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KINESIOPHOBIA DETERMINANTS IN PATIENTS AFTER MYOCARDIAL INFARCTION

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Abstract

Introduction: In the most cases, the causes of morbidity in cardiovascular diseases is lack of regular physical activity. Kinesiophobia, defined as fear before movement may significantly contribute to the occurence and intensification of hypokinesis.

Aim of the study: Determine the level of barriers of a physical activity (kinesiophobia) in patients after Myocardial Infarction (MI). Decided also examine that selected variables: age, BMI, elapsed time since MI and health self-assessment have impact to the general level of kinesiophobia (KCS) and domains: biological (BD) and psychological (PD).

Materials and methods: 64 patients, in age of 47-84 years, after MI: 32 females (age: mean 64.0 ± 9.9 years; BMI: mean 27.1 ± 4,3; Time since MI: mean 10.6 ± 8.5 months) and 32 males (age: mean 67.1 ± 9.7 years; BMI: mean 27.1 ± 3.18; Time since MI: mean 8.7 ± 6.9 months) – patients undergoing cardiology treatment – were examined. Kinesiophobia Causes Scale (KCS), SF-36 (Short Form Health Survey) and author metrics were used.

Results: Patients presented elevated level of kinesiophobia, in general (females: x = 48.7 ± 15.1; males: x = 46.2 ± 10.6) as well as in biological domain (females: x = 42.6 ± 15.9;

males: 40.5 ± 10.9) and psychological domains (females: 54.8 ± 16.3; mężczyźni: 51.8 ± 14.9). In women, BMI index correlated with: BD (r=0.541), PD (r=0.560) and KCS (r=0.566) and were also noted correlations between time since MI and: DB: r=0.408; PD: r=0.591 and KCS: r=0.524). Besides, health factor: physical functioning correlates with: BD: r= – 0,528; DP: r= -0.619 and KCS: r=-0.661. In men, only KCS correlated with pain factor r=-0.407.

Conclusions: In females, BMI and time since MI strongly determine the level of kinesiophobia. In men, disposition seems to be constans. Higher intensification of kinesiophobia in psychological domain suggest take into account psychological sphere in cardiac rehabilitation process. Identification and early diagnosis of the causes of motor passivity is very important, both in primary and secondary prevention.

Key words: kinesiophobia, fear of movement, barriers of physical activity, cardiac rehabilitation

DETERMINANTY KINEZJOFOBII U PACJENTÓW PO PRZEBYTYM ZAWALE MIĘŚNIA SERCOWEGO

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STRESZCZENIE

Wstęp: Podłożem zachorowalności na choroby układu sercowo-naczyniowego w większości przypadków jest brak aktywności fizycznej. Kinezjofobia, definiowana jako lęk przed aktywnością ruchową, może w znacznym stopniu przyczyniać się do występowania i nasilenia zjawiska hipokinezji. Określenie przyczyn pasywności ruchowej wydaję się być niezbędne i konieczne.

Cel pracy: Celem pracy było określenie poziomu barier aktywności fizycznej (kinezjofobii) u pacjentów po przebytym zawale mięśnia sercowego. Postanowiono również zbadać czy wybrane determinanty: wiek, BMI, czas od zawału serca oraz samoocena zdrowia mają wpływ na ogólny poziom kinezjofobii (KCS) oraz jej domeny: biologiczną (DB) i psychologiczną (PD).

Materiał i metody: Zbadano 64 osoby w wieku 47-84 lat: 32 kobiety (średni wiek:

64.0 ± 9.9 lat; BMI: średnia 27.1 ± 4,3) i 32 mężczyzn (średni wiek: 67.1 ± 9.7 lat; BMI: średnia =27.1 ± 3.1). – pacjentów poddanych leczeniu kardiologicznemu w Górnośląskim Ośrodku Kardiologii w Katowicach. Średni czas od zawału u kobiet: 10.6 ± 8.5 miesięcy. U mężczyzn: 8.7 ± 6.9 miesięcy. W badaniu wykorzystano techniki socjometryczne. Poziom kinezjofobii określono za pomocą polskiej wersji kwestionariusza Kinesiophobia Causes Scale (KCS), natomiast samoocenę zdrowia oszacowano za pomocą kwestionariusza SF-36 (*Short Form Health Survey).* Kwestionariusze uzupełniono o autorską metryczkę zawierającą dane dotyczące: płci, wieku, wysokości i ciężaru ciała oraz czasu, który upłynął od zawału serca.

Wyniki: Badani prezentowali podwyższony poziom kinezjofobii, zarówno w ujęciu ogólnym (kobiety: M = 48.7 ± 15.1; mężczyźni: M = 46.2 ± 10.6) jak również w domenie biologicznej (kobiety: M = 42.6 ± 15.9; mężczyźni: M = 40.5 ± 10.9) i domenie psychologicznej (kobiety: M= 54.8 ± 16.3; mężczyźni: M = 51.8 ± 14.9). Różnice istotne statystycznie dotyczyły czynnika: samoocena uzdolnień ruchowych (p=0.0406). Obliczone wskaźniki korelacji Pearsona wykazały u kobiet silną, dodatnią korelację pomiędzy wskaźnikiem BMI a domeną biologiczną (r=0.541), psychologiczną (r=0.560) oraz ogólnym wskaźnikiem kinezjofobii (r=0.566). Odnotowano również silną, dodatnią korelację pomiędzy czasem od zawału a kinezjofobią (odpowiednio: DB: r=0.408; PD: r=0.591 oraz KCS: r=0.524). W każdym z przypadków $p \leq 0.05$. U mężczyzn nie odnotowano korelacji pomiędzy powyższymi zmiennymi. W analizie zależności pomiędzy samooceną stanu zdrowia a kinezjofobią, odnotowano u kobiet korelacje istotne statystycznie tylko dla czynnika zdrowia: funkcjonowanie fizyczne i wynosiły: BD: r= – 0.528; DP: r= -0.619 i KCS: r=-0.661. W przypadku mężczyzn jedynie wskaźnik KCS korelował z czynnikiem: ból r=-0.407. Wszystko $p \leq 0.05$. Wiek nie wpływał na poziom kinezjofobii, ani u kobiet, ani u mężczyzn.

Wnioski: W grupie kobiet BMI oraz czas od zawału silnie determinują poziom kinezjofobii. U mężczyzn ta dyspozycja osobowościowa wydaje się być stała, co tłumaczy brak korelacji. Większe nasilenie kinezjofobii w domenie psychologicznej – w porównaniu z domeną biologiczną, sugeruje uwzględnienie sfery psychologicznej w procesie rehabilitacji. Wysoki poziom kinezjofobii może negatywnie wpływać na proces rehabilitacji kardiologicznej prowadząc do zmniejszenie jego efektywności a w konsekwencji do wydłużenia czasu potrzebnego do osiągnięcia założonych celów terapeutycznych. Może on również stanowić ważny czynnik predysponujący do występowania ponownych incydentów

sercowych. Identyfikacja i wczesne rozpoznanie przyczyn pasywności ruchowej mogą mieć duże znaczenie, zarówno w prewencji pierwotnej, jak i wtórnej chorób układu krążenia.

Słowa kluczowe: kinezjofobia, lęk przed aktywnością ruchową, bariery aktywności fizycznej, rehabilitacja kardiologiczna

INTRODUCTION

Cardiovascular diseases constitute social and economic problem and they are the leading cause of deaths worldwide. Data from the World Health Organization (WHO) in 2011 say about an estimated 17.3 million people died from CVDs, representing 30% of all global deaths [1]. In Europe, due to cardiovascular disease dies over 4.3 million people each year, what represents nearly half of all deaths [2]. This problem also concerns Poland, where premature mortality from heart and vascular disease before 65 years of age is one of the highest in Europe [3]. The main role among of cardiovascular disease plays ischemic heart disease, which includes Myocardial Infarction (MI) [4]. Data from Polish Cardiac Society show that from Heart Attack die more than 100 people every day [5] and the number of hospitalizations due to Acute Coronary Syndromes in 2008 concerned more than 220 thousand people [6]. Although the morbidity of cardiovascular diseases relatively decreased in recent years, estimated that they will still be the most serious health problem in XXI century and the number of people who die from CVDs will increase to reach 23.3. million by 2030 [7].

Primary and secondary prevention of cardiovascular diseases, includes reduce or eliminate risk factors, among them on the leading position is insufficient level of physical activity [8]. Epidemiological studies performed in many countries have provided persuasive evidences about the importance of regular physical activity in the prevention of cardiovascular diseases and reductions of premature mortality [9,10,11,12]. Estimated that regular physical activity can reduce the risk of premature death because of cardiovascular disease by more than 50% (especially risk of dying because of Myocardial Infarction) [13]. However, the problem is sedentary lifestyle associated with insufficient level of physical activity (hypokinesia). Study carried out on the WOBASZ project (a multicentre nationwide study of the Polish population's health), show that 50-60% of Polish adults characterized by too low physical activity [14]. The problem of motor passivity is complex. At the base of hypokinetic attitudes, are located both biological as well as psycho-social factors. These

factors make up the concept of kinesiophobia - fear of movement [15]. Determine the level of barriers of physical activity can be a starting point not only in the context of prevention and reducing risk of acute coronary syndromes, but also in the subsequent treatment and rehabilitation, where physical exercises are indispensable element of cardiac rehabilitation. It was theme to take research presented here.

AIM OF THE STUDY

Determine the level of barriers of a physical activity (kinesiophobia) in patients after Myocardial Infarction (MI). Decided also examine that selected variables: age, BMI, elapsed time since MI and health self-assessment have impact to the general level of kinesiophobia (KCS) and domains: biological (BD) and psychological (PD).

MATERIALS AND METHODS

64 people were examined, in age of 47-84 years: 32 females (age: mean 64.0 ± 9.9 years; BMI: mean 27.1 ± 4,3) and 32 males (age: mean 67.1 ± 9.7 years; BMI: mean =27.1 ± 3.1). Selection of patients to research was purposely. They were patients after Myocardial Infarction (MI) undergoing cardiology treatment at Upper-Silesian Cardiology Center in Katowice, Poland. Time since MI in women: 10.6 ± 8.5 months. In men: 8.7 ± 6.9 months.
In this study sociometric techniques were used – polish versions of questionnaires: Kinesiophobia Causes Scale (KCS) [15,16] and the quality of life questionnaire SF-36 (Short Form Health Survey) [17]. Questionnaires were supplemented about author metrics, which contained data about: gender, age, height, body mass and time of Myocardial Infarction.

KCS is used to diagnose original causes of motor passivity. Construction of scale allows to identification individual causes of kinesiophobia in two domains separately: biological (BD) and psychological (PD), as well as to calculate the total score of kinesiophobia (KCS), which is average value of two domains. Questionnaire consist of 20 closed questions, assessed in range from 0 to 100 and can be interpreted as per cent of results. As a results, 100 means highly kinesiophobic attitude (fear of movement) and 0 - lack of any kinesiophobia symptoms [15,16].

SF-36 questionnaire is tool used to measure self-assessment of health, or more precisely - health-related with quality of life. Questionnaire allows to subjective assessment of eight quality of life indicators: physical functioning, role limitations due to physical health,

pain, general health, emotional well-being, energy / fatigue, role limitations due to emotional problems, social functioning. Answers to the questions are scored into a 0-100 scale. Higher score - higher self-assessment of health. The average value of sum of the first four factors consist to physical component of health (PC), mean value of the other four - mental component of health (MC) [17].

Statistical analysis included performed of descriptive statistics: means and standard deviations. Then examined the level of differences between variables by analysis of variance (ANOVA) and calculated Pearson's correlation coefficient. The adopted level of statistical significance: $p \leq 0.05$. The statistical analysis was performed by STATISTICA package in version 10.0.

RESULTS

First performed descriptive statistics (means and standard deviations) of the kinesiophobia level by gender. The results are shown in Table 1.

Table 1. KCS: Kinesiophobia – descriptive statistics and the level of gender dimorphism

Domains and causes of kinesiophobia	Mean ± SD		p
	female	male	
morphologic	30.1 ± 29.1	26.6 ± 23.1	0.5939
individual need for stimulation	49.5 ± 18.7	48.4 ± 14.7	0.8052
energetic resources	49.9 ± 25.6	43.2 ± 19.8	0.2507
power of biological drives	41.0 ± 16.9	43.7 ± 24.8	0.6079
Biological Domain	42.6 ± 15.9	40.5 ± 10.9	0.5362
self-acceptance	43.6 ± 24.1	38.9 ± 19.9	0.3997
self-assessment of motor predispositions	59.4 ± 19.8	48.1 ± 23.4	**0.0406***
state of mind	50.8 ± 28.0	53.1 ± 20.8	0.7055
susceptibility to social influence	65.6 ± 21.8	67.2 ± 25.7	0.7941
Psychological Domain	54.8 ± 16.3	51.8 ± 14.9	0.4410
total score of KCS	48.7 ± 15.1	46.2 ± 10.6	0,4344

***p≤0,05**

Further statistical analysis included performed descriptive statistics on the health self-assessment. The results and level of differences are shown in Table 2.

Table 2. SF-36: Health self-assessment – descriptive statistics and the level of gender dimorphism

Health components and factors	Mean ± SD		p
	female	male	
physical functioning	57.8 ± 26.7	63.8 ± 19.7	0,3148
role limitations due to physical health	32.8 ± 36.2	54.7 ± 46.9	**0,0407***
pain	37.7 ± 24.3	61.3 ± 27.1	**0,0005***
general health	28.4 ± 13.6	40.4 ± 14.5	**0,0012***
Physical Component	39.2 ± 18.9	55.0 ± 22.0	**0,0030***
emotional well-being	54.2 ± 39.5	58.3 ± 44.0	0,6915
energy / fatigue	43.3 ± 18.3	49.5 ± 18.2	0,1782
role limitations due to emotional problems	62.1 ± 12.5	59.3 ± 17.8	0,4570
social functioning	54.4 ± 26.2	57.9 ± 24.5	0,5809
Mental Component	53.5 ± 17.3	56.3 ± 18.3	0,5385

***p≤0,05**

Then, examined dependence between age, BMI and elapsed time since Myocardial Infarction with both domains and total score of kinesiophobia (KCS). In men, there was no correlation. In women, the correlations between age and kinesiophobia were no found. Whereas, recorded the following correlations: BMI – BD: r=0.541, BMI – PD: r=0.560), BMI – KCS: r=0.566. Elapsed time since MI, also correlate in women. Correlation coefficients were respectively: r=0,408, r=0,591 and r=0,524, in every case: p≤0,05.

Later calculated correlations: biological domain, psychological domain and KCS – factors and components of health. In case of females, found the correlations statistically significant only in relation to health factor: physical functioning and were respectively: BD r= – 0,528; DP r= -0,619 i KCS r=-0,661. In men, only KCS correlates with factor: pain r=-

0,407.

DISCUSSION

Epidemiological data presented at the beginning, show that cardiovascular diseases have a dominant position among the diseases of civilization. Despite of prevention actions, the cardiovascular disease are the leading cause of deaths worldwide, in most European countries and also in Poland. Furthermore, they are also one of the main and still growing cause of "Disability Adjusted Life Years" (DALY), expressed as the number of years lost due to ill-health, disability or early death [18]. Regular physical activity is one of the factors, which have key importance of cardioprotective in prevention of cardiovascular diseases, including Myocardial Infarction. The protective effect of exercise concerned not only healthy persons, but also people with risk factors such as smoking and obesity, and with diagnosed chronic diseases (hypertension, diabetes, metabolic syndrome) [19,20,21].

Fear before exercise is relatively common phenomenon and may have various substrate [22]. Most often is explained as a fear before re-occurrence of pain. This approach was inspiration for authors of commonly used Tampa Scale for Kinesiophobia (TSK) [23]. This tool, originally intended for diagnosis of kinesiophobia in patients with back pain, is adapted to the study of patients with various ailments, including cardiac disease [24]. The argument is a possible negative impact of kinesiophobia on the effectiveness of rehabilitation [25,26]. This may be important in the so-called “behavioral cardiology”, which connect together behavioral and psychosocial risk of factors of ischemic heart disease [28]. Commonness of use of TSK in respect of different types of diseases, search for the possible cultural differences, connection of kinesiophobia intensity with fatigue, or functional parameters, incline to pose the questions concerning the original definition of kinesiophobia, unambiguously binding her with pain [28, 29]. The tool used in this study, analyses a broad-spectrum of a physical passivity conditions (with necessary reductionism) [15,16].

The results of our study indicate that cultural factors, (the highest average value of kinesiophobia in factor "susceptibility to social influence") may be an important determinant of activity. They confirm earlier population-based study Knapik et al [16,30]. Similarly to the cited results are also average results of the two domain, both for men and women in this range of age, allows suppose that disease is not a major determinant of fear of movement, but rather a some personality dispositions. Noticeable is also a large interindividual variability of

individual kinesiophobia factors, as indicated by the size of the standard deviations (tab. 1). Emphasize it the necessity to use in the rehabilitation process, one of the basic principles of physiotherapy - an individual approach to patient - in the context of his needs, current of psychological disposition and potential problems [31,32,33]. Definetely larger intensification of kinesiophobia in psychological domain - compared to the biological domain (tab. 2.), emphasize the importance of psychological sphere, suggest a psychological intervention if necessary.

In the present study, reported relatively lower self-assessment of health than in age comparable material from other studies [34]. Draws attention lowest average value of factor: "health-general", regardless of gender (justified by the disease) and dimorphic differences concerning the sense of physical health - in favor of men. Differences (by gender) revealed in the analysis of kinesiophobia correlations with other variables. In men, this personal disposition seems to be constans, what explain lack of correlations with age, BMI and time since MI. In women, BMI and time since MI should be take into account in rehabilitation process as well as correlation with factor: "physical functioning". In case of men, pain perception may have importance.

In most cases, Myocardial Infarction is suprising situation for patient. Direct danger to life appears suddenly and causes a lots of negative reactions in the humans psyche. While at the time of acute coronary syndrome, avoidance of any physical activity is a natural and desirable phenomenon, whereas an inability to overcome the barriers of physical activity may lead to a serious long-term consequences. Sedentary lifestyle and avoidance of physical activity in a reasonable dimension are strong predictors of next cardiac events. Identification and early diagnosis of the causes of motor passivity can be very important, both in primary and secondary prevention. This creates the necessity to further study in this area.

Ethical Approval

The study was made in accordance with the Declaration of Helsinki and commonly accepted standards of ethics. The research has been approved by Head of Department at the Institution where the work has been carried out. Questionnaires were anonymous and fill was voluntary.

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Conflict of Interest

I have no any potential conflict of interest.

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