Original Article

Age and Psychologic Disorders. Variables Associated to Post-Infarction Sexual Dysfunction

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Objective

Data on sexual disfunction (SD) after myocardial infarction (MI) are sketchy, especially in our community and in regard to predictors. Both males and females, with active sexual life and no sexual dysfunction prior to MI were evaluated in order to investigate SD incidence after MI, as well as to identify the possible variables associated.

Methods

Forty-three patients were studied consecutively, through structured questionnaires for SD and psychological disorders (PD) diagnosis. The interference of classic risk factors was analysed for atherosclerosis, for PD and for the use of medications when SD was present up to month 6 after MI.

Results

After MI, 91% of patients resumed sexual activity. Twenty-six patients (60%) reported sexual dysfunction up to month 6 from hospital discharge (9 with precocious ejaculation (PE), 15 with erectile dysfunction (ED), and 20 with hypoactive sexual desire disorder (HSDD). PD patients reported sexual dysfunction at higher frequency as compared to those who did not report PD (100% x 47%, p=0.001). The sexual dysfunction group was significantly older than the group not reporting sexual dysfunction: 53±8.9 years of age versus 47±8.7 years of age (p=0.04).

Conclusion

Patients reported significant reduction of sexual activity frequency and high incidence of SD after acute myocardial infarction (AMI). PD and older age were shown to be associated to higher incidence of post-infarction SD.

Key words

sexual dysfunction, acute myocardial infarction (AMI), psychological disorders, ageing

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The study of sexuality, as well as dignosis and treatment of associated disorders, have been in charge of Psychiatry for decades. Having that in mind, why would we - cardiologists - worry about the topic? First, because sexual activities act as a relevant component to life quality standard, they are associated to longevity[1], and are a frequent practice[2]. Additionally, many erectile dysfunction predictors, such as: age, diabetes, hypertension, dyslipidemia, anxiety and depression are also risk factors for coronary heart disease (CHD) disease[3,4]. Consequently, high prevalence of sexual dysfunction is not uncommon in acute myocardial infarction (AMI) diagnosis[5,6]; neither is high incidence of sexual disorders after the coronary event, ranging from 24% to 89% of all cases depending on the population under study[7-17]. Despite that, physicians do not usually approach the subject with their patients[7,18]; when they do, information provided is usually superficial and restrictive[16]. That may be due to some concern regarding risks posed by sexual activity, although information is available on it being safe[19-24]; or else, from the taboo the topic is involved in. Additionally, information made available by the literature on post-infarction sexual dysfunction predictors are sketchy, especially in regard to patients not reporting disorders prior to the coronary event. The authors are not aware, either, of any publication addressing the topic. With that in mind, the objectives of this paper were: study the incidence of sexual behavior changes after AMI, and identify possible variables associated to sexual dysfunction in patients not reporting dysfunction prior do the coronary event.

Methods

The study protocol included both males and female patients, in the 18-75-year-old range, hospitalized with defined criteria for AMI[5], reporting no previous sexual dysfunction, provided they were not included in any of the exclusion criteria: previous sexual dysfunction, no informed consent signed by patient, previous infarction, heart failure functional class II and IV, refractory angina pectoris, documented episodes of sustained ventricular tachycardia, and drugs that might cause sexual dysfunction: espironolactone, antidepressants, neuroleptics, clonidine, alfa methyl dopa, reserpine, digitalis, tiazidic diuretics, and hydralazine.

Patients were given standard information on resuming sexual activities before hospital discharge[26], and were also informed on the research. If in agreement, patients would then sign the informed consent. Patients would return on month 6 after AMI; at that point in time, patients would fill out two questionnaires. The ques-

tionnaire on sexual behavior was carried out individually, in full privacy, always after a first contact, and always with the same physician, with the purpose of reducing embarrassement and shyness associated to the issue[27,28]. The *Self Report Questionary* (S.R.Q) (table I) prepared by the World Health Organization to evaluate mental health in the different communities, was validated in different countries, ours included, by Mari and collaborators, as a screener for conditions such as anxiety and depression. The questionnaire reported good indices of sensitivity and specificity[29,30]. It included twenty questions, with two possibilities for answers: yes or no. All affirmative answers would count 1 point to the score, individually, with total score of 20 points. Score at or higher than 7 was an indicator of psychological disorders such as anxiety and/or depression. Based on questionnaire answers on sexual behavior, sexual dysfunction was defined as in the Diagnostic and Statistical Manual of Mental Disorders, fourth edition, (DSM-IV), elaborated by the American Psychiatric Association[31].

Statistical analysis was carried out through Wilcoxon test to evaluate sexual activity frequency before and after AMI[32]. At a first moment the analysis was carried out for the sample as a whole, so as to check whether there had been any reduction in sexual intercourse frequency. Mann-Whitney test was used with the purpose of investigating sexual activity frequency in the dysfunction group, in the group with or without dysfunction, before and after AMI, and for variables under study[32]. Chi-square test was used to investigate the difference of categoric variables frequency among groups with and without sexual dysfunction. Whenever COCHRAN restrictions were reported, Fisher exact test was applied[32]. The rejection level of the nullity hypothesis was set at 0.05 or 5% ($\alpha \leq 0.05$) for all tests. Asterisks indicate significant values.

Results

One hundred and sixteen AMI cases were evaluated, 81 of them were males (69.8%). From those, seventy-three patients (62.9%) reported some sort of intercurrence, or other reasons to keep them from being included in the study (table II). At a first moment, forty-three patients were included in the protocol: 6 (14%) females and 37(86%) males. Patients resumed their sexual activities 20.5±15 days after the event, and four of them (9.3%) had not resumed their sexual activities after six months. Patients reported a reduction of sexual intercourses per month after AMI: from eight down to 5 intercourses ($p<0.001$).

From the 37 male patients, 23 (62.2%) reported the following diagnoses: 17 (45.9%) - hypoactive sexual desire disorder (HSDD), 15 (40.5%) - erectile dysfunction; and 9 (24.3%) - precocious ejaculation. For 14 patients, more than one diagnosis was obtained. From the six women included in the protocol, 3 (50%) reported sexual dysfunction. Three of them had hypoactive sexual desire disorder (HSDD); from those, two had sexual arousal disorder and anorgasmy.

The groups with or without dysfunction were similar in regard to sexual activity frequency and quality standard before infarction and also regarding clinical variables under study (table III). No significant statistic difference was reported in regard to fear of cardiovascular complications during intercourse, prevalence of risk factors for atherosclerosis, or the treatment used for the groups with or without sexual dysfunction (table IV).

All eleven patients (100%) with S.R.Q. score at or higher

Table I - Self report questionary (SRQ)

Questions	
1.	Do you often have headache?
2.	Do you have lack of appetite?
3.	Do you have trouble to sleep?
4.	Do you get scared easily?
5.	Do you feel your hands shivering?
6.	Do you feel nervous, tense, or worried?
7.	Do you have digestion problems?
8.	Do you have trouble to think clearly?
9.	Have you felt sad lately?
10.	Have you cried more than usual?
11.	Have you faced difficulties in carrying out your daily activities with satisfaction?
12.	Do you find it difficult to take decisions?
13.	Do you have difficulties in your work?
14.	Are you unable to play a useful role in your life?
15.	Have you lost interest in things?
16.	Do you feel useless, not diligent?
17.	Have you thought about taking your life?
18.	Do you feel tired all the time?
19.	Have you had unpleasant feelings in your stomach?
20.	Do you get tired easily?

Table II - Reasons to be excluded from the study

Reason	Men-number (%)	Women- number (%)
Age at or older than 75	12 (27.3)	11 (37.9)
No informed consent	6 (13.6)	0
Death	4 (9.1)	4 (13.8)
Residence in another state	1 (2.3)	0
Previous AMI	1 (2.3)	0
Not sexually active	4 (9.1)	12 (41.4)
Previous sexual dysfunction	13 (29.5)	2 (6.9)
No-return	3 (6.8)	0
Sub-total	44 (100)	29 (100)
Total	73	

Table III - Reference clinical characteristics among groups with and without post-myocardial sexual dysfunction

	With dysfunction 26 patients	Without dysfunction 17 patients	
Variable	Number (%)	Number (%)	p
Previous AMI	9 (34.6)	4 (23.5)	0.5
Lateral AMI	3 (11.5)	1 (5.9)	1
Inferior AMI	14 (53.8)	12 (70.6)	0.3
AMI with upper unlevelling of the ST segment	21 (80.8)	16 (94.1)	0.3
AMI no upper unlevelling of the ST segment	5 (19.2)	1 (5.9)	0.4
Thrombolytic	11 (42.3)	7 (41.2)	1
Intra-coronary stent	12 (46.1)	8 (47.1)	1
Myocardial revascularization	3 (11.5)	2 (11.8)	1
CHF FC II (NYHA)*	6 (23.1)	1 (5.9)	0.3
Symptoms during intercourse	6 (23.1)	2 (11.8)	0.4
Sexual activity quality standard: normal. good. or excellent. before AMI	23 (88.5)	17 (100)	0.2
Average number of intercourses (a month) before AMI**	8±3.4	8±7.2	0.4

* Congestive Heart Failure Functional Class following the New York Heart Association (CHF FC NYHA); ** Analysis based on Mann-Whitney test.

Table IV - Variables analyzed among groups with and without post-myocardial sexual dysfunction

	With dysfunction	Without dysfunction	
Variable	Number (%)	Number (%)	P
Diabetes	6 (23.1)	0 (0)	0.07
Dyslipidemia	20 (76.9)	11(64.7)	1
Smoking	14 (53.8)	14 (82.3)	0.1
Systemic Arterial Hypertension	13 (50)	4 (23.5)	0.1
Angiotensin-converting Enzyme (ACE) Inhibitors	15 (57.7)	7 (41.2)	1
Beta-blockers	18 (69.2)	17 (82.3)	0.5
Estatins	13 (50)	6 (35.3)	0.4
Clopidogrel	3 (11.5)	0 (0)	0.3
Ticlopidine	2 (7.7)	3 (17.6)	0.4
Furosemide	1 (3.8)	1 (5.9)	1
Fear of cardiac complications	14 (53.8)	10 (58.8)	1

than seven - thus indicating the presence of psychological disorders - reported sexual dysfunction at study closing. Among the thirty-two patients reporting scores lower than seven, fifteen (46.9%) also reported sexual disorder. Therefore, patients with score at or higher than seven were shown to report higher sexual dysfunction level than those with a score lower than seven (p=0.001).

The group reporting sexual dysfunction was significantly older as compared to the group that did not report sexual dysfunction: 53±8.9 years of age versus 47±8.7 years of age (p=0.04).

Discussion

For over 40 years literature has shown evidence of the negative impact of AMI on sexual activity[33]. As far as the authors are aware of, this is the first study to show the unfavorable impact of AMI on sexual function of Brazilian patients. Although having resumed their sexual life on month 1 after the event, a 40% reduction was reported for sexual intercourses if compared to pre-infarction period. Nine percent of patients never resumed their sexual activity. Literature describes that sexual activity is resumed between 36 and 90 days, in average, after hospital discharge[7,9]. Five percent to thirty-five percent of patients do not resume their sexual activity[34-36], 35% to 70% significantly reduce their intercourse frequency, and between 25% and 39% report reduction in their satisfaction from sexual activity[10,37,38]. However, literature has not yet clearly defined the variables associated to postmyocardial infarction sexual dysfunction in patients not reporting previous dysfunction. The present study succeeded in identifying age and psychological disorders (anxiety and/or depression) as variables associated to post-AMI sexual dysfunction.

Hellerstain & Friedman also demonstrated that sexual activity is reduced with age, and even more so for post-AMI patients[12]. Similarly to what has been shown for men, women also report lower sexual desire with age[39]. Papadoupolos and collaborators have reported that female patients' age - as well as sexual activity prior to AMI seemed to be related to its being resumed[7]. Drory and collaborators found that age was inversely related to sexual activity frequency and satisfaction more relevantly than any other medical or psychological variable under study[34]. Having all those aspects in mind, age might be a facilitator and a precipitator of sexual disorders, whether by the way sexual activity is valued, due to its interaction with other factors - such as co-morbidities or psychological components - or as a result of eroticism reduction from ageing[40].

Anxiety may reduce the erotic focus, and as a consequence, reduce psychogenic stimulus. Therefore, it interferes in the normal sexual cycle, thus impairing man's erection and women's lubrication. Additionally, brain signals may also inhibit parasympathic activation or exacerbate sympathic response, thus interfering in the normal cycle for both men and women[41]. The fear of cardiac complications - both on the part of the male patient or his female companion - result in anxiety, anger, and even regression[42,43]. Such feelings are not only frequent, but may linger until some appropriate intervention is carried out. Mayou and collaborators reported that over 70% of patients had tension and anxiety symptoms at early stages, and they could linger on up to one year after AMI[44]. The fear of failure in sex is directly associated to anxiety. Psychodinamically, that is explained by repeated fear of rejection - that is renewed at every sexual confrontation. By defocusing erotic pleasure, self-prevention of enjoying sexual intercourse will turn individuals into expectators of their performance, with no surrendering[40]. The fear of the cardiologic consequences in active sex, as well as the anxiety associated to the ability of being able to keep a sexually attractive and functional sexual life, may lead to an anxious "performance" - one of the ultimate causes of sexual difficulties faced both by men and women[45]. A very important, additional psychological factor is the frequent occurrence of depression. Even if no cardiopathy condition is present, it is a relevant cause for sexual dysfunction[46]. Depressive individuals exhibit hyperactivity of autonomous nervous system and decreased psychogenic stimulus, which results in the reduction of desire. All patients who presented a score at or higher than seven in their SRQ - an indicator of anxiety and/or depression - reported sexual dysfunction.

Classic risk factors for coronary atherosclerosis are related to higher prevalence of erectile dysfunction[3]. However, such variables are not correlated to higher incidence of sexual dysfunction in our study. Most likely due to the fact that patients reporting such factors - and with previous sexual dysfunction - were excluded from the protocol very early on. Additionally, six months is quite a short period for the clinical manifestation of the vascular and neurogenic injuries that are responsible for erectile dysfunction.

No statistically significant difference was reported in regard to the use of drugs, beta-blockers included, among patients with or without sexual dysfunction. Despite all controversy associated to the topic, especially resulting from preconceptions and personal experience, our findings are grounded on quite an extensive double-blind, randomized, placebo-controlled study that demonstrated that beta-blockers report the same incidence of erectile dysfunction as placebo does after four years of study follow-up[48]. It has recently been demonstrated that the incidence of erectile dysfunction in coronary patients on atenolol increases following treatment awareness and the possibility of side effects. In this randomized study, erectile dysfunction incidence was 3% among those who were not aware of the drug name, 16% among those who were aware they were being given atenolol, and 31% of patients who were also informed on the possibility of side effects (erectile dysfunction) (p<0.001)[49]. Later on, improvement of erectile dysfunction in the group was similar to those randomically treated with sildenafil or placebo. Therefore, the association with beta-blockers was excluded, and the possibility of a psychological component in erectile dysfunction was denoted.

A minor casuistry was reported in female patients, probably

because they were a minority in the sample (30%), and due to the higher number of exclusions: for being over 75 years of age (37.9%); for being sexually inactive (41.4%); or due to higher death rate (13.8%). Which means to say that only 17% of the female could be included in the protocol.Similarly, literature evidences that coronary heart disease usually affects women at a later age range as compared to men, thus resulting in higher morbimortality[50]. Women are a minority in studies involving infarcted patients, and stand for one third of the sample[51]; 79% of them are sexually inactive[37], and 50% of them report sexual arousal disorder prior to AMI[52].

Patients reported significant reduction of sexual activity frequency and high incidence of SD after acute myocardial infarction (AMI). PD and older age were shown to be associated to higher incidence of post-myocardial SD.

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