 11% to 9%) [7]. According to the registers there have been trends of decrease in the incidence of MI in Western European and American populations, whereas the growth is typical for developing countries, and such a population is likely to be the population of the analysed district [13].

The incidence of classic, analysed risk factors (HTN, DM, obesity, dyslipidaemia) did not change over the three

years analysed. This indicates that there was no change in the risk of MI. The trends of the increase in the number of patients hospitalised for MI might therefore be explained by the increased risk of other factors, not included in the analyses. This can include, for example, low levels of high density lipoprotein cholesterol in this population, and a high level of C-reactive protein; these have not been investigated. There is no unequivocal data which explains the trends in MI incidence. It would be worth in the future expanding the analysis of frequency of the unconventional risk factors.

No change in the incidence of MI risk factors with a high rate of occurrence and the simultaneous increase in the



**Figure 1.** The number of ST segment elevation myocardial infarction (STEMI) and non ST segment elevation myocardial infarction (NSTEMI) in subsequent years

incidence of MI should be a fact motivating the local authority to organise health promotion and prevention activities, including education.

The incidence of MI in the female population decreased progressively during the observation (42.7% — 2007 to 37.1% — 2009), but remained higher than in France in the same period (27%) [6]. In the same period, in an American society analysis, the percentage of women with MI increased [14].

The presence of diabetes was similar to the incidence in the French study (21–25% in Radomszczanski District and 21% in France). The number of smokers in the investigated population was at a similar level (29.7–30.9%) as reported in the Swedish study (30%) [7]. Hypertension occurred more frequently in Radomszczanski District (57–60%) than in the Swedish population (39%) and the French one (54%) [6, 7]. Among the co-morbidities, the occurrence of stroke (5%) was recorded at the same level in the tested and French popula-

**Table 3.** Dependence between the occurrence of myocardial infarction type (STEMI vs. NSTEMI) and group of independent variables

		STEMI		NSTEMI		P
		N	%	N	%	
Age [years]		65.3 ± 11.3		69.3 ± 10.8		< 0.001
Interventional MI treatment	No	128	34.0	287	75.5	< 0.001
	Yes	248	66.0	93	24.5	
Gender	Woman	133	35.4	13	45.5	0.004
	Man	243	64.6	27	54.5	
Subsequent years of observation	2007	103	27.4	13	37.6	0.011
	2008	134	35.6	17	30.8	
	2009	139	37.0	10	31.6	
Hypertension	No	165	43.9	18	38.9	0.168
	Yes	211	56.1	22	61.1	
Type 2 diabetes mellitus	No	290	77.1	25	77.6	0.868
	Yes	86	22.9	85	22.4	
Obesity	No	352	93.6	36	96.3	0.089
	Yes	24	6.4	14	3.7	
Hypercholesterolaemia	No	359	95.5	38	94.2	0.431
	Yes	17	4.5	22	5.8	
Hypertriglyceridaemia	No	359	95.5	33	95.5	0.975
	Yes	17	4.5	17	4.5	
Atrial fibrillation	No	369	98.1	31	89.7	< 0.001
	Yes	7	1.9	39	10.3	
Stroke in history	No	359	95.5	38	94.2	0.431
	Yes	17	4.5	22	5.8	
Chronic renal insufficiency	No	368	97.9	31	95.0	0.033
	Yes	8	2.1	19	5.0	
Current smoking	No	245	65.2	21	73.9	0.009
	Yes	131	34.8	99	26.1	
MI in history	No	326	86.7	326	85.8	0.716
	Yes	50	13.3	54	14.2	
Death	No	354	94.1	368	96.8	0.074
	Yes	22	5.9	12	3.2	

Data presented by the number and percentage of observations; MI — myocardial infarction; NSTEMI — non-ST segment elevation myocardial infarction; STEMI — ST segment elevation myocardial infarction

**Table 4.** Dependences between the occurrence of myocardial infarction type (STEMI vs. NSTEMI) and group of the independent variables in logistic regression model

	OR <sup>#</sup>	−95%CI	+95%CI	P
Age (continuous variable)	1.03	1.02	1.05	< 0.001
Interventional MI treatment	0.17	0.12	0.23	< 0.001
Male gender	0.65	0.49	0.88	0.005
Subsequent years of observation — 2007*				0.011
2008	0.63	0.44	0.90	0.010
2009	0.62	0.44	0.88	0.008
Hypertension	0.82	0.61	1.09	0.169
Type 2 diabetes mellitus	0.97	0.69	1.37	0.868
Obesity	0.56	0.29	1.10	0.093
Hypercholesterolaemia	1.30	0.68	2.48	0.432
Hypertriglyceridaemia	0.99	0.50	1.97	0.975
Atrial fibrillation	6.03	2.66	13.66	< 0.001
Stroke in history	1.30	0.68	2.48	0.432
Chronic renal insufficiency	2.42	1.05	5.60	0.039
Current smoking	0.66	0.48	0.90	0.009
MI in history	1.08	0.71	1.63	0.716
Death	0.52	0.26	1.08	0.078

Data presented by odds ratio (OR) with 95% of confidence interval (CI); <sup>#</sup>dependent variable: NSTEMI vs. STEMI; \*reference category: year 2007; MI — myocardial infarction; NSTEMI — non-ST segment elevation myocardial infarction; STEMI — ST segment elevation myocardial infarction

tions. In the Radomszczanski District population, MI was accompanied by chronic renal insufficiency more frequently than in the Swedish registry (3–4% in the analysed population, 1% in Sweden). All in-hospital mortality in the study group did not differ significantly between years, and was about 5%. Many studies have confirmed a steady decline in the number of deaths in MI, and a reduction in the risk of re-occurrence of MI and life-threatening arrhythmias.

In Radomszczanski District, compared to the Polish population with MI (analysis of nationwide registry of ACS), hypertension was observed more rarely in NSTEMI (61% vs. 72%), MI in history appeared less often in NSTEMI (14.2% vs. 28.3%), and there was also less obesity (4.5–6.0% vs. 16–20%). Differences occurred despite using similar definitions of these risk factors. Particularly, the frequency of hypercholesterolaemia was different in both analyses. The incidence of hypercholesterolaemia in Radomszczanski District was surprisingly low (4.8–5.4%). This is because in our analysis hypercholesterolaemia was defined as a total cholesterol level  $\geq 190$  mg/dL and patients treated with lipid-lowering drugs were not included into a group of hypercholesterolaemic patients if they did not meet the assumed criteria. The incidence of other risk factors (HTN, DM, smoking) was comparable to the population of a nationwide registry of ACS [4, 5, 15].

During the studied period, the number of patients with STEMI and NSTEMI transported to centres with haemodynamic laboratories increased significantly (NSTEMI two-fold).

In 2009, the number of patients referred for urgent treatment with coronary angioplasty increased by almost 50%. Comparing each year, it was found that between the first and the last year of observation the number of primary procedures greatly increased — coronaroplasties in STEMI. This was due to changes in recommendations for the treatment of ACS and the opening of new haemodynamic laboratories (two in Czestochowa and four in Lodz). These results are consistent with the trends observed in other European countries [16]. During the period pharmacological reperfusion (thrombolysis) has been practically abandoned, due to the increasing availability of preferred interventional treatment. Such a trend can be observed in all countries of Western Europe.

Patients with NSTEMI were older and sicker — more often suffered from AF and chronic renal insufficiency. In general, older age is associated with the coexistence of multiple organ diseases and diabetes [17]. This latter condition was observed in the population of the Radomszczanski District with the same frequency in both types of MI. The STEMI patient was usually a man, more often an active smoker, and at a relatively young age. Very similar characteristics of the population with NSTEMI and STEMI give out other observations [15].

According to the epidemiological surveys [18, 19], information on risk factors and measurements are usually incomplete in populations of patients with coronary heart disease. In the EUROASPIRE III survey of a European population, the height and weight of patients after recent MI were

available in 44% and 44.3%, respectively [18]. The high percentage of this data in our study results from the fact that height and weight were routinely measured and recorded in documentation on admission to the Cardiology Department in Radomsko Hospital. Information on hypertension and on the measurements of dyslipidaemia in patients with recent MI was available at discharge in 85.5% and 77.6%, respectively in the EUROASPIRE III survey [18]. Data from our study was available in the greater part of the analysed population. Diagnosis towards hypertension was performed in all patients and a lipidogram was available in 88% of individuals [20].

### Limitations of the study

The presented study has some limitations. There is no certainty that all patients with MI in Radomszczanski District were treated in the hospital from which the analysed data comes (although it is the only hospital in the district). But very few patients with MI could have avoided hospitalisation in the only hospital in the region. We had access only to data on mortality in our hospital. This is why only in-hospital mortality was analysed. Only traditional risk factors for MI were analysed without taking into account new risk factors for cardiovascular diseases. Dyslipidaemia was diagnosed only according to the lipid profile because the data on statins usage before hospitalisation was not complete and fully reliable. The time of the analysis was short (three consecutive years), and may not reflect significant changes in the clinical picture of MI.

### CONCLUSIONS

Despite the increase of the hospitalised STEMI or NSTEMI ratio and trends in the increase of number of patients hospitalised with MI, the incidence of risk factors did not change in the population of Radomszczanski District over the analysed period.

**Conflict of interest:** none declared

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# Charakterystyka kliniczna chorych z zawałem serca leczonych w szpitalu powiatowym powiatu radomszczańskiego w latach 2007–2009

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## Streszczenie

**Wstęp:** Schorzenia układu sercowo-naczyniowego są odpowiedzialne za ok. 50% wszystkich zgonów w Polsce. Obraz kliniczny choroby wieńcowej zmienia się w ciągu ostatnich lat.

**Cel:** Celem pracy była ocena zmian w klinicznej charakterystyce zawału serca (MI) w populacji powiatu radomszczańskiego w latach 2007–2009.

**Metody:** Retrospektywną analizą objęto 756 chorych w wieku 29–93 lat (306 kobiet), którzy w okresie od 1 stycznia 2007 do 31 grudnia 2009 r. byli hospitalizowani na Oddziale Kardiologicznym Szpitala Powiatowego w Radomsku, z rozpoznaniem MI. W analizie wzięto pod uwagę: częstość zawału serca z uniesieniem odcinka ST (STEMI) i bez uniesienia odcinka ST (NSTEMI) w kolejnych latach obserwacji, wiek, płeć, klasyczne czynniki ryzyka (nadciśnienie tętnicze, cukrzyca, otyłość, hipercholesterolemia, hipertriglicydemia, palenie tytoniu), choroby towarzyszące (migotanie przedsionków, przebyty udar mózgu, przewlekła niewydolność nerek, przebyty MI) oraz całkowitą śmiertelność wewnątrzszpitalną.

**Wyniki:** W latach 2007–2009 liczba hospitalizowanych pacjentów z STEMI wzrosła ( $p = 0,011$ ), a liczba chorych z NSTEMI zmniejszyła się ( $p = 0,011$ ). Częstość występowania nadciśnienia tętniczego, cukrzycy, otyłości, dyslipidemii nie zmieniła się w ciągu 3 kolejnych analizowanych lat ( $p > 0,05$ ). W powiecie radomszczańskim — w porównaniu z populacją polską — nadciśnienie tętnicze, otyłość i przebyty MI występowały rzadziej, szczególnie wśród pacjentów z NSTEMI. Częstość cukrzycy i palenia tytoniu była porównywalna z częstością dla całej polskiej populacji. Częstość analizowanych czynników ryzyka nie zmieniła się w ciągu 3 kolejnych lat.

**Wnioski:** Jak wynika z przedstawionej analizy, mimo wzrostu stosunku liczby hospitalizowanych osób z STEMI do osób z NSTEMI, częstość czynników ryzyka nie zmieniła się w populacji powiatu radomszczańskiego w analizowanym okresie.

**Słowa kluczowe:** zawał serca, nadciśnienie tętnicze, czynniki ryzyka sercowo-naczyniowego

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