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IMPACT OF KINESIOPHOBIA (FEAR BEFORE MOVEMENT) TO PHYSICAL ACTIVITY LEVEL IN PATIENTS WITH ARTERY HYPERTENSION

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SUMMARY

Introduction: Insufficient level of physical activity is presence in general populations as well as in patients suffer from various somatic diseases. However still is little known about risk factors of hypokinesia. To date, lack is a study directly designed to assess impact of kinesiophobia to physical activity level in patients with artery hypertension.

Aim: The aim of the study was to evaluate the degree of kinesiophobia and physical activity level in patients with arterial hypertension and examine the relationship between kinesiophobia level and physical activity level.

Material and methods: A total of 88 ($M_{age}=59,46$, $SD_{age}=9,16$) patients with diagnosed hypertension were examined. Following polish version of questionnaires were used: Kinesiophobia Causes Scale (KCS) and Habitual Physical Activity (HPA).

Results: Low level of physical activity and moderate intensity of kinesiophobia were noted. Moderate and strong correlations between domains and factors of kinesiophobia with physical activity domains were found. In addition, significant correlations between time since hypertension diagnosis with physical activity and kinesiophobia domains were also reported. High level of kinesiophobia was significantly associated with high level of physical inactivity.

Conclusions: Kinesiophobia may be an important factor contributing to limitation of physical activity and can play a significant role in modulation of physical activity level.

Key words: kinesiophobia, fear before movement, physical activity, hypertension.

INTRODUCTION

Hypertension (HTN), also referred as high blood pressure (HBP), is a chronic medical condition in which the blood vessels have persistently raised pressure. HTN is a major risk factor for coronary heart disease (CHD), heart failure, hemorrhagic stroke, kidney failure, aortic aneurysm, pulmonary embolism, and other health problems [1-4].

Worldwide prevalence estimates that nearly one billion people of the adult population had hypertension (333 million in economically developed countries and 639 million in economically developing countries), and approximately over 7 million deaths per year may be attributable to hypertension [5,6]. As of 2013, in Europe hypertension occurs in about 30-45% of people [7]. According to the latest NATPOL 2011 research results, about 32% of adult Poles suffer from arterial hypertension. This population is still rising, and it is 2% higher than ten years ago [8].

There is a significant amount of evidence that regular physical activity is beneficial for both prevention as well as treatment of hypertension [9-16]. However, based on epidemiological studies, 31% of adults aged 15 years or older were insufficiently active (men 28% and women 34%). It stimulates to searching causes of physical inactivity. One of them can be kinesiophobia, defined by Kori as „irrational, weakening and devastating fear of movement and activity stemming from the belief of fragility and susceptibility to injury”[17]. Vlaeyen et al., alternatively described this phenomenon as “fear of movement/(re)injury, a specific fear of movement and physical activity that is (wrongfully) assumed to cause re-injury” [18]. Previous studies have shown that kinesiophobia is presence in various medical conditions, such as: low back pain [19], musculoskeletal pain [20,21], fibromyalgia [22], cancer survivors [23], Coronary Artery Disease [24] and implantable cardioverter defibrillator [25]. However, lack is a study directly designed to assess occurrence of kinesiophobia degree in high blood pressure patients and impact of this phenomenon to physical activity level in this group.

There were two purposes of this study. First, was to evaluate the degree of kinesiophobia and physical activity level in patients with arterial hypertension. Second, was to examine the relationship between kinesiophobia level and physical activity level. Hypothetically, the physical activity level would be limited in patients with elevated kinesiophobia level.

MATERIAL AND METHODS

Participants

A total of 88 (47,7% females, 52,3% males; $M_{age}=59,46$, $SD_{age}=9,16$, range=42-68 years)

patients with diagnosed hypertension completed a pencil-and-paper version of self-report measures on kinesiophobia and physical activity. All participants were recruited at Upper-Silesian Medical Center in Katowice, Poland. The average time since diagnosis was approximately 6,35 years (SD=9,91).

Measures

Kinesiophobia Causes Scale (KCS). Allows to diagnose individual causes of kinesiophobia and their intensity. The scale is divided into two domains: biological and psychological. Biological domain includes the following causes of kinesiophobia: morphologic, individual need for stimulation, energetic substrates, power of biological drives, whereas psychological domain contains: self-acceptance, self-assessment of motor predispositions, state of mind and susceptibility to social influence. All answers are rated from 0 to 100, where a score of 0 would represent lack of any symptoms of kinesiophobia and 100 would mean highly kinesiophobic attitude (clinical form of fear of movement) [26].

Habitual Physical Activity - HPA questionnaire. Baecke's questionnaire includes 16 questions assessing physical activity in three areas: 1) work, 2) sport during leisure time, and 3) free time – without sports. The total score (HPA index) is an average of these indices. All responses were scored on five-point scales excluding questions concerning occupation and the types of sport played. Three levels of occupational physical activity were defined: low level such as, driving, teaching, studying, housework; the middle level such as, factory work, plumbing, carpentry; and the high level such as, construction work, professional sport. Sports were subdivided into three levels of physical activity: the low level for sports such as, billiards, sailing, bowling, and golf (average energy expenditure 0,76 MI/h); the middle level for sports such as, badminton, cycling, dancing, swimming, and tennis (average energy expenditure 1,26MI/h); and the high level for sports such as, boxing, basketball, football, rugby, and rowing (average energy expenditure 1,76 MI/h). A sport score was calculated from a combination of the intensity of the sport which was played, the amount of time per week playing that sport, and the proportion of the year in which the sport was played regularly [27].

Demographic measures. Gender, age and patient's medical history were collected with an author-compiled questionnaire.

Statistical analyses

Descriptive statistics included: means [M], standard deviations [SD], lower [Q1] and upper [Q3] quartiles. Pearson's correlation coefficient were used to assess relationship between analysed variables. Differences between groups were determined by one-way analysis of variance (ANOVA). Differences were considered significant for $p < 0,05$. All analyses were performed by use of

RESULTS

Means and standard deviations for physical activity index were as follows: work index: $1,86 \pm 0,47$; sport index: $1,44 \pm 0,41$; leisure time index: $2,07 \pm 0,75$; overall HPA index: $5,37 \pm 1,57$. Baseline values for kinesiophobia level are given in Table 1.

Table 1. Kinesiophobia Causes Scale (KCS): means [M], standard deviations [SD], lower [Q1] and upper [Q3] quartiles

Factors and domains of kinesiophobia	M	SD	Q1	Q3
morphological parameters	38,1	21,7	25,00	50,00
individual need for stimulation	51,5	19,3	37,50	62,50
energetic resources	49,6	22,6	33,33	58,33
power of biological drives	43,0	18,4	25,00	56,25
BIOLOGICAL DOMAIN [BD]	45,5	15,1	25,14	56,35
self-acceptance	42,4	20,6	37,50	56,33
self-assessment of motor predispositions	62,0	21,5	37,50	75,00
state of mind	56,8	24,0	37,50	62,50
susceptibility to social influence	63,5	21,8	50,00	75,00
PSYCHOLOGICAL DOMAIN [PD]	56,1	17,9	42,53	67,25
total score of kinesiophobia [KCS]	50,8	16,2	35,00	62,50

Correlations between domains and factors of kinesiophobia with physical activity domains are shown in Table 2. Furthermore, significant correlations between time since hypertension diagnosis and: overall HPA ($r=-0,63$; $p<0,01$), sport index ($r=-0,47$; $p<0,01$), BD ($r=0,36$; $p<0,05$), PD ($r=0,54$; $p<0,01$), KCS ($r=0,68$; $p<0,01$) were found.

Table 2. Correlations between kinesiophobia factors and domain with physical activity domains

variables	Work index	Sport index	Leisure time index	Overall HPA
morphological parameters	0,14	0,04	-0,09*	-0,13*
individual need for stimulation	-0,05	-0,27*	-0,36**	-0,40**
energetic resources	-0,29**	-0,12*	-0,17	-0,31*
power of biological drives	-0,19	-0,21*	-0,14*	-0,27*
BIOLOGICAL DOMAIN [BD]	-0,16*	-0,35**	-0,42**	-0,47**
self-acceptance	-0,15	-0,28*	-0,22	-0,16*
self-assessment of motor predispositions	-0,13	-0,39**	-0,41**	-0,39**
state of mind	-0,16*	-0,03	-0,29*	-0,33**
susceptibility to social influence	0,06	-0,38*	-0,42*	-0,46**
PSYCHOLOGICAL DOMAIN [PD]	-0,23*	-0,56**	-0,51**	-0,54**
total score of kinesiophobia [KCS]	-0,22	-0,57**	-0,49**	-0,59**

Notes: correlations statistically significant at level: * $p<0,05$; ** $p<0,01$.

Overall physical activity level – according to quartiles of kinesiophobia domains and quartiles of total score of kinesiophobia were presented in figure 1.

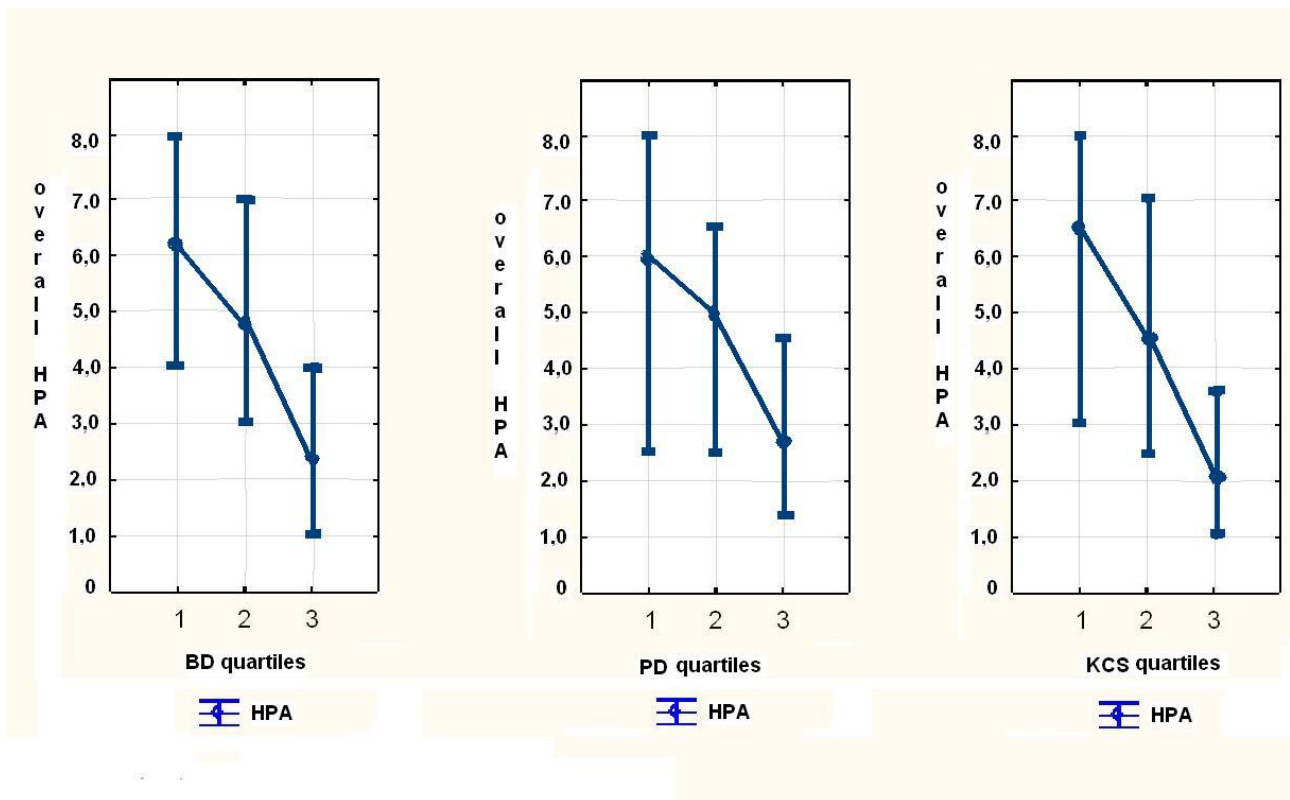


Figure 1. Physical activity level (overall HPA index) – according to quartiles of kinesiophobia.

DISCUSSION

Hypertension is an important public health challenge due to its high prevalence and strong association with cardiovascular disease and premature death and also is ranked third as a cause of disability-adjusted life-years [28,29]. Despite the availability of a number of different classes of antihypertensive drugs, a physically active lifestyle is recognised as a cornerstone for the prevention, treatment and management of hypertension. The beneficial effects of exercise training on blood pressure have been shown both in normotensive and hypertensive individuals [30,31]. Furthermore, the protective effect of physical activity was consistent in both overweight and normal weight subjects [32].

Presented in table 1 descriptive statistics showed to relatively low level of physical activity (primarily in sport domain). Similar data were found in previous studies evaluating the level of physical activity in people with high blood pressure [33-35]. However, due to the several questionnaires that are used to assess physical activity, comparison of the results to other studies, and to the general population, is hindered. Given the fact that physical activity is not only related to the leisure activity, but also refers to expenditure of energy during work (most patients declared they were professionally active) and/or sport practicing, in this study the HPA (Habitual Physical Activity) questionnaire were used.

Mean values of total score of KCS (Table 2) indicate moderate intensity of this phenomenon in studied population. The highest average values of kinesiophobia were reported in factors: self-

assessment of motor predispositions and susceptibility to social influence. These results are reflected in The Surgeon General's Report on Physical Activity and Health studies, in which found that confidence in one's ability to engage in regular physical activity, enjoyment of physical activity, support from others, positive beliefs concerning the benefits of physical activity, and lack of perceived barriers to being active were consistent influences on physical activity patterns among adults and young people in the United States [36]. Higher severity of fear before movement in psychological domain than in biological domain, emphasize the need of multifactorial and multidimensional approach to the treatment of such patients. Compared to other studies in the general population (with using of Kinesiophobia Causes Scale), similar descriptive statistics at the measurement were found [37-39]. In the light of previous cardiac studies, high level of kinesiophobia was found among 20% of patients with coronary artery disease, six months after the cardiac event [24]. With two measures (Kinesiophobia Causes Scale – KCS; Tampa Scale for Kinesiophobia - TSK) to evaluate of kinesiophobia level, decided to use KCS. This is linked with a several factors. TSK scale was originally intended for diagnosis of kinesiophobia in patients with back pain, and was adapted to the study of patients with various medical conditions, including cardiac disease. However, evaluation of intensity of kinesiophobic attitudes is not sufficient. KCS was developed to assess intensity of kinesiophobia as well as to diagnose of its individual causes. Furthermore, construction of this scale, according to holistic definition of health (including its physical and mental dimension, both influenced by social factors) allows to analyses a broader spectrum of a physical inactivity conditions and seems to be more comprehensive tool than TSK.

The primary aim of this study was to test the assumed links between kinesiophobia level and physical activity level. Correlational analysis revealed a significant, moderate and strong relationships of domains and factors of kinesiophobia with physical activity domains. Moreover, time since hypertension diagnosis was positively associated with kinesiophobia level, and negatively associated with total physical activity level and with sport during leisure time. However, perhaps the most important findings of this study was demonstrated on Figure 1. Patients with high levels of kinesiophobia showed a significantly higher level of physical inactivity compared with patients with low levels of kinesiophobia. This result provide evidence that kinesiophobia may be an important factor contributing to limitation of physical activity and can play a significant role in modulation of physical activity level. Furthermore, this finding supports the notion that psychosocial factors also contribute to presence of hypokinetic attitudes.

CONCLUSIONS

Despite the literature provides a great deal of informations about determinants of physical activity, still is little known about risk factors of hypokinesia. Results of the study presented here

allow to conclude that kinesiophobia can be a major factor leading to hypokinesia. According to this, general practitioners prescribing practice of physical exercise in the prevention or management of hypertension, should take into account individual needs and predisposition of patients, including emotional and psychological spheres. From a rehabilitation perspective, it is desirable to include the concept of kinesiophobia, in planning and designing of secondary prevention and cardiac rehabilitation of hypertension, as a factor in the potential adverse effect on the cardiac rehabilitation process. However, future research should be well-designed to investigate the effect of psychotherapeutic intervention to reduce of fear of movement and increase of physical activity level.

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