Sexual dysfunctions in men in the first 9 months after myocardial infarction

Bartosz Puchalski, Filip Szymański, Robert Kowalik,
Krzysztof Jerzy Filipiak

I Katedra i Klinika Kardiologii Warszawskiego Uniwersytetu Medycznego

Summary

Objectives. The aim of the study is to assess the frequency of sexual dysfunction in men after myocardial infarction (MI).

Methods. 62 men were asked to fill IIEF 15 to assess sexual dysfunction 3 and 9 months after MI.

Results. Erectile dysfunction (ED), orgasmic dysfunction, decreased sexual desire, decreased intercourse satisfaction, decreased overall satisfaction were recognized respectively by: 61.3%, 24.2%, 62.9%, 71%, 54.8% of men 3 months after MI, and 51.6%, 17.7%, 58.1%, 77.4%, 59.7% of men 9 months after MI. Men with ED had higher serum CRP (5.8 vs. 3.8; p=0.04) and creatinine (1 vs. 0.9; p=0,04) levels in the peri-infarction period and higher serum BNP (47.4 vs. 24.6; p=0.04) measured 3 months after MI than men without ED. They had also higher serum testosterone levels than men without ED (12.6 vs. 10.6; p=0.03). Men with decreased sexual desire had significantly lower serum DHEAs (dehydroepiandrosterone sulfate) levels in the peri-infarction period than men with normal sexual desire (191.1 vs. 224.3; p=0.044). Men with ED 9 months after MI had higher serum CRP levels in the peri-infarction period (7.5 vs. 4.6; p=0.0371). Men with orgasmic dysfunction had lower left ventricular ejection fraction (EF) measured in the peri-infarction period (0.4 vs. 0.5; p=0.0318).

Conclusions. 1. Men with ED have higher serum CRP and creatinine levels in the peri-infarction period. 2. DHEAs level has an influence on sexual desire and on erectile function after MI. 3. BNP level in post-MI patients affects erectile function. 4.EF has an impact on orgasmic function.

Key words: myocardial infarction, sexual dysfunction

Introduction

The topic of men's sexual activity after myocardial infarction is often overlooked for various reasons, even in medical interviews. Both sides can find it difficult to discuss the problem, and this intimate sphere of life is therefore frequently neglected. This is confirmed by the data from the Report on the Sexuality of Poles from 2011 which shows that most men look for help on the Internet (approximately 33.6% of respondents), while relatively few of them seek a doctor's advice [1]. Sexual dysfunction is among typical complications after myocardial infarction, and applies to most

patients. This fact was confirmed in one of the studies which demonstrated that erectile dysfunction after myocardial infarction occurred in almost 82% of men [2]. A similar study, which included a 6-month follow-up of post-MI patients, found that about 60% of them reported problems with sexual functions: about 34% – erectile dysfunction, and about 46% – decreased sexual desire [3].

Sexual dysfunction after myocardial infarction may result from various causes: the co-existence of cardiac insufficiency, which is associated with a poor cardiac output and the reduced vascular perfusion of the penis, hormonal disorders, atherosclerosis of the penis, which results in reduced synthesis of nitric oxide and the resulting decreased vascular perfusion of the penis, stress, and the disease-related depression, as well as adverse events of drugs. The coexistence of risk factors for cardiovascular disease may additionally exacerbate sexual dysfunction. These problems and very few works on sexual activity in the population of Polish men after myocardial infarction prompted us to conduct a survey in this group of patients.

Methodology

The study involved 62 patients. They were men aged 40-75 years hospitalized in the First Chair and Department of Cardiology, Medical University of Warsaw (MUW) due to the first ever myocardial infarction. The study protocol was approved by the local bioethical committee. Patients with chronic kidney disease with GFR (glomerular filtration rate) < 35 ml/min/1.7 m², with chronic cardiac insufficiency in class III, IV NYHA (New York Heart Association), with a history of myocardial infarction, recognized psychiatric and hormonal disorders were not qualified for the study. There were 53 patients with ST segment elevation myocardial infarction, and 9 patients with non-ST segment elevation myocardial infarction. There were no patients with depression, none of them took antidepressants. The stress level was not objective. The general characteristics of the study group are listed in Tab. 1.

Table 1. **Characteristics of the study group**

Age of patient (years)	
Mean ± standard deviation / range / median	54.5±6.4 / 41 – 70 / 55
Height (cm)	
Mean ± standard deviation / range / median	176±7.1 / 155 – 188 / 176
Weight (kg)	
Mean ± standard deviation / range / median	89.9±5.2 / 52 – 121 / 91
BMI (kg/m²)	
Mean ± standard deviation / range / median	28.9±4.3 / 19.3 – 41.7 / 29.1
Smoking (number of cigarettes smoked per day)	
Mean ± standard deviation / range / median	24.3±9.9 / 4 – 40 / 20
Myocardial infarction – the number of patients (%)	

STEMI	53 (85.5%)
NSTEMI	9 (14.5%)
Education – number of patients (%)	
Vocational	23 (37.1%)
Secondary	7 (11.3%)
Higher	32 (51.6%)
Marital status – number of patients (%)	
Divorced	5 (8.1%)
Married	52 (83.9%)
Widower	2 (3.2%)
Single	3 (4.8%)
Insomnia – number of patients (%)	
No	48 (77.4%)
Periodically	7 (11.3%)
Yes	7 (11.3%)
Stress – number of patients (%)	
No sense of stress	6 (9.7%)
Moderate levels of stress	34 (54.9%)
High levels of stress	22 (35.5%)
Hypertension – number of patients (%)	32 (51.6%)
Diabetes – number of patients (%)	
No	55 (88.7%)
Yes	6 (9.7%)
Impaired fasting glucose	1 (1.6%)
WBC (thou/ul)	
Mean ± standard deviation / range / median	11.1±2.8 / 4.9 – 17.7 / 10.7
MPV (fL)	
Mean ± standard deviation / range / median	10.1±1.2 / 7.4 – 13.5 / 10.1
HGB (g/dl)	
Mean ± standard deviation / range / median	15.8±3.5 / 12.6 – 19.5 / 14.4
TLC (mg/dl)	
Mean ± standard deviation / range / median	199.4±38.1 / 133 – 313 / 200.5
HDL (mg/dl)	
Mean ± standard deviation / range / median	40.6±10.3 / 24 – 77 / 38.5
LDL (mg/dl)	
Mean ± standard deviation / range / median	123.6±30.3 / 0 – 193 / 122.5

TGL (mg/dl)	
Mean ± standard deviation / range / median	180.5±85.7 / 73 – 434 / 160
TSH (uIU/ml)	
Mean ± standard deviation / range / median	1.7±2.2 / 0.33 – 17.6 / 1.2
Creatinine (mg/dl)	
Mean ± standard deviation / range / median	0.9±0.2 / 0.6-1.3 / 0.9
CRP (mg/l)	
Mean ± standard deviation / range / median	11.2±15.8 / 0.5 – 69.8 / 5.2
PRL (ng/ml)	
Mean ± standard deviation / range / median	7.9±3.5 / 0.9 – 18.2 / 7.6
DHEAs (ug/dl)	
Mean ± standard deviation / range / median	207.5±89.9 / 37.03 – 440.6 / 202
EF (2-5 day of myocardial infarction)	
Mean ± standard deviation / range / median	0.5±0.1 / 0.22 – 0.6 / 0.49

Abbreviations used in the table: STEMI – ST segment elevation myocardial infarction, NSTE-MI – non-ST segment elevation myocardial infarction, TLC – total cholesterol, HDL – high density lipoprotein, LDL – low density lipoprotein, TGL – triglicerides, TSH – thyroid stimulating hormone, CRP – C-reactive protein, PRL – prolactin, HGB – hemoglobin, MPV – mean platelet volume, WBC – white blood cells, DHEAs – dehydroepiandrosterone sulfate, EF – ejection fraction.

After obtaining a patient's informed, written consent to participate in the study, a thorough medical history and physical examination were carried out to identify cardiovascular disease risk factors. All patients were subjected to sexual performance assessment 3 and 9 months after myocardial infarction based on IIEF 15 (International Index of Erectile Function Questionnaire 15). The following sexual components were evaluated:

– erectile function,
– orgasmic function,
– sexual desire,
– intercourse satisfaction,
– overall satisfaction.

Erectile function was assessed with 6 questions. The maximum score possible was 30 points. A score below 25 points was considered abnormal (ED). Orgasmic function was assessed based on 2 questions. The maximum number of points was 10. A score below 9 points was considered abnormal. Sexual desire was assessed based on 2 questions. The maximum score possible was 10 points. A score below 9 points was considered abnormal. Intercourse satisfaction was assessed using 3 questions. The maximum score possible was 15 points. In this case, the limit value was 13 points. Overall satisfaction was assessed based on 2 questions. The maximum score possible was 10 points. A score below 9 points was considered abnormal (Tab. 2).

Table 2. **Scores of the International Index of Erectile Function Questionnaire 15**

	Abnormal result
Erectile dysfunction	< 25 points
Orgasmic dysfunction	< 9 points
Decreased sexual desire	<9 points
Decreased intercourse satisfaction	< 13 points
Decreased overall satisfaction	< 9 points

Between the second and the fifth day of myocardial infarction, serum BNP (B-type natriuretic peptide) and free testosterone were determined. BNP was determined from venous blood samples using a rapid diagnostic test, Biosite's Triage BNP (immunofluorometric test to quantitate concentrations of blood markers). According to the current recommendations of cardiology, it is a sensitive marker of cardiac insufficiency. The concentration of free serum testosterone was determined in the Central Laboratory of the Independent Public Central Clinical Hospital, Medical University of Warsaw from venous blood samples collected between 6 a.m. and 8 a.m. In addition, other endocrine parameters and biomarkers of the fundamental cardiovascular risk factors were evaluated: lipids, blood glucose, peripheral blood counts, creatinine, TSH (thyroid stimulating hormone), PRL (prolactin), DHEAs (dehydroepiandrosterone sulfate), CRP (C-reactive protein). Then, 3 months after myocardial infarction, sexual performance, BNP and free testosterone levels of the patients were assessed. Another examination was carried out 9 months after myocardial infarction and the above mentioned elements were re-evaluated. The collected data were analysed statistically.

Statistical Methodology

All statistical calculations were performed using the statistical package StatSoft, Inc. STATISTICA, 2011 (version 10.0. www.statsoft.com) and an Excel spreadsheet.

Quantitative variables were characterized using the arithmetic mean, standard deviation, median, minimum and maximum values (range). Qualitative variables were presented by means of numbers and percentages. The distribution of variables was tested using the Shapiro-Wilk test, and equality of variances with Levene's test (Brown-Forsythe).

The significance of differences between two groups (the model of uncorrelated variables) was checked using Student's t-test (or in the absence of homogeneity of variance – Welch's test) or Mann-Whitney U test (if the conditions of the Student's t-test applicability were not fulfilled, or in the case of variables measured on the ordinal scale). The significance of differences between more than two groups was examined with F test (ANOVA) or Kruskal-Wallis test (where the conditions of ANOVA applicability were not met). Post hoc tests (Tukey's test for F, Dunn's test for Kruskal-Wallis test) were used for statistically significant differences between groups.

For the model of two correlated variables, the Student's t-test or Wilcoxon signed-rank test were used. The significance of differences between more than two in the model

of correlated variables was checked using a repeated measures analysis of variances or Friedman test. Chi-square test of independence was used for quantitative variables.

In order to establish correlations, strength and directions between variables, the correlation analysis was applied by calculating Pearson's and/or Spearman's correlation coefficients.

The level of significance was p=0.05.

Results

The tables provide only statistically significant data.

Table 3. **Concentration of BNP during the 9-month follow-up**

BNP (pg/ml)	Period 0	Period 3	Period 9	K-W=39.13 p=0.0001 [12]0.0001
Mean ± standard deviation	150.0±164.4	57.5±67.1	48.1±7 3.8	
Range	10.4 – 920	5.8 – 399	5 – 477	
Median	99.1[12]	39.6[1]	29.3[2]	
95% CI	[108.3;191.8]	[40.4;74.5]	[29.3;66.8]	

BNP – B-type natriuretic peptide, period 0 – peri-infarction period ($2^{nd} - 5^{th}$ day after myocardial infarction), period 3 – 3 months after myocardial infarction , period 9 – 9 months after myocardial infarction, KW – Kruskal-Wallis test, p – level of statistical significance

In the group of men, BNP decreased in the subsequent follow-up periods (Tab. 3). Changes in free testosterone concentrations in the subsequent follow-up periods were not statistically significant. The individual components of sexual activity, such as erectile function, orgasmic function, the level of sexual desire, intercourse satisfaction, overall satisfaction, the number of intercourses did not change significantly in the subsequent follow-up periods.

Table 4. **Sexual dysfunction in the study group 3 months after myocardial infarction**

	The experimental group – number of patients (% of patients)
Erectile dysfunction	38/61.3%
Orgasmic dysfunction	15/24.2%
Decreased sexual desire	30/62.9%
Decreased intercourse satisfaction	44/71%
Decreased overall satisfaction	34/54.8%

In this group, 3 months after myocardial infarction, it was found that erectile dysfunction occurred in over 60% of men, orgasmic dysfunction in nearly a quarter of respondents, decreased sexual desire in more than 60%, decreased intercourse satisfaction in more than 70 %, decreased overall satisfaction in more than half of the men (Table 4).

In order to assess the impact of various factors on sexual functions, patients were divided into those who had sexual dysfunctions after myocardial infarction and those whose individual components of sexual activity were normal.

Table 5. **Erectile dysfunction 3 months after myocardial infarction**

	Yes	No	Statistical test
CRP (mg/l)			M-WU=313.5 p=0.0402
Mean ± standard deviation / range / median	13.5±17/ 0.5-69.8/5.8	7.5±13.1/0.5-66.5/3.8	
Number of intercourses per month			M-WU=211 p=0.0004
Mean ± standard deviation / range / median	3.7±2.9/1.5-11/3.5	6.6±2.9/1.5-11/7	
Creatinine (mg/dl)			t=-2.05 p=0.0444
Mean ± standard deviation / range / median	1±0.2/0.7-1.3/1	0.9±0.1/0.6-1.1/0.9	
BNP (pg/ml)			M-WU=318.5 p=0.0477
Mean ± standard deviation / range / median	65.1±69.1/6.2-399/47.4	45.4±63.3/5.8-322/24.6	
Testosterone (nmol/l)			M-WU=312.00 p=0.0381
Mean ± standard deviation / range	14.4±6/6.3-36.1/12.6	11.4±4.2/5.8-21/10.6	
Age (years)			t=-2.73 P=0.0084
Mean ± standard deviation	51.9±5.9	56.2±6.1	
Range	41–64	44-70	
Median	56.5	52.5	

CRP – C-reactive protein, BNP – B type natriuretic peptide, M-WU – Mann-Whitney U test, t – Student's t-test,p – level of statistical significance

Men with erectile dysfunction assessed 3 months after myocardial infarction had significantly higher serum CRP and creatinine in the peri-infarction period, and higher serum BNP measured 3 months after MI than men without erectile dysfunction. The men were younger and had higher serum testosterone compared to men without erectile dysfunction. The frequency of sexual activity of men with erectile dysfunction was lower than the frequency of sexual activity of men without erectile dysfunction (Tab. 5).

Table 6. **Orgasmic dysfunction 3 months after myocardial infarction**

	Yes	No	Statistical test
Number of intercourses per month			M-WU=197.5 p=0.0111
Mean ± standard deviation / range / median	2.8±1.6/1.5-5.5/1.5	5.4±3.3/1.5-11/5.5	
Education			Chi^2=11.21 p=0.0037
Vocational Secondary Higher	11/73.3% 1/6.7% 3/20%	12/25.5% 6/12.8% 29/61.7%	
Medication before MI	1/6.7%	16/34%	Chi^2=4.28 p=0.0385

M-WU – Mann-Whitney U test, p – level of statistical significance, medication before MI – defined as the use of any of the following drugs: acetylsalicylic acid, beta-blockers, angiotensin-converting enzyme inhibitor, sartan, statin, metformin

The frequency of sexual activity of men with orgasmic dysfunction 3 months after myocardial infarction was significantly lower than the frequency of sexual activity of men without this dysfunction. There were significantly fewer men with higher education among patients with orgasmic dysfunction 3 months after myocardial infarction. These men rarely took medication before myocardial infarction due to chronic diseases (Tab. 6).

Table 7. **Decreased sexual desire 3 months after myocardial infarction**

	Yes	No	Statistical test
DHEAs (ug/dl)			t=-2.09 p=0.044
Mean ± standard deviation / range / median	187.9±71.7/37-373.1/191.1	240.8±108.1/42.3-440.6/224.3	
Number of intercourses per month			M-W U=253.5 p=0.0046
Mean ± standard deviation / range / median	3.8±2.6/1.5-11/3.5	6.4±3.5/1.5-11/5.5	

DHEAs – dehydroepiandrosterone sulfate, t – Student's t-test, M-WU – Mann-Whitney U test, p – level of statistical significance

Men with decreased sexual desire (assessed 3 months after myocardial infarction) had significantly lower serum DHEAs in the peri-infarction period compared to men with normal sexual desire. The frequency of sexual activity of men with decreased sexual desire was lower than that of men with normal sexual desire (Table 7).

The frequency of sexual activity of men with reduced overall satisfaction (assessed 3 months after myocardial infarction) was lower than that of men satisfied with their sex life. There were more men complaining about a high level of stress in daily life among patients with decreased overall satisfaction (Table 8 – *next page*).

Table 8. **Decreased overall satisfaction 3 months after myocardial infarction**

	Yes	No	Statistical test
Number of intercourses per month			M-WU=294.5 p=0.0105
Mean ± standard deviation / range / median	3.9±3/1.5-11/3.5	5.9±3.2/1.5-11/5.5	
Stress No stress Moderate High	3/8.8% 14/41.2% 17/50%	3/10.7% 20/71.4% 5/17.9%	Chi^2=5.27 p=0.0289

M-WU – Mann-Whitney U test, p – level of statistical significance

Table 9. **Decreased intercourse satisfaction 3 months after myocardial infarction**

	Yes	No	Statistical test
Age			t=2.07 p=0.0423
Mean ± standard deviation / range / median	55.6±6/44-70/56	52±6.7/41-63/53.5	
Number of intercourses per month			M-WU=25.5 p=0.0001
Mean ± standard deviation / range / median	3.1±1.9/1.5-8.5/3.5	8.8±1.9/5.5-11/8.5	

t – Student's t-test, M-WU – Mann-Whitney U test, p – level of statistical significance

Men with reduced intercourse satisfaction were older, and the frequency of their sexual activity was lower (Tab. 9).

Table 10. **Sexual dysfunctions 9 months after myocardial infarction**

	The experimental group - number of patients (% of patients)
Erectile dysfunction	32/51.6%
Orgasmic dysfunction	11/17.7%
Decreased sexual desire	36/58.1%
Decreased intercourse satisfaction	48/77.4%
Decreased overall satisfaction	37/59.7%

It was found that in the study group, 9 months after myocardial infarction, erectile dysfunction occurred in more than half of men, orgasmic dysfunction in 18% of patients, decreased sexual desire in 58%, decreased intercourse satisfaction in 77%, and decreased overall satisfaction in 60% of men (Tab. 10).

Table 11. **Erectile dysfunction 9 months after myocardial infarction**

	Yes	No	Statistical test
Height (cm)			t=-2.37 p=0.0209
Mean ± standard deviation / range / median	174±7.2/155-186/174.5	178.1±6.5/168-188/178	
CRP (mg/l)			M-WU=331.5 p=0.0371
Mean ± standard deviation / range / median	14.8±18.2/0.5-69.8/7.5	7.3±11.8/0.5-66.5/4.6	
DHEAs (ug/dl)			M-WU=338 p=0.0462
Mean ± standard deviation	190.2±85	226±92.7	
Range	89.5-440.6	37-435.7	
Median	179.3	221	
Number of intercourses per month			M-WU=271.5 p=0.0034
Mean ± standard deviation / range / median	3.2±2/1.5-8.5/1.5	5.4±3/1.5-11/5.5	

DHEAs – dehydroepiandrosterone sulfate, CRP – C-reactive protein, M-WU – Mann-Whitney U test, t – Student's t-test, p – level of statistical significance

Men with erectile dysfunction (assessed 9 months after myocardial infarction) were shorter, had higher serum CRP levels and lower serum DHEAs levels in the peri-infarction period, and the frequency of their intercourses was lower (Tab. 11).

Table 12. **Orgasmic dysfunction 9 months after myocardial infarction**

	Yes	No	Statistical test
EF			M-WU=163.5 p=0.0318
Mean ± standard deviation / range / median	0.4±0.1/0.2-0.6/0.4	0.5±0.1/0.2-0.6/0.5	

EF – ejection fraction, M-WU – Mann-Whitney U test, p – level of statistical significance

Men with orgasmic dysfunction (9 months after myocardial infarction) had lower left ventricular ejection fraction assessed between the second and the fifth day of myocardial infarction (Tab. 12).

Table 13. **Decreased sexual desire 9 months after myocardial infarction**

	Yes	No	Statistical test
Number of intercourses per month			M-WU=318.5 p=0.0335
Mean ± standard deviation / range / median	3.4±1.9/1.5-8.5/3.5	5.4±3.3/1.5-11/5.5	

M-WU – Mann-Whitney U test, p – level of statistical significance

The frequency of sexual activity of men with decreased sexual desire was lower than that of men with normal sexual desire (assessed 9 months after myocardial infarction) (Table 13).

Table 14. **Decreased overall satisfaction 9 months after myocardial infarction**

	Yes	No	Statistical test
Number of intercourses per month			M-WU=310.5 p=0.0297
Mean ± standard deviation / range / median	3.6±2.6/1.5-11/3.5	5.1±2.8/1.5-11/5.5	

M-WU – Mann-Whitney U test, p – level of statistical significance

Men with reduced overall satisfaction (assessed 9 months after myocardial infarction) had less frequent intercourses than men satisfied with their sex life (Table 14).

Table 15. **Reduced intercourse satisfaction 9 months after myocardial infarction**

	Yes	No	Statistical test
Number of intercourses per month			M-WU=55.5 p=0.0001
Mean ± standard deviation / range / median	3.2±2/1.5-11/3.5	7.6±2.2/3.5-11/8.5	

M-WU – Mann-Whitney U test, p – level of statistical significance

The frequency of sexual activity of men (assessed 9 months after myocardial infarction) with reduced intercourse satisfaction was lower than that of men satisfied with sexual intercourses (Tab. 15).

The particular sexual dysfunctions assessed, such as: erectile dysfunction, orgasmic dysfunction, decreased sexual desire, decreased intercourse satisfaction, decreased overall satisfaction did not differ statistically significantly 3 and 9 months after myocardial infarction.

Discussion

Men taking part in this study were patients hospitalized for their first ever myocardial infarction. In most cases, myocardial infarction was not complicated by cardiac insufficiency. This is evidenced by the relatively preserved left ventricular ejection fraction (mean value in the study group is 50%). Therefore, a small damage to the heart did not have a significant effect on individual sexual functions and serum free testosterone (no statistically significant differences in the 9-month follow-up). However, a serum BNP decrease was reported during the study, reflecting the normal course of recovery of post-infarction patients. The present study demonstrated that erectile dysfunction correlates with CRP concentration in the peri-infarction period. Similar findings are reported in a study by Billups et al. which shows that men with sexual dysfunction caused by atherosclerosis of penile arteries have higher serum CRP [4,5]. Creatinine concentration shows similar correlations. Analogous conclusions were presented in a study on patients with chronic kidney disease at different stages of the disease, in which

serum creatinine concentration showed a direct correlation with erectile dysfunction [6]. Men with orgasmic dysfunction had lower left ventricular ejection fraction. A positive correlation of this parameter with the severity of sexual dysfunction was confirmed in several studies. In one study which involved 85 men, sexual dysfunction was found in 76% of patients with left ventricular systolic dysfunction. Men with an ejection fraction < 55% performed poorly in the IIEF 5, but with an ejection fraction > 55% they significantly improved [7]. Another study demonstrated that the ejection fraction is an independent predictor of erectile dysfunction in patients with risk factors for cardiovascular disease [8]. Our study also demonstrates that patients with higher education are less likely to report sexual dysfunction problems. Higher education probably determines health-promoting behaviours. Similar conclusions were confirmed in study which was performed in Turkey on about 2000 men above 40 years old. Sexual dysfunction were more common in men without education. This fact suggest that educational has an impact on erectile dysfunction [9]. If left untreated, cardiovascular diseases contribute to the development of sexual dysfunctions, while taking medication because of these conditions does not significantly affect the orgasmic function. This paper also confirms that men with some sexual dysfunctions, such as erectile dysfunction, reduced sexual desire, have lower levels of DHEAs [10, 11]. On the other hand, it was found that men with erectile dysfunction evaluated 3 months after myocardial infarction were younger, had higher serum testosterone than men with normal erectile function. Perhaps age, as well as too few respondents contributed to this surprising result. However, it can also be explained otherwise. Myocardial infarction is a major aggravating factor affecting the psyche of patients. Approximately 22.5% of men manifest symptoms of depressed mood. In some of them, they are temporary and disappear within a few days, but in some men they have a greater severity, and last longer, giving symptoms that may suggest depression. Sometimes anxiety and depression can be primary reason of erectile dysfunction [12]. Depression after myocardial infarction and coexisting erectile dysfunction are connected with high risk of death due to cardiovascular reasons [13, 14]. In the 90s, studies of patients with acute myocardial infarction found that they suffered from symptoms of anxiety, increased nervousness, lack of willingness to act, and sadness known as „vital exhaustion". The impact of psychological factors on somatic symptoms presented by patients is indisputable. The existence of relationships between mental and physiological processes has been proved [15]. It is highly probable that high levels of testosterone and decreased erectile function demonstrated in the paper is the result of depressive disorders. Perhaps a sense of lower self-esteem in younger patients after myocardial infarction is much larger, which clearly explains their poor quality erections compared with the older population of patients. The psychological factors of erectile dysfunction should be therefore minimized in post-MI patients who have no objective reasons for the above concerns. There are studies that allow for accurate assessment of the risk of sexual activity in patients after myocardial infarction. According to the AHA (American Heart Association) guidelines on sexual activity in patients with cardiovascular disease, the exercise test is efficient for diagnosing people in whom physical activity causes ischemia. If a patient is able to exercise with a 5 MET (metabolic equivalent) capacity with no ischemic ECG changes, this means

that sexual activity is safe [16]. It has also been shown that the frequency of sexual activity significantly decreases in men after myocardial infarction with concomitant sexual dysfunction. A similar study found that about 72.2% of men have fewer sexual intercourses than before myocardial infarction, and only 27.8% at the same frequency. Erection problems after myocardial infarction were reported by 31.5% of respondents, compared to 68.5% who did not notice a significant change. Sexual activity significantly decreased in the observed group. One third of the men confirmed lower frequency of sexual intercourses after myocardial infarction, compared with the period before the attack. Approximately 33.3% of respondents had at least one erection problem in the past 6 months, 29.6% reported loss of interest in sexual activity, 31.5% were afraid of intercourse in relation to the subjectively perceived reduced exercise reserve, and only 18.5% observed no changes [17].

A limitation of this study is the small number of patients (62 men), and certainly the fact of the survey. Furthermore, penile vascular tests were not performed in the examined men, which would probably show the etiology of sexual dysfunction.

Conclusions

1. Men with erectile dysfunction during the first 9 months after myocardial infarction have higher serum CRP in the peri-infarction period.
2. Men with erectile dysfunction during the first 3 months after myocardial infarction have higher serum creatinine in the peri-infarction period.
3. The concentration of DHEAs in the peri-infarction period is a factor affecting the degree of sexual desire within the first 3 months after myocardial infarction.
4. Post-MI serum BNP is a factor affecting erectile function.
5. Left ventricular ejection fraction is a factor affecting orgasmic function in patients after myocardial infarction.
6. Age affects the degree of intercourse satisfaction.
7. Erectile and orgasmic dysfunctions reduce the frequency of sexual activity.
8. The level of education has an impact on some components of sexual life.
9. A high level of stress has an impact on the degree of overall satisfaction.

Сексуальные дисфункции у мужчин в течение первых 9 месяцев после перенесенного инфаркта миокарда

Содержание

Задание. Оценка частоты появления сексуальных дисфункций у мужчин, перенесших инфаркт миокарда (ИМ).

Метод. Проведение оценки нарушений сексуальной жизни мужчин после ИМ. В группе было 62 мужчин, а оценка проведена при помощи глоссария ИИЕФ-15 после 3 и 9 месцев после ИМ.

Результаты. Нарушение эррекции (НЭ), нарушение ожидания оргазма (ОО), сниженная потребность в сексуальном влечении, сниженная сатисфакция с полового акта, сниженное удовлетворение сексуальной жизни – все это отмечено у мужчин, соответственно в 61,3, 24,2, 62,9, 71, 54,8 %% исследованных после трех месцев после ИМ, тогда как после 9 месцев после ИМ – 51,6, 17,7, 58,1, 77,4 , 59,7 %%. Мужчины с НЭ содержали более высокую

концентрацию С-реактивного белка в плазме ЦРП (5,8– 3,8, p = 0,0 4) и креатина (1–0,9, p = 0,04) в пред-инфарктном периоде, более высокое содержание ЬНП (47,4–24,6, p = 0,04), оцененные после 3 месяцев от ИМ в сравнении с мужчинами с НЭ. Эти мужчины содержали более высокие концентрации тестостерона в сравнение с мужчинами без НЭ (12,6–10,6, p = 0,03. Мужчины с меньшей потребностью полового сношения имели меньшее содержание сульфита дегидроэпиандростерона/ в околоинфарктном периоде в сравнение с мужчинами с норальным половом влечении (191,1–224,3, p = 0,044 . Мужины с НЭ после 9 месяцев от ИМ содержали более высокую концентрацию ЦРП в околоинфарктном периоде) 7,5– 4,6, p = 0,0371.

Мужчины с нарушенной способностью достижения оргазма имели более низкую фракцию выброса левого желудочка сердца в околоинфарктном периоде (0,4– 0,5, p = 0,0318).

Выводы. 1. Мужчины с нарушенной эррекцией после перенесенного ИМ характеризуются высшим уровнем ЦРП в плазме и креатинина в околоинфарктном периоде. 2. Сульфат дегидроэпиандростерона является фактором, влияющим на степень полового влечения, а также на способность эррекции после ИМ. 3. БНП является фактором, влияющим на способность достижения эррекции. 4. Фракция левого сердечного желудочка является фактором, влияющим на способность достижения оргазма у пациентов после перенесенного инфаркта миокарда.

Ключевые слова: инфаркт миокарда, сексуальные дисфункции

Sexuelle Dysfunktion bei Männern in ersten 9 Monaten nach Infarkt

Zusammenfassung

Ziel. Die Bewertung der Häufigkeit der sexuellen Dysfunktionen bei den Männern nach dem Herzinfarkt (MI).

Methode. 62 Männer wurden auf die Störungen der sexuellen Funktionen mittels des Fragebogens IIEF-15 nach 3 und 9 Monaten nach dem Herzinfarkt.

Ergebnisse. Erektionsstörungen (ED), Dysfunktionen beim Orgasmus, gesunkenes Sexualbegehren, gesunkene Zufriedenstellung mit dem Geschlechtsverkehr, gesunkene Zufriedenheit mit dem Sexualleben traten entsprechend bei: 61,3%, 24,2%, 62,9%, 71%, 54,8% der Untersuchten nach 3 Monaten nach dem Herzinfarkt, dagegen nach 9 Monaten bei: 51,6%, 17,7%, 58,1%, 77,4%, 59,7%. Die Männer mit ED hatten eine höhere Konzentration von CRP im Blutserum (5,8 vs. 3,8; p= 0,04) und Keratin (1 vs. 0,9; p= 0,04) in der Peri - Infarktszeit, eine höhere Konzentration von BNP (47,4 vs. 24,6; p= 0,04), bewertet 3 Monate nach MI im Vergleich mit den Männern ohne ED. Diese Männer hatten eine höhere Konzentration von Testosteron im Vergleich mit den Männern ohne ED (12,6 vs. 10,6; p= 0,03). Die Männer mit dem gesunkenen Sexualbegehren hatten eine kleinere Konzentration von DHEAs (Dehydroepiandrosteron - Sulfat) in der Peri – Infarktszeit im Vergleich mit den Männern mit dem richtigen Sexualbegehren (19,1 vs. 224,3; p= 0,044). Die Männer mit ED hatten 9 Monate nach MI eine höhere Konzentration von CRP im Blutserum in der Peri – Infarktszeit (7,5 vs. 4,6; p= 0,0371). Die Männer mit den Dysfunktionen beim Orgasmus hatten eine niedrigere Ejektionsfraktion des linken Ventrikels in der in der Peri – Infarktszeit (0,4 vs.0,5; p= 0,0318).

Schlussfolgerungen. 1. Die Männer mit ED nach MI haben höhere Konzentration von CRP und Keratin im Blutserum in der Peri – Infarktszeit. 2. DHEAS ist ein Faktor, der den Grad des Sexualbegehrens und Erektion nach MI bestimmt. 3. BNP ist ein Faktor, der das Auflösen der Erektion beeinflusst. 4. EF ist ein Faktor, der den Orgasmus bei den Patienten mit MI beeinflusst.

Schlüsselwörter: Infarkt, sexuelle Dysfunktionen

Les dysfonctions sexuelles des hommes durant 9 mois après l'infarctus du myocarde (IDM)

Résumé

Objectif. Analyser la fréquence des dysfonctions sexuelles des hommes après l'infarctus du myocarde (IDM).

Méthode. On examine 62 hommes avec le questionnaire IIEF-15 après 3 et 9 mois après IDM.

Résultats. L'impuissance sexuelle (erectile dysfonction - ED), dysfonctionnement orgasmique, désir sexuel diminué, satisfaction sexuelle réduite, contentement de vie réduit sont notés respectivement : 61,3%, 24,2%, 62,9%, 71%, 54,8% après 3 mois ; 51,6%, 17,7%, 58,1%, 77,4%, 59,7% - après 9 mois. Les hommes avec ED ont la plus grande concentration de CRP dans le sérum (5,8 vs 3,8 ; p=0,04) et de créatinine (1 vs 0,9 ; p=0,04) dans la période juste après IDM ; ils ont aussi la plus grande concentration de BNP (47,4 vs 10,6 ; p=0,04) après 3 mois après IDM. Ces hommes avec ED ont encore la plus forte concentration de testostérone (12,6 vs 10,6 ; p=0,03). Les hommes avec le désir sexuel diminué ont la concentration réduite de DHEAs (dehydroepiandrosterone sulfate) – 191,1 vs 224,3, p=0,044. Les hommes avec ED après 9 mois après IDM ont plus grande concentration de CRP juste après IDM (7,5 vs 4,6 ; p=0,0371). Les hommes avec le dysfonctionnement orgasmique ont la fraction d'éjection ventriculaire gauche (EF) réduite dans la période juste après IDM – 0,4 vs 0,5 ; p=0,0318).

Conclusions. 1. Les hommes avec ED après IDM ont la plus grande concentration de CRP et de créatinine dans la période juste après IDM. 2. DHEAs influe sur le désir sexuel et sur l'érection après IDM. 3. BNP est un facteur influant sur l'érection. 4. EF est un facteur influant sur l'orgasme des patients après IDM.

Mots clés : infarctus du myocarde, dysfonctions sexuelles

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