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Sexual activity after myocardial infarction

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Questionnaires on sexual activity were completed by 161 patients attending an exercise-centred rehabilitation program an average of some 3 years after a myocardial infarction. In almost half the group, sexual activity was unchanged or increased compared with the period before the infarction. In the remainder it was reduced; this group included 29 men who had adopted a more passive sexual role and 26 who were now having angina or ventricular premature beats during intercourse. Although the patients with diminished activity could not be distinguished by means of formal personality tests, questionnaires completed by their wives suggested that they were less willing to assume responsibility, had increased difficulty in adjusting to life at home and at work and were more neurotic and depressed than those with normal or increased activity. Furthermore, those with decreased sexual activity had a poorer response to training in terms of attendance, final average jogging distance and gains in physiologic status. Since the frequency of angina and ventricular premature beats was less during intercourse than during standard laboratory exercise, it was concluded that normal sexual relations carry no special risk for the average postcoronary patient; indeed, by enhancing self-esteem and encouraging effective participation in an exercise program, acceptance of normal sexual activity may improve the prognosis.

Un questionnaire destiné à mesurer l'activité sexuelle a été rempli presque 3 ans en moyenne après un infarctus du myocarde par 161 patients participant à un programme de réhabilitation reposant sur l'exercice physique. Pour presque la moitié du groupe, l'activité sexuelle s'est trouvée inchangée ou augmentée par rapport à la période qui a précédé l'infarctus. Pour les autres elle était diminuée; ce groupe comprend 29 hommes qui ont adopté un rôle sexuel plus passif, et 26 autres qui souffraient depuis d'angine ou d'extrasystoles ventriculaires durant les relations sexuelles. Bien que les patients présentant une activité sexuelle diminuée n'aient pu être identifiés par un test spécifique d'évaluation de la personnalité, un questionnaire rempli par leurs épouses indique qu'ils étaient moins disposés à reprendre leurs responsabilités, qu'ils avaient plus de difficultés à s'adapter à leur vie familiale et au travail, et qu'ils étaient plus névrotiques et déprimés que les patients ayant une activité normale ou augmentée. De plus, les patients ayant une activité sexuelle diminuée ont moins bien réagi à l'exercice physique, tant du point de vue de la participation, que de la distance finale de marche et de l'amélioration de l'état physiologique. Comme la fréquence des crises angineuses et des extrasystoles ventriculaires était moindre pendant les relations sexuelles que durant les exercices habituels de laboratoire, on conclut que les relations sexuelles normales ne présentent pas de risque particulier pour le patient coronarien moyen; en fait, en augmentant l'amour propre du patient et en encourageant une participation effective à un programme d'exercice physique, l'acceptation d'une activité sexuelle normale est en mesure d'améliorer le pronostic.

Despite the publicity that has attended the publication of such books as "Human Sexual Response",[1] relatively little is known about the sexual behaviour of the older person,[2-5] and even less about the potential of the patient who has sustained a myocardial infarction. Recent studies from the Toronto Rehabilitation Centre and elsewhere[6-8] have shown much covert depression in these patients, and it would be a reasonable first assumption that an important factor contributing to adverse changes of mood are the tensions and anxieties created by changed roles, both in the sex act and in other areas of lifestyle. However, an otherwise excellent monograph from the International Society of Cardiology[9] was content to comment delicately, "family relationships may so deteriorate that resumption of normal married life becomes very difficult". Equally, a major textbook on ischemic heart disease[10] made no mention of the problem of sexual activity, and a symposium sponsored by the American College of Cardiology[11] con-

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tained only the brief comment that intercourse is permissible after recovery from the acute episode, but that love play should henceforth be the responsibility of the healthier partner: "In those individuals having angina, nitroglycerin taken prior to the act will often prevent pain during coitus."

In young men the physical demands of sexual activity can be severe, with heart rates of up to 170 beats/min and blood pressures as high as 250/120 mm Hg.[12-14] However, in the long-married postcoronary patient the response is much less dramatic; the peak pulse rate may be as low as 120 beats/min and sustained for only 10 to 15 seconds.[15,16]

The purpose of the study reported below was to review further the sexual status of patients enrolled in an exercise-centred rehabilitation program following myocardial infarction. The relations between resumption of a normal sex life, clinical and psychologic status and responses to the training program were assessed.

Methods

Sexual activity

The importance of obtaining further knowledge about sexual activity following myocardial infarction was explained to patients attending an exercise-centred program of rehabilitation following well documented coronary attacks.[17] The concept of the study was accepted enthusiastically by most of the group, and a total of 161 patients returned confidential, number-coded questionnaires on sexual activity to the medical director for subsequent correlation with their clinical, psychologic and physiologic records.

Clinical data

Records of the acute attack were examined with particular reference to the severity of the infarction (judged from number of days in hospital) and the time since the infarction.

Psychologic data

All patients completed the Taylor Manifest Anxiety Scale,[18] the Maudsley Personality Inventory[19] and the Minnesota Multiphasic Personality Inventory (MMPI)[20] within a few days of the return of the sex questionnaire. The psychologic tests were all administered by the staff psychologist under standard conditions. The wives of the patients were asked to complete an informal questionnaire describing their husbands' moods and attitudes.[21]

Physiologic data

Laboratory measures of fitness included assessments of height, weight, excess weight relative to the modified Society of Actuaries scale,[22] the thickness of eight skinfolds (by Lange calipers: Cambridge Instrument Company), grip strength (by a Stoelting dynamometer), resting pulse rate, maximum oxygen intake as predicted from oxygen consumption and heart rate during a progressive bicycle ergometer test,[17] and responses of the systemic blood pressure (with a standard clinical cuff) and electrocardiogram (32 complexes were averaged electronically[17]) to the ergometer loading.

Response to rehabilitation program

This was assessed from attendance at the weekly supervised activity classes and average weekly jogging distance, as well as from the physiologic data.

Results

Characteristics of sexual activity

Almost half the patients (80 of 161; group A) reported either no change or an increase in their sexual activity after the infarction. In the remaining 81 (group B) sexual activity was reduced compared with the period before the infarction. Most (121 of 161) had made no change in patterns of foreplay or the position adopted during coitus; of the 40 reporting a change 29 (all in group B) had adopted a more passive position and 11 (all in group A), a more active position than before the infarction.

Most patients (135 of 161) found sexual intercourse as enjoyable as before infarction. The 26 exceptions were in group B; 6 were now having ventricular premature beats and 20, angina during coitus. Of the 26, 8 admitted they were fearful that intercourse would provoke another infarction, and the wives of a further 8 had such fears; the remainder were apathetic because of the symptoms that occurred during intercourse. Considering group B as a whole, the reasons given for the diminished frequency of sexual activity were apprehension of the patient (17 of 81), apprehension of the wife (19 of 81), loss of desire (30 of 81) and a combination of these factors (15 of 81).

Clinical characteristics

Group B patients were slightly ($0.05 > P > 0.02$) older than group A patients (52.3 ± 7.8 [mean and standard deviation] v. 49.6 ± 7.3 years). However, the duration of hospital stay (group B, 21.2 ± 9.7 days; group A, 23.4 ± 7.7 days), the time since the acute episode (group B, 35.3 ± 26.2 months; group A, 33.2 ± 20.4 months) and the duration of participation in the training program (group B, 19.9 ± 15.9 months; group A, 21.3 ± 15.5 months) were similar. The systemic blood pressure was also almost identical for the two groups (group B, 134.8 ± 16.0/87.4 ± 10.1 mm Hg; group A, 134.0 ± 19.9/87.0 ± 10.1 mm Hg).

Approximately the same proportion of each group were taking tranquillizers such as chlordiazepoxide or diazepam (group B, 22/81; group A, 20/80); slightly more in group B than in group A were taking β-blocking and other antidysrhythmia agents (group B, 9/81; group A, 6/80) and antihypertensive agents (group B, 10/81; group A, 7/80). An equal number of patients from groups A and B (five in each) were taking vitamin E.

Psychologic data

Both groups had relatively high manifest anxiety scores on the Taylor scale,[18] with no significant difference between the groups (group A, 16.5 ± 8.4; group B, 14.2 ± 7.6). The Maudsley Personality Inventory[19] yielded fairly normal scores for neuroticism (group A, 22.1 ± 9.8; group B, 24.3 ± 8.9), with a tendency towards extraversion (group A, 27.5 ± 8.2; group B, 26.1 ± 7.8); again, there were no significant differences between the groups. The results of the MMPI (five scales) are summarized in Table I; scores for groups A and B were remarkably similar.

The questionnaire completed by 100 wives was more informative. The wives of men in group B more often reported an adverse response of their husband to the infarction, as judged from several criteria (Table II), though the overall difference was not statistically significant because of the sample size.

Physiologic data

Data on body build and muscle strength are summarized in Table III. Patients in whom sexual function had deteriorated were initially significantly lighter (4.9 ± 1.4 kg; $P \sim 0.001$) than those whose sexual function was normal. However, both groups showed an

Table I—Scores on the Minnesota Multiphasic Personality Inventory for patients with normal (group A) and impaired (group B) sexual function following myocardial infarction

Scale	Group; mean score and standard deviation	
	A (n = 80)	B (n = 81)
Depression	21.3 ± 5.1	21.6 ± 5.4
Hypochondriasis	20.5 ± 4.6	22.1 ± 4.0
Hypomania	26.6 ± 4.9	28.0 ± 5.3
Hysteria	13.7 ± 5.2	14.4 ± 4.5
Psychasthenia	25.0 ± 4.8	25.7 ± 6.2

Table II—Wives' appraisals of patients' status following myocardial infarction (data for 100 wives)

Criterion of adverse response	Group; no. (and %) of patients: A (n = 51)	B (n = 49)	Significance of difference
Patient takes less responsibility since infarction	27 (52.9)	39 (79.5)	$X^2 = 1.97$; $0.2 > P > 0.1$
Decrease in living standard from social, domestic and financial viewpoints	20 (39.2)	29 (59.1)	Not significant
Patient depressed			
Before infarct	18 (35.2)	16 (32.6)	Not significant
Now	4 (7.9)	13 (26.2)	$X^2 = 1.55$; $P \sim 0.2$
Patient prone to symptom claiming	14 (27.4)	28 (57.1)	$X^2 = 2.25$; $0.2 > P > 0.1$
Patient feels insecure in his employment	8 (15.6)	19 (38.7)	$X^2 = 1.69$; $P \sim 0.2$

Table III—Body build and muscle strength of the two groups of patients

Variable	Group; mean score and standard deviation: A (n = 80) Initial	Final	Change	B (n = 81) Initial	Final	Change
Body weight (kg)	77.6 ± 9.3	78.2 ± 10.2	+ 0.6 ± 3.4	72.7 ± 8.6	73.5 ± 9.3	+ 0.8 ± 3.8
Excess weight (kg)	8.4 ± 6.5	9.2 ± 7.6	+ 0.8 ± 3.5	4.9 ± 7.2	5.6 ± 8.3	+ 0.7 ± 4.0
Skinfold thickness (mm)	14.9 ± 3.3	14.8 ± 3.3	− 0.1 ± 3.6	13.8 ± 3.4	14.1 ± 4.3	+ 0.3 ± 2.6
Grip strength (kg)						
Right hand	49.9 ± 9.3	50.5 ± 9.1	+ 0.6 ± 6.3	47.2 ± 8.9	48.7 ± 8.1	+ 1.5 ± 6.1
Left hand	47.1 ± 7.7	48.9 ± 6.7	+ 1.8 ± 5.3	45.1 ± 6.6	45.7 ± 5.9	+ 0.6 ± 5.2

increase of body weight over the course of training. Part of the initial difference in weight was related to body fat (groups A and B, 21.9% and 21.1%, respectively), but about two thirds of the difference was related to lean tissue, this being reflected in lower initial handgrip scores for group B. Over the course of training both groups showed a tendency to gain in grip strength. Changes in skinfold thickness were insignificant.

Response to rehabilitation program

The initial exercise response of the two groups was similar (Table IV), but the changes in several measures (resting heart rate, predicted maximum oxygen intake and ST-segment voltages) differed enough to suggest that the response to training was better in group A than in group B.

This impression was confirmed by the finding of differences in the proportions of sessions attended at the rehabilitation centre (89% and 68% for groups A and B, respectively) and in the final average weekly jogging distance (21.0 and 17.4 km for groups A and B, respectively).

Discussion

Limitations of the study

Information on the sexual activity of our patients was limited to the reports furnished by study participants and their wives. However, there is no reason to suppose that deliberately misleading responses were made to our questionnaires since these were returned anonymously. A further check on the accuracy of the patients' questionnaire responses was provided by the lie scale of the Maudsley Personality Inventory; these scores were almost identical for patients reporting normal or increased sexual activity (12.7 ± 5.2) and those reporting diminished sexual activity (12.9 ± 7.1). Finally, there was good concurrence of the information provided by the patients and their wives. Thus we have fair confidence that the information given to us was valid.

Our data do not necessarily apply to all postcoronary patients. Although the rehabilitation program is now well known throughout metropolitan Toronto, we are probably still seeing less than 20% of the survivors of myocardial infarction in this area. Also our patients are predominantly middle-class, and perhaps for this reason most of their sexual activity is occurring within the framework of long-established marriages.

Table IV—Resting pulse rate and exercise responses in the two groups of patients

Variable	Group; mean value and standard deviation: A (n = 80) Initial	Final	Change	B (n = 81) Initial	Final	Change	Significance of difference in change
Resting pulse rate (beats/min)	78.8 ±12.1	71.8 ±10.9	− 7.0 ±14.4	79.1 ±13.0	74.2 ±13.0	− 4.9 ±11.5	Not significant
Predicted maximum oxygen intake							
l/min	1.91 ± 0.62	2.28 ± 0.61	+ 0.37 ± 0.61	1.78 ± 0.56	1.98 ± 0.53	+ 0.20 ± 0.54	$0.1 > P > 0.05$
ml/kg·min	24.6 ± 7.4	29.3 ± 7.6	+ 4.7 ± 7.4	24.1 ± 7.1	26.9 ± 7.0	+ 2.8 ± 7.1	$0.1 > P > 0.05$
ST-segment voltages (mV), fixed pulse rate	− 0.047 ± 0.08	− 0.037 ± 0.10	+ 0.010 ± 0.13	− 0.044 ± 0.16	− 0.067 ± 0.10	− 0.023 ± 0.16	Not significant

Clinical implications

The present data do not support the view that it is invariably necessary to recommend transition to an unfamiliar and physically less demanding sexual position, such as side-lying,[23] following myocardial infarction. Only 29 of the 161 patients studied adopted a more passive position; whether cause or effect, sexual activity declined in all 29.

The proportion with angina during intercourse (12.4%) was substantially less than the proportion with angina during our standard laboratory exercise test (36.0%), in which the terminal pulse rate averages approximately 140 beats/min. The proportion with ventricular premature beats and other types of dysrhythmia (3.7%) was also less during intercourse than during the laboratory exercise (4.6%). From this symptomatic evidence we concur with Friedman and Hellerstein[8,15] that the peak pulse rate of a middle-aged man during normal sexual relations with a familiar partner is unlikely to be much higher than 120 beats/min and that such activity presents even less risk to the postcoronary patient than rhythmic exercise of the large muscles of the body to 75% of aerobic power. Nevertheless, when such symptoms occur, fear on the part of the patient or his partner has a negative impact on the frequency of sexual activity. If such patients are permitted regular physical activity it should be stressed to them that once a pulse rate of 120 beats/min can be tolerated there is no added danger in normal sexual relations.

Perhaps because formal tests of personality reflect trait rather than state, the tests we used did not distinguish groups A and B. However, the appraisals completed by the wives indicated an association between diminished sexual function and other problems such as diminished assumption of responsibility, deterioration in the general quality of life, depression and neuroticism. While it is difficult to distinguish cause and effect, those with diminished sexual activity had a poor response to training, on the basis of attendance, final average jogging distance and physiologic gains over the course of the program. We suspect that self-esteem is important to completion of an exercise program and that the resumption of normal sexual activity is important in generating such esteem.

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