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Letters

Sexual Activity Patterns Before Myocardial Infarction and Risk of Subsequent Cardiovascular Adverse Events

Sexual activity (SA) is an important component of quality of life, but a matter of concern for many patients after myocardial infarction (MI) and their partners (1). However, although SA may be a trigger of MI in few cases (2), data on potential harms and benefits of SA in patients with coronary heart disease (CHD) are scarce. Lack of data, however, limits the communication of physicians with patients. The aim of this analysis was to investigate whether frequency of SA during the 12 months before an MI is associated with risk of subsequent adverse cardiovascular disease (CVD) events.

We conducted a prospective cohort study in CHD patients 30 to 70 years of age undergoing an inpatient rehabilitation program after an incident MI due to CHD (details of overall CHD cohort in Koenig et al. [3]). SA frequency (including masturbation) during the 12-months before the MI was evaluated by means of a standardized questionnaire. A Cox proportional hazards model was used to estimate the association of frequency of SA with subsequent adverse CVD events (nonfatal and fatal MI, stroke, cardiovascular death) during the 10-year follow-up after adjustment for age, sex, education, rehabilitation program, smoking status, history of diabetes mellitus, left ventricular function, and high-density lipoprotein cholesterol. In addition, adjustment for self-reported physical activity and N-terminal pro-B-type natriuretic peptide was performed. All participants gave written informed consent. The respective ethics boards approved the study.

The mean ± SD age of the included 536 patients with an incident MI was 57.1 ± 8.6 years at baseline, and 85.8% were men. As shown in **Table 1**, self-reported SA in the 12 months before the MI was none (n = 80, 14.9%), less than once per month (n = 25, 4.7%) (both combined in 1 category), less than once per week (n = 136, 25.4%), and 1 or more times per week (n = 295, 55.0%). Sexually more active patients were on average younger, more often men, and less often had diabetes and a less severe CHD. In addition, they were also more often physically active during leisure time compared with others. During the 10-year follow up (median, 9.97 years), 100 adverse CVD events occurred (overall, 23.9 events per 1,000 patient-years).

When compared with patients who were sexually active less than once per week (reference group), patients with at least 1 SA per week had a hazard ratio of 0.49 (95% confidence interval: 0.31 to 0.77) after adjustment for multiple covariates. Adding leisure time physical activity in the year before the MI and N-terminal pro-B-type natriuretic peptide levels to this model only marginally changed the results.

To explore whether SA might be a relevant trigger of MI, we also evaluated the timing of the last SA before occurrence of the MI at baseline (information available for 438 of 536 patients [82%]). Only 3 patients (0.7%) reported SA within the last hour before MI, 0 patients within 1 to 2 h before, and 1.5% in the 3 to 6 h before. The vast majority of patients (78.1%) reported the last SA >24 h before the MI. Therefore, it seems very unlikely that SA is a relevant trigger of MI in this population. Although we have no information about SA patterns after the rehabilitation phase post-MI in our patient population, another study indicated that the percentage of sexually active patients 1 year after MI only slightly decreased from 74% to 68% in men and from 44% to 40% in women compared with pre-MI (4). Given this relatively small decrease and the fact that we found no increased risk associated with SA for adverse CVD events, it is important to reassure patients that they need not to be worried about SA and should resume their usual SA. This information should be reassuring to both affected patients and their partners. In a study from the United States, only one-third of women and 47% of men received information about SA at discharge (4).

SA generally involves moderate physical activity, comparable to 3 to 4 metabolic equivalents (METS) for a relatively short time (1) and thus is comparable to climbing 2 staircases or taking a brisk walk. Therefore, if an exercise testing with ≥3 to 5 METS reveals no

TABLE 1 Sexual Activity Before MI and Association With Fatal and Nonfatal CVD Events During Follow-Up

	Sexual Activity Past 12 Months Before Baseline MI			
	None (n = 80)	Less Than Once per Month (n = 25)	Less Than Once per Week (n = 136)	Once or More per Week (n = 295)
Age, yrs	62.3 ± 6.6		59.1 ± 7.0	54.3 ± 8.9
Men	65 (61.9)		123 (90.4)	272 (92.2)
History of diabetes	24 (22.9)		18 (13.2)	40 (13.6)
Clinical score				
1-vessel disease	29 (27.6)		40 (29.4)	121 (41.0)
2-vessel disease	28 (26.7)		33 (24.3)	94 (31.9)
3-vessel disease	37 (35.2)		46 (33.8)	60 (20.3)
Unknown	10 (9.5)		13 (9.6)	12 (4.1)
Physical activity past 12 months before MI				
At least once per week	58 (55.2)		97 (71.3)	216 (73.7)
Less than once per week	6 (5.7)		19 (14.0)	33 (11.3)
Less than once per month	2 (1.9)		5 (3.7)	14 (4.8)
Never	39 (37.1)		15 (11.0)	30 (10.2)
Length of follow-up, yrs*	8.40 (4.70-10.1)		9.77 (4.48-10.0)	9.99 (7.29-10.1)
No. of CVD events	22		38	40
Rate of events/1,000 patient-yrs	29.1		37.7	16.6
Cox proportional hazards model, risk of adverse CVD events associated with sexual activity				
Model 1†	0.82 (0.47-1.41)		1 (ref)	0.50 (0.31-0.78)
Model 2‡	0.74 (0.43-1.29)		1 (ref)	0.49 (0.31-0.77)
Model 3§	0.64 (0.36-1.14)		1 (ref)	0.47 (0.29-0.76)

Values are mean ± SD, n (%), or hazard ratio (95% confidence interval), unless otherwise indicated. *Median (interquartile range). †Model 1 adjusted for age and sex. ‡Model 2 adjusted for age, sex, education, rehabilitation clinic, smoking status, history of diabetes mellitus, left ventricular function, and high-density lipoprotein cholesterol. §Model 3 adjusted for covariates of Model 2, physical activity, and N-terminal pro-B-type natriuretic peptide (log-transformed).

CVD = cardiovascular disease; MI = myocardial infarction; ref = reference.

signs of ischemia or arrhythmia, there does not seem to be a relevant risk for the patient associated with SA. The fact that only 0.7% of our patients reported SA during the critical time window within 2 h before MI is in line with observations that SA might eventually trigger an MI only in a very small proportion of patients (2). However, despite some potential for overestimation due to reverse causation bias, our data still indicate that the benefits of SA outbalance the relatively small risk, especially because very few patients at risk could be easily identified by physical examination and stress testing. Nevertheless, the potential of side effects of various cardiovascular protective medications (erectile dysfunction due to beta-blockers and diuretics) and the undesired effects of the combination of nitrates with phosphodiesterase-5 inhibitors (blood pressure drop) should also be clearly communicated to patients (5).

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