Knowledge of risk factors of myocardial infarction in patients treated in the Interventional Cardiology Unit of the Regional Specialist Hospital in Biała Podlaska

Ślifirczyk A*[1C-E], Michalczuk T.[2,3A-E], Piszcz P.[2B-D], Kowalenko M.[2B-C], Kierczuk E.[4B-D], Zalewski R.[2B-C], Krajewska – Kułak E.[5F]

1. Department of Emergency Medicine, Pope John Paul II State School of Higher Education, Biała Podlaska, Poland
2. Department of Nursing, Pope John Paul II State School of Higher Education, Biała Podlaska, Poland
3. Regional Specialist Hospital, Biała Podlaska, Poland
4. Medical College of Maria Minczewska in Biała Podlaska, Biała Podlaska, Poland
5. Department of Integrated Medical Care, Medical University, Białystok, Poland

A- Conception and study design; **B** - Collection of data; **C** - Data analysis; **D** - Writing the paper; **E**- Review article; **F** - Approval of the final version of the article; **G** - Other (please specify)

ABSTRACT

Purpose: To analyse knowledge of patients in the Interventional Cardiology Department in the field of theory of the disease entity, i.e. myocardial infarction and factors predisposing to its occurrence.

Materials and methods: The study was carried out at the Interventional Cardiology Department of the Regional Specialist Hospital in BiałaPodlaska between 3.11.2017 and 20.12.2017. Sixty respondents were included, 62% women and 38% men. The largest group were patients between 46 and 60 years of age. The work involved an anonymous questionnaire, which contained 28 questions, including two open ones. Patients participated in the study were informed that the study was voluntary and the questionnaire was anonymous.

Results: According to the respondents, the main cause of myocardial infarction is atherosclerosis (43.4%). The respondents indicate that cardiovascular diseases (including myocardial infarction) which are on the third place in Poland, right after cancer and injuries, cause death (63.3%). As the main factor that influences the occurrence of myocardial infarction is overweight and obesity (79.8%). More than half of the respondents assess their knowledge of myocardial infarction on average, while 18.3 % said that they have very good knowledge.

Conclusions: Patients with myocardial infarction have quite a good knowledge about the risk factors for this disease. A large group of respondents tries to counteract the risk factors for myocardial infarction. A small part of the respondents undergoes regular blood tests (blood glucose level, total cholesterol and its fractions, measurement of blood pressure).

Keywords: Myocardial infarction, risk factors, level of knowledge.

DOI: 10.5604/01.3001.0012.1130

***Corresponding author:**
Anna Ślifirczyk, Department of Emergency Medicine, Pope John Paul II State School of Higher Education in Biała Podlaska, ul. Sidorska 102, 21-500 Biała Podlaska, Poland ,
Tel.: +48 83 344 99 84; e-mail: aslifirczyk1@gmail.com

Received: 24. 04.2018
Accepted: 10.06.2018
Progress in Health Sciences
Vol. 8(1) 2018 p 97-105

INTRODUCTION

Myocardial infarction is a necrosis caused by ischemia of cardiac tissues, i.e. inadequately small supply of cardiomyocytes with oxygen and nutrients. Originally, as a result of the coronary artery disease, abnormal contractility of cardiomyocytes occurs, which leads to disintegration. Then,the cardiac muscle tissue is damaged and repaired into scar tissue. Myocardial infarction is usually caused by the rupture of the atherosclerotic plaque in the vessel supplying heart with blood.

Practitioners tried to confirm their diagnosis of ischemic heart disease with autopsy. During this procedure, they looked for changes in coronary arteries and more intensively merged necrotic lesions in the myocardium as a result of ischemic heart disease. Due to this research, myocardial infarction reached the rank of a clinical and pathological diagnosis, although effective therapy was still not known. It was merely seen that by living a hygienic lifestyle it is possible to prevent ischemic heart disease attacks and know how to alleviate suffering [1].

At the beginning of the 20th century, in 1903 during the first experiments by Willem Einthoven with the use of the electrocardiograph, an effective clinical diagnosis was developed [1].

Next observations, during which myocardial infarction was diagnosed by the means of ECG, were performed by H.E.B. Pardee. In 1920, he gave examples of patients with post myocardial infarction confirmed by electrocardiographic recording and who recovered [1].

The first articles in Poland appeared in 1945, these were the publications of Edward Szczeklik concerning issues of myocardial infarction. ZbigniewReliga introduced the method of reperfusion in recent heart attack in 1985, while in 1988 and 1989 Marian Zembala presented his experiences with this method [1].

Over the last several years, there has been an increase in the incidence of non-ST elevation myocardial infarction (NSTEMI) heart attacks (without ST segment elevation) and a comparable decrease in the number of myocardial infarctions with ST elevation myocardial infarction (STEMI). It was estimated that every year in Europe, NSTEMI infarction occurs in 3 out of 1,000 people. In Poland, the incidence of acute myocardial infarction annually constitutes about 100,000 people. An estimated 60% of deaths caused by a heart attack occur in the prehospital period, usually within an hour of the infarction pain. According to Cook and Goldman, mortality caused by acute phase of infarction decreased by about 40% in the last 15 years. This is due to undertaking pre-hospital resuscitation, the so-called Cardiac Intensive Care Units.

There are several different reasons, combining and interacting with each other, for the risk of myocardial infarction. They are divided into factors that are not subject and subject to modification. Risk factors subject to modification should be eliminated or limited in primary and secondary prevention [2,3]. Factors not subject to modification:

- age - men over 45 and women over 55 years of age
- males
- women - the period after menopause
- genetic load - genogram.

Risk factors subject to modification are divided into:

- Primary risk factors - smoking, hypertension, endocrine disorders, hyperfibrinogenamia, diabetes, hyperuricemia.
- Secondary risk factors - overweight, lack of exercise, stress, personality type A (ambitious, aggressive), women taking oral contraceptives, increased concentration of C-reactive protein.

There is also a group of uncharacteristic risk factors, which include hypothyroidism, increased homocysteine and acromegaly.

The presence of two primary risk factors suggest a risk for myocardial infarction by four times, whereas if there are three primary risk factors, the risk is by 10 times higher [4].

There is also a division of risk factors into causal, conditional and predisposing. The causative factors include cigarette smoking, diabetes, hypertension, low HDL cholesterol and increased total cholesterol and/or LDL cholesterol. Whereas, conditional risk factors involve increased triglycerides, lipoproteins, low-density lipoproteins, increased levels of homocysteine and coagulation factors. The group of predisposing factors includes obesity, lack of physical activity, male gender, family history concerning early occurrence of coronary heart disease and psychosocial factors [5].

Acute myocardial infarction is described as long-lasting (over 20 minutes) and sudden ischaemia of a portion of the heart muscle caused by the cessation or significant impediment of blood supply to this region and, as a result, to its necrosis [6].

If the heart attack has a typical course, the subjective symptom is oppression or chest pain and a retrosternal condition, and can also be located within the neck. It is often described as a girdle pain or pain radiating to the left shoulder and mandible, less often to the left shoulder and thoracic spine. Chest pain is also characterized as crushing and choking, but it can also be atypical, dull, burning or acute pain. The above-mentioned

symptoms are accompanied by feelings of exhaustion, weakness, shortness of breath and fainting.

Often the symptoms of a heart attack are nausea and vomiting, which are accompanied by paleness and profuse sweating - they may mistakenly suggest gastrointestinal diseases. Due to the occurrence of the symptoms, a feeling of anxiety and psychomotor anxiety arises in a patient. Then the patient changes the position of the body looking for the one that could compensate for the existing ailments. Symptoms of myocardial infarction can also take the atypical form - palpitations and even cardiac arrest [7,8].

In some cases - about 1/3 of patients, especially in people with diabetes and in the elderly, a recent myocardial infarction can occur without pain, and its diagnosis is accidental on the basis of ECG [9].

The most frequently observed symptoms include sinus tachycardia with premature ventricular contractions, during the auscultation splitting of the second or third heart sound can be detected. During a large heart attack, a drop in blood pressure may occur [10].

Myocardial infarction without ST elevation is a set of symptoms caused by limiting blood flow in the coronary artery. It leads to necrosis of the portion of the myocardium, and thus to the activation of markers of myocardial infarction in blood serum. However, these symptoms are not accompanied by the elevation of ST segment in the ECG [10].

Patients with NSTEMI are an increasing group among acute coronary syndromes. About 60% are patients over 65, and nearly 50% are female. The highest incidence is recorded between 60 and 80 years of age. The majority of patients with myocardial infarction without ST-segment elevation have significant coronary artery stenosis, resulting in reduced oxygen delivery. This situation leads to necrosis of cardiomyocytes. The NSTEMI trigger factor may also be a complete obstruction of the vessel, although the collateral circulation prevents the occurrence of a myocardial infarction or reduces its location to the subendocardium, thus preventing the occurrence of STEMI [11].

The diagnosis of myocardial infarction according to the WHO is based on the fulfilment of two of the following three criteria [12]:

- characteristic changes in the ECG record,
- pain in the chest,
- laboratory test results showing damage to the myocardium.

The diagnosis of myocardial infarction includes interview and physical examination. Laboratory diagnostics of myocardial infarction, on the other hand, involves the determination of the disappearance and growth of symptomatic proteins and enzymes released by the ischemic area of the myocardium. The biochemical diagnosis of myocardial necrosis at the hospital admission of the patient and in the following days allows to assess the progress of ischemia. The most commonly used cardiac enzymes during the diagnosis are creatine kinase (CK), in particular its isoenzyme (CK-MB), lactate dehydrogenase (LDH), aspartate aminotransferase (AST) and cardiac troponin TnT. The CK-MB enzyme, which occurs in the serum 4-8 hours after the muscle damage and stays at a higher level for up to three days, was the most accurate in the diagnosis of myocardial infarction. The early marker is also myoglobin, which appears in the blood 1-4 hours after the damage to the myocardium and lasts up to 24 hours [3,8,12].

Another basic study in the diagnosis of myocardial infarction is a 12-lead ECG test, which allows to assess the leading rhythm, its frequency and the overload of atria and chambers. When suspected of a heart attack, this examination should be carried out as early as possible in order to implement appropriate treatment within 30 minutes. In the diagnosis of myocardial infarction, the first change is usually the elevation of the ST segment, the so-called Parde's wave [5,9].

The gold standard in diagnosing myocardial infarction should be echocardiography. Through ultrasounds, the study shows the morphology, function of the heart and large vessels. This test makes it possible to assess the thickness of the myocardium, contractility disorders, and also to assess the speed of blood flow in the heart and in large vessels [5].

The diagnostic invasive examination of coronary arteries is coronary angiography, the aim of which is to control the lumen of the coronary arteries and, if necessary, to narrow them. Coronary angiography is also helpful in making decisions regarding the choice of revascularization techniques [5,6].

Ischemic changes in the myocardium have a rapid course, so the key condition for the effective treatment of myocardial infarction is the diagnosis and immediate initiation of treatment aimed at rapid restoration of coronary perfusion. Treatment of acute phase of infarction includes two periods: pre-hospital and hospital. An important step is to take action in the prehospital period, because the most deaths are recorded in the first hour of acute myocardial infarction, usually in the course of ventricular fibrillation. Therefore, the earliest beginning of treatment decides about success [13].

One of many forms of therapeutic treatment in myocardial infarction is pharmacological treatment. The following groups of medications are used in this treatment [12]: thrombolytics, anticoagulants, beta blockers, calcium channel blockers, ACE inhibitors, morphine, oxygen, nitroglycerine , acetylsalicylic acid, heparin, lipid-lowering drugs.

Other therapeutic methods include treatment for the restoration of myocardial reperfusion [11].

Myocardial infarction, even after successful reperfusion therapy may pose a risk of complications. This leads to regression of the patient's state of health and a poor prognosis. Complications and consequences of the heart attack [14,15] may be the following:

- Arrhythmias and conduction disorders –they constitute 60-80% of cases of recent myocardial infarction. In the initial period, sinus bradycardia and single or multiple additional spasms may occur. During the infarction, cardiac arrhythmias occur as a consequence of heart hyperactivity and conduction disorders.
- Cardiogenic shock - is associated with about 7-10% of cases of myocardial infarction.
- Acute left-ventricular failure and pulmonary edema - 10-15% of myocardial infarctions.
- Acute mitral regurgitation - is manifested by a loud systolic murmur around the apex of the heart. This is due to the rupture or malfunction of the papillary muscle necrosis. This complication may lead to acute left ventricular failure.
- interventricular septal rupture - it is classified as incidental complication. It is expressed by a pansystolic murmur in the left parasternal area. Symptoms of right-ventricular and left-ventricular failure appear, and central venous pressure increases above the normal limits and painful hepatomegaly occurs.
- Heart rupture accounts for 1-3% of cases. It is manifested by the symptoms of acute cardiac tamponade - enlargement of the heart, shock, lowered heart tones, increased central venous pressure, and in the x-ray picture no pulsation of the heart's edges.
- Post-infarction syndrome - occurs in the course of autoimmune mechanisms accompanying the infarction. It starts between the second and fourth week of the infarction and may recur in the following weeks or months. It occurs in the form of sterile pleurisy, pericarditis, and sometimes inter-stitial pneumonia. The symptoms include an increase in body temperature (38-40^{0}C), high ESR, leukocytosis> 10,000/mm3, heart rate increased during breathing and pericardial and pleural friction. You can also observe ECG changes typical for pericarditis.
- Post myocardial infarction aneurysm constitutes 5-10% of cases. Most often it is a complication of the infarction of the anterior wall of the heart. It develops episodically if the patient has undergone reperfusion therapy. Scarred or destroyed during the course of necrosis, the ventricular wall stretches and protrudes during cardiac contraction.
- Arm/shoulder syndrome - the symptoms of the complications are pain within the arm and shoulder, usually the left one. It manifests itself in a painful restriction of mobility in the elbow and shoulder joints. In addition, there are vasomotor disorders, bone decalcification and skin-muscle dermatoses. The arm-hand syndrome can last for months or even years and then resolves.
- thromboembolic complications - constitute 5-10% of cases and occur as a consequence of detachment of wall thromboses in the right or left ventricle. There are peripheral and pulmonary embolisms.
- Recurrent ischemia or another myocardial infarction – diagnosed based on re-marking of myocardial necrosis markers, re-growth occurs.
- Stroke - complications are due to previous stroke or TIA, coronary artery bypass grafting, old age, small left ventricle ejection fraction, atrial fibrillation and hypertension.
- Sudden death - accounts for 25% of cases. This complication may be caused by the retention of ventricular function, ventricular fibrillation, pulmonary embolism or cerebral embolism, and a ruptured heart.

Prognosis according to Kokot suggest that mortality in myocardial infarction is the highest during pre-hospital period and is 15-20%. 60% of all deaths caused by a heart attack occur in the initial stage of the disease, and mortality during the period of hospitalization is 8-15% [15].

The aim of the work was to analyse knowledge of patients in the Interventional Cardiology Department in the field of theory of the disease entity, i.e. myocardial infarction and factors predisposing to its occurrence.

MATERIALS AND METHODS

The research was carried out at the Interventional Cardiology Department of the Regional Specialist Hospital in Biała Podlaska between 3.11.2017 and 20.12.2017. Sixty patients were included.

They were diagnosed due to heart disease. Women accounted for 67% of respondents, while men 38%.

The largest group were patients between 46 and 60 years of age.

The study involved an anonymous questionnaire, which contains 28 questions, with two open questions.

Patients participating in the study were informed that the participation is voluntary and the questionnaire is anonymous.

RESULTS

The research was carried out on a selected group of patients. They were both men and women. The data indicate that over half of the respondents are women (61.7%). A much smaller proportion were men (38.3%).

The research included people of different ages, the largest group were respondents aged over 60 (55.3%). In the studied group, 37.1% of the respondents were aged from 51 to 60 years of age. The respondents aged 31-50 were a group of 7.6% of the respondents, and in the 18-30 age group there were no respondents.

In the course of further analysis, the place of residence of the respondents was examined. Most of the respondents live in the rural area (58.9%). The second group of respondents live in a town of 50-100 thousand residents (30.7%). However, every sixth respondent lived in the town up to 50,000 residents, and respondents were not registered in cities over 100,000.

The next question included in the survey refers to the education of the respondents. The analysis of the collected data shows that almost half of the respondents have vocational education (40%). Every fourth respondent obtained secondary education, and 21.7% higher. However, every sixth respondent graduated primary school and 3.3% medical school.

The body weight of the examined patients varies from 50 kg to over 100 kg. The data indicate that most people participating in the survey weigh 71-90 kg (42.2%). The second group of respondents was qualified to the range of 50-70 kg (37.6%). However, 16.3% of the subjects weigh from 91 to 100 kg, and 3.9% have a body mass higher than 110 kg.

Table 1. Body weight of respondents

Weight	71-90kg	50-70kg	91-100kg	>110
percent of respondents	42.2%	37.6%	16.3%	3.9%
number of respondents	25	22	10	3

In the research, the height of patients was taken into account, and so almost half of the respondents are between 171 cm and 190 cm tall (49.3%). In contrast, 37.6% of respondents are between 150 cm and 170 cm tall. Much taller people constitute 13.1%, between 191 cm and 200 cm tall. None of the respondents is more than 200 cm tall.

Table 2. Height of patients

Height	171-190cm	150-170cm	191-200cm
percent of respondents	49.3%	37.6%	13.1%
number of respondents	29	23	8

Taking into account the height and weight, the respondents assessed their body weight. Almost half of them believe that they have the correct weight (48.3%). The second group of respondents stated that they were overweight (31.7%), while 15% considered themselves as obese. The analysis of the data also indicated that 5% of respondents think that they are underweight.

Undoubtedly, the health condition is also affected by professional activity. The data says that almost half of the respondents are retired (43.4%). 12.9% are unemployed, and 20.1% are professionally active people. Whereas, the annuitant constitute 23.6%.

At all ages, people should undertake physical exercise. The respondents evaluated their physical activity. Data collected among respondents indicate that more than half of them do not undertake any physical activity, excluding taking up daily activities (58.7%). 21.4% of respondents assessed their physical activity as the average. However, 19.9% of respondents rated their activity as high (see Tables 3).

Table 3. Physical activity

Physical activity	Daily activities	Average activity	High activity
percent of respondents	58,7%	21,4%	19,9%
number of respondents	35	13	12

Cardiovascular disease is a group of diseases that affects a large part of the society. The respondents were asked the question: Do you have cardiovascular disease? The respondents' answers were unambiguous, all of them (100%) declared that they had cardiovascular disease.

In the course of further research, respondents were asked: What cardiovascular diseases do you have? The most common ailments are: heart failure (58.9%), arrhythmias (41.8%) and myocardial infarction (31.4%). Respondents also pointed to such diseases as hypertension (26.9%), atherosclerosis (16.9%), ischemic heart disease (15.7%) and stroke (2.8%).

Cardiovascular diseases occur not only in the respondents, but also in their families. The data indicate that 96.7% of respondents recognized that members of their families had cardiovascular diseases. Another opinion had only 3.3% of respondents. Next, the answers to another question were presented: Which cardiovascular diseases occur in your family? The data indicate that the families of the examined patients most often suffer from diseases related to circulatory insufficiency (60.2%). Quite often, there are also: myocardial infarction (35.4%) and hypertension (34.8%). The respondents also indicated cardiac arrhythmia (23.6%), atherosclerosis (19.7%), ischemic heart disease (11.3%) and stroke (6.8%).

Myocardial infarction is a disease that affects an increasing number of people. It takes place due to the existence of specific causes. To thoroughly investigate the causes of myocardial infarction, the respondents were asked the question: What do you think are the main causes of myocardial infarction? According to the respondents, the main cause of myocardial infarction is atherosclerosis (43.4%). Quite often, the respondents pointed to deep vein thrombosis (33.3%). Every tenth respondent recognized that the main cause is left ventricular failure, and 13.3% have no information on this topic.

Diseases of the circulatory system contribute to the death of many people. In order to examine the knowledge of the respondents on this subject, they were asked the question: Which place, in terms of mortality, occupy cardiovascular diseases (including myocardial infarction) in Poland? The data indicate that, according to the respondents, cardiovascular diseases (including myocardial infarction) which are on the third place in Poland, just after cancer and injuries, contribute to death (63.3%). On the other hand, 16.7% decided that they took second place, and 15% that they were the first. 5% of respondents could not answer this question.

There are many factors that affect the occurrence of myocardial infarction. Some of them affect to the smaller extent, some to a greater one. The respondents share the similar view. The main factor that affects the occurrence of myocardial infarction is overweight and obesity (79.8%). An important aspect is also high blood cholesterol (68.8%), smoking (67.9%), oral hormonal contraception (66.4%) and moderate physical activity (55.7%). To a lesser extent, genetic predisposition (32.6%), underweight (11.5%) and male (4.7%) and female gender (3.5%) have a lower impact.

Each individual should have knowledge about various diseases, including the causes, prevention, diagnosis and treatment of myocardial infarction. Research indicates that more than half of the respondents assess their knowledge of myocardial infarction as average. On the other hand, 18.3% stated that they have very good knowledge, and 15% assess their level as low.

Currently, knowledge about various diseases, including myocardial infarction, can be obtained from various sources. Respondents get the most information about the topic from a nurse (68.4%). To a lesser extent, from a doctor (47.9%) and from magazines (34.7%). The respondents also get news from the television (23.8%), internet (19.9%) and radio (12.5%).

Cigarette smoking contributes to the occurrence of many diseases. However, the public still prefers smoking cigarettes. In the course of further research, respondents were asked the question: Do you smoke cigarettes? The respondents' answers indicate that 26.7% used to smoke cigarettes, but now they do not smoke anymore. However, 23.3% smoke a packet a day, and 21.6% do not smoke cigarettes at all. Every tenth respondent smokes more than two packets a day.

Respondents were also asked the question: How does smoking affect the risk of cardiovascular disease? The research shows that more than half of the respondents stated that cigarette smoking contributes to a two-fold (29.4%) and five-fold (38.3%) increase in the risk of cardiovascular disease. In contrast, 29.7% stated that smoking up to 20 cigarettes a day does not increase the risk of cardiovascular disease, and 2.6% think that smoking does not increase the risk of developing cardiovascular disease.

Living a healthy lifestyle affects the well-being and health of people. The respondents were asked the question: Do you eat healthily? The data indicate that more than half of the respondents do not prefer a healthy lifestyle (63.3%). The opposite opinion have 36.7% of respondents.

A healthy lifestyle determines several aspects, such as eating more vegetables and fruits, regular meals, reducing red meat or white bread consumption. Respondents say that they, in particular, follow such principles of a healthy lifestyle as drinking big amounts of still mineral water (34.7%), avoiding food in the evening and night (31.6%) avoiding red meat (28, 8%),pasta dishes (26.4%) or fatty foods (24.8%). To a lesser extent, the respondents limit salt and sugar (17.9%), eating big amounts of vegetables and fruits (14.9%), regular meals (11.8%) and eating in a

hurry (8.9%) and avoiding excessive intake of coffee (3.2%).

Health control is one of the basic principles of a healthy lifestyle. Respondents were asked: How often do you measure your blood pressure? The answers indicate that 51.2% of them occasionally, e.g., during doctor's visits. However, 28% do not do it at all, and 14% only once a month. A few of the respondents measure blood pressure only once a week (5.6%) and daily (1.4%).

Both younger and older people should do regular blood tests to determine their cholesterol levels. In order to examine the frequency of tests precisely, the respondents were asked the question: Do you do regular blood tests to determine the level of total cholesterol? The research shows that more than half of the respondents do not do regular blood tests for the determination of cholesterol (56.6%). On the other hand, 21.7% do regular tests, but the coefficient does not exceed 175 mg / dl. In the course of further research, it was found that 11.7% also do tests, but their result varies between 176-250 mg / dl, and in every tenth respondent this level exceeds 250 mg / dl.

In the course of further research, the respondents were asked: What is your reaction to stress? The data indicate that the subjects have different reactions to stress. 28.4% of respondents burst with anger, then calm down quickly and 26.7% think that stress causes paralysis and excessive reactions in them. In contrast, 23.3% of respondents experience stressful situations for a long time, and 21.6% try not to worry about stress.
In the course of further research, knowledge of the respondents on the correct blood pressure values was verified. 69.3% considered that normal blood pressure values are120-80 mmHg, according to 6.4% it is 140/90 mmHg. In contrast, 21.5% of respondents stated that they do not know the correct blood pressure.

Respondents were also asked the question: What is the correct value of fasting blood glucose level? According to 48.6% of the respondents, the correct value of fasting blood glucose level is below 100 mg/dl. The second group concluded that this value is below 110 mg/dl (39.2%), and the third that below 140 mg/dl (3.4%). In contrast, 8.8% of the respondents stated that they do not know the correct level of fasting blood glucose level.

Respondents also commented on the correct value of total cholesterol in patients with cardiovascular disease. According to 25.3% of respondents, the normal value of total cholesterol in people with cardiovascular disease is below 150 mg /dl, and 45% stated that this factor is below 190 mg /dl. However, 12.3% believes that the correct value is below 175 mg/dl, and 17.4% of respondents state that they do not know the correct value.

The respondents also assessed their health condition. According to 38.7% of the respondents, their health conditionis good. On the other hand, 28.3% felt that their condition was bad. 18.3% declare that they have very poor health, and 15.7% that it is very good.

DISCUSSION

The results of the conducted research indicate that knowledge of risk factors of myocardial infarction among respondents oscillates at the average level. Almost 67% of the respondents rate their knowledge as average, only 18.3% think that their knowledge is good.

Siwek and Kogut, conducting research on the level of patients' knowledge of risk factors of heart diseases and their lifestyle, analysed the respondents aged 35 to 66. Men accounted for 52% of respondents, and women 48%. A significant part of the respondents, 88% consider smoking as harmful, while 44% admitted smoking before the admission to hospital. The study showed that 42% of respondents assessed their diet as unhealthy. Regarding stressful situations, 48% of respondents could not cope with stress, while 78% said they were easily irritated. As it results from the research, only 26% of the respondents did regular check-ups once a month, of whom 56% measured their blood pressure [16].

Rząca and Charzyńska noted in similar studies that among the respondents, 52.7% thought that the genetic factor predisposes to the occurrence of heart disease [17].
In the publication of Sawicka and co-authors "Awareness of risk factors for ischemic heart disease in people after myocardial infarction", it can be noticed that 59.09% of respondents have a low level of awareness of factors determining the occurrence of ischemic heart disease. Only 15% admitted that they were physically active [4].

Studies carried out by Dziedzic and co-authors show that patients living in rural areas have a lower state of knowledge about heart diseases than patients living in cities. 21% of people living in small towns participated in the research, 67% lived in big cities and 12% lived in the country [18].
The survey carried out by Kozinski and co-authors included answers to the most common risk factors mentioned by the respondents. The most frequent answers were: obesity, poor diet, lack of physical activity and smoking [5].

The results presented in the authors' own study have been developed based on a range of similar questions. However, the age range of the respondents was between 31 and 60. The majority of respondents were women, while men constituted less than 39%. Over half of them were pensioners and retirees. A significant part of them inhabited rural areas, only about 42% lived in the city. Respondents who have higher education belong to a

small group of respondents, because they constitute only 21.7% of all respondents.

The respondents considered atherosclerosis to be the main cause of myocardial infarction and the majority of them placed myocardial infarction on the third place, just after cancer and trauma. They considered overweight and obesity as the main risk factor for myocardial infarction. In addition, respondents were asked to assess the level of knowledge regarding the above disease, mostly assessing the state of their knowledge as average.

However, as the main source of knowledge about myocardial infarction, they indicated information provided by nurses.

Half of the respondents are able to cope well with stressful situations, whereas the other group experiences stressful situations for a long time, and in some of them they cause excessive reactions and paralysis.

Data on cigarette smoking are slightly different, as in the course of our own research, the difference between the respondent groups was almost 8%, where the majority of smokers were patients tested by means of the authors' own research. Most of the respondents believe that smoking cigarettes raises the risk of developing cardiovascular diseases by five times.

The results of the research also indicate that patients have an unhealthy diet, but everyone tries in their own way to implement good habits such as drinking a big amount of still water or avoiding food at night and evening and eliminate products that they consider unhealthy. The body weight of respondents varies from 50 to 100 kg, only 3.9% of respondents rated their weight over 100 kg. However, their height oscillated between 150-200 cm. Patients over 190 cm tall were a small group. Patients assessed their body weight - almost half of them stated that they had adequate weight. The above factors are influenced by physical activity, more than half of the respondents assessed their activity as "little", meaning they performed only daily activities.

The survey shows that the majority of patients do not do regular blood tests, and more than half of the subjects occasionally measure their blood pressure or do not do this at all. The research shows that only 69.3% of respondents know the correct values of blood pressure and 48.6% correct fasting blood glucose level values. Only 12.3% of the respondents know that the total cholesterol level in people with cardiovascular disease should not exceed 175 mg dl. The surveys show that all patients have cardiovascular diseases, and in the family history also these types of diseases have occurred. Most of them suffer from cardiac arrhythmias, cardiac insufficiency, hypertension and post-myocardial infarction. However, summing up the survey, the majority of the respondents assessed their health condition as good and very good.

CONCLUSIONS

1. Patients with myocardial infarction have a relatively good knowledge about the risk factors affecting this disease.
2. The lifestyle of the respondents is not healthy; however, a large group of them tries to prevent the risk factors for myocardial infarction.
3. A small part of the respondents does regular blood tests for the determination of glucose and total cholesterol and its fractions as well as measurements of blood pressure.
4. Genetic predisposition affects the occurrence of myocardial infarction.
5. Respondents do not know the correct values of total cholesterol, blood glucose level, and blood pressure.
6. Respondents are not able to cope well with stress and are quickly irritated, mostly do not know that it affects their health.

Conflicts of interests

No conflicts of interest were declared.

REFERENCES

1. Skalski JH. Zawał serca i dusznica bolesna w dziejach polskiej medycyny, Historia interny polskiej, część II. Rozpoznanie i początki leczenia- wiek XIX i XX. Pol Arch Med Wewn 2008;118(4):248-54. (Polish)
2. Bender H.U, Irwin R, Zawał serca profilaktyka i właściwa kuracja. Wyd. Rea, Warszawa 2004. (Polish)
3. Kaszuba D, Nowicka A. Pielęgniarstwo Kardiologiczne. Wyd. PZWL, Warszawa 2011 (Polish)
4. Sawicka K, Grządka A, Łuczyk R, Wawryniuk A, Prasal M, Łuczyk M, Daniluk J. Świadomość czynników ryzyka choroby niedokrwiennej serca u osób po zawale mięśnia sercowego. Health Sport 2016;6(12):795-816. (Polish)
5. Koziński Ł, Krzymińska – Stasiuk F, Głogowska A, Raczak G. Analiza pomiaru wiedzy o podstawowych czynnikach ryzyka chorób układu sercowo – naczyniowego z uwzględnieniem zależności społeczno-demograficznych - badanie ankietowe. Folia Cardiol Excerp 2012;7(3):170–76. (Polish)
6. Mandecki T. Kardiologia. Wyd. PZWL, Warszawa 2000. (Polish)
7. Janion M, Kardiologia. Kielce, Wyd. Stachurski, Kielce 2005. (Polish)

8. Mandecki T. Złota Seria Interny Polskiej. Kardiologia. Wyd. PZWL Warszawa 2005. (Polish)
9. Opolski G. Kardiologia. Wyd. Urban & Partner, Wrocław 2006. (Polish)
10. Tafil- Klawe M. Wykłady z fizjologii człowieka. Wyd. PZWL, Warszawa 2009. (Polish)
11. Ponikowski P, Fuglewicz A. EKG w stanach nagłych. Wyd. Urban & Partner Wrocław 2010. (Polish)
12. Dembińska-Kieć A, Naskalski J.W. Diagnostyka laboratoryjna z elementami biochemii klinicznej. Podręcznik dla studentów medycyny. Wydanie III, Wyd. Urban & Partner, Wrocław 2013. (Polish)
13. Dzik M, Klamut H, Krupienicz A, Propozycja standardów postępowania z pacjentem przyjmowanym do koronarografii i angioplastyki wieńcowej. Pieleg XXI w 2012;38(1):47-50. (Polish)
14. Gajewski P, Szczeklik A. Choroby wewnętrzne na podstawie Interny Szczeklika, Wyd. Medycyna Praktyczna, Kraków 2013 (Polish)
15. Kokot F, Choroby wewnętrzne tom I. Wyd. PZWL, Warszawa 2001. (Polish)
16. Siwek M, Kogut P. Ocena poziomu wiedzy pacjentów na temat czynników ryzyka chorób serca oraz stylu ich życia w aspekcie przebytego ostrego zespołu wieńcowego. Annales UMCS 2005;40(supl. 16):215. (Polish)
17. Rząca M, Charzyńska – Gula M, Stanisławek A. Świadomość zagrożenia chorobą niedokrwienną serca u osób z grup ryzyka a zachowania zdrowotne. Probl Pielęg 2011;3(3):348-52. (Polish)
18. Dziedzic B, Sienkiewicz Z, Zając P, Wiśniewski A, Wiedza pacjentów na temat czynników ryzyka choroby niedokrwiennej serca leczonych w specjalistycznej poradni kardiologicznej. Piel Zdr Publ 2015;5(1):11-9. (Polish)