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CASE REPORT

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Sudden Coronary Deaths Associated with Sexual Activity

Reports on sudden cardiac deaths associated with sexual activity have been few and far between. It was thus thought worthwhile to record the following two cases and review the subject.

Case Reports

Case 1

One morning a 64-year-old man was found dead, lying in his car which was parked off the road. He was in a kneeling position in the rear compartment, cold and stiff. His knees were on the floor behind the front passenger seat, his trunk was over the back seat, and his hands were holding onto the backrest. He was clothed, but his fly was open and his penis uncovered. A contraceptive sheath containing semen was lying between his knees. The scene suggested that he had died just after sexual intercourse, and this was later confirmed by his female partner.

At autopsy there was severe narrowing of the left coronary artery by atheroma, one segment being almost completely occluded by recanalized thrombus, and there was also recent hemorrhage into an atheromatous plaque. The left ventricle showed evidence of old ischemic fibrosis.

Case 2

A 56-year-old man with a history of angina pectoris for which he was receiving treatment drove his wife to work one morning and returned home. He did not look ill and there had been nothing extraordinary about his behavior. His wife tried unsuccessfully to contact him by telephone during the day and became worried and went home at 2:30 p.m. She found her husband dead, lying on the bedroom floor. He was naked except for a pair of blue panties belonging to his wife. A chain was wound round his waist and tightly hooked at the back. A string extending from the glans penis was attached to the chain in the midline at the front. Another piece of string encircled and constricted the root of the scrotum. On an adjacent bed was a collection of chains and other items neatly laid out in rows.

An autopsy, no mark of violence or evidence of asphyxia was found. There was a severe degree of myocardial fibrosis associated with marked narrowing by atheroma of both the left and right coronary arteries. The circumflex branch of the left coronary artery was completely

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occluded by fresh thrombus. It seemed reasonable to conclude that the final cardiac insult resulting in the man's death had been precipitated by the strain of his bizarre sexual activity.

Discussion

Magnitude of the Problem

Cases of sudden death occurring during or shortly after sexual activity crop up from time to time, and forensic pathologists are aware of those cases that come under coroners' or medical examiners' jurisdictions. In a series from Japan, Ueno [*1*] found that 0.6% of all sudden deaths were related to sexual intercourse and that in approximately half of those cases cardiac disease was incriminated. Vergano [*2*] reported two cases of sudden coronary deaths, one man dying during coitus and another during precoital foreplay. Felstein [*3*] stated that he had details of two authenticated cases of coital coronary thrombosis. Further, it is known that cardiac complications, including anginal attacks, are not uncommon during sexual intercourse in patients suffering from coronary heart disease [*4,5*]. Earlier, Klumbies and Kleinsorge [*6*] and Masters and Johnson [*7*] had drawn attention to the possible dangers of coitus for a patient with heart disease. More recently, the subject warranted an editorial comment in the *British Medical Journal* [*8*].

Reliable statistics on the extent of the problem are understandably hard to come by, but going through the scanty available literature on the subject one can conclude that nonfatal complications associated with sexual activity are probably relatively frequent but that the recorded fatalities are few.

Circumstances

Almost all the sexually associated deaths of patients with heart disease reported in the literature occurred under "abnormal" circumstances. For instance, in Case 1 the man was married, his wife was still alive, they had an adult son, and the act took place in the back of a car, while in Case 2 the scene was one of secretive sexual perversion. In the two cases cited by Vergano [*2*] the acts were performed in prostitutes' apartments in the afternoon, and both cases reported by Felstein [*3*] occurred in extramarital situations. Ueno [*1*] stated that four out of five cases of coital coronary deaths happened outside wedlock. Carruthers [*9*], referring to opinions voiced by many general practitioners, noted that a relatively large proportion of nonfatal coronary attacks occurred during extramarital sex affairs, on occasion with a true "femme fatale." Felstein [*3*] writes graphically about the doctor summoned to a "call-girl's" apartment or to a hotel room as an emergency. The doctor arrives to find the caller either a prostitute or an unpaid adulteress—wringing her hands and pointing to a male partner in bed. The man is either holding his chest and in severe pain or is dead.

These reports should not be taken as an indication that such cases do not occur with sexual activity under "normal" conditions. It is more likely a reflection of the fact that the reported cases are those that make headlines and involve medicolegal investigation. When such cases occur in married partners in the privacy of their own bedrooms, it is unlikely that the full circumstances would come to light even if the case history were not distorted and the scene not tampered with by the family.

Another feature of these cases is their predominant occurrence in males. This is most likely related to the more active physical role usually played by the man in the sex act. Bartlett [*10*] found by simultaneously recording the heart rate in both partners in coitus that the male response was generally greater and more uniform than that of the female. Another possible factor is that atheroma is not found in any significant amount in women before the menopause.

It is also noteworthy that all the reported cases occurred in early or late middle-aged per-

sons with evidence of preexisting heart disease, confirmed either clinically or at autopsy. As far as this author is aware, no instances have been recorded of similar fatal or nonfatal attacks in young healthy individuals.

Mechanism

It is not difficult to comprehend why sexual activity might have such adverse effects on the cardiovascular system. Two factors are involved: physical exertion and emotional stress.

The relation of attacks of coronary insufficiency to episodes of physical activity has been recognized for a long time and the familiar term "angina of effort" symbolizes this. The bodily response to exercise is complex and involves, among other effects, an increase in heart rate and a rise in blood pressure [*11*].

According to Kavanagh and Shephard [*12*], physical exercise could precipitate myocardial infarction in an individual who had diseased coronary arteries, the danger increasing progressively with the age of the individual and the presence of other stress factors. Adelson [*13*] stated that in 5% of all cases of sudden heart deaths the deceased was engaged in some strenuous exercise at the time. Spain and Bradess [*14*] found, in a series of sudden coronary deaths, that in 14% of those resulting from thrombotic lesions, the attack was preceded by unusual physical activity. It should be stressed, however, that exercise is not known to cause sudden deaths in healthy hearts; according to Jokl and McClellan [*15*], careful autopsy examination in these circumstances always reveals an underlying cardiac pathology, whether of congenital, infective, or degenerative nature.

The relationship of coronary attacks to emotional stress has, however, not been seriously considered until recently, even though Harvey [*16*] seemed to have recognized this connection as early as 1628 when he is quoted to have said, "My life is at the mercy of any fool who shall put me in a passion," and even despite the fact that the layman has always linked emotions, particularly those of love and hate, to the heart. The emotional approach to heart disease has centered on two types of studies: (1) epidemiological, where clinicians have related their patients' heart illnesses to emotional factors at home or work [*9,12,17,18*] and pathologists have related case histories of emotional stress precipitating death [*6,19*], and (2) scientific laboratory investigations, as a result of which various mechanisms—hemodynamic, neurobiochemical, metabolic, and electrophysical—have been advanced to explain the possible adverse effects of emotional stress on cardiac function. These have been reviewed in detail [*9,19*]. Recently, emotion has been measured quantitatively in terms of the two hormones adrenaline and noradrenaline released as a result of stress [*20*]. Rahe et al [*21*] have found that the degree of stress to which individuals are subjected in their daily lives corresponds not only to the levels of stress hormones excreted in their urines but also to their liability to develop coronary thrombosis.

The interplay of physical and emotional factors in coronary episodes was emphasized by Kavanagh and Shephard [*12*], who reported that the immediate factor triggering the attack in about one third of a group of 102 coronary patients seems to have been some intense and unaccustomed exercise, sometimes associated with excitement, and in a proportion of the remainder there was a well-defined emotional shock.

Human volunteers have been employed to record the cardiovascular responses to sexual intercourse by several workers [*4,5,7,10,22*]. Their findings were, on the whole, similar and indicated that sexual activity could have multiple effects, including rises in heart and respiratory rates and increases in blood pressure. Heart rates of up to 180 per minute [*10*] and blood pressures of 31/17 kPa (230/130 mm Hg) [*5*] have been recorded at orgasm. However, no significant electrocardiographic changes have been observed in normal individuals during coitus [*5,22*].

Both the physical and emotional components of sexual activity help to explain why heart attacks are more likely to occur in extramarital affairs under "abnormal" circumstances, because under such conditions both these components naturally tend to be exaggerated.

What Advice to Give to Partners?

The question thus arises, "Should there be any restriction of sexual activity in normal healthy persons and individuals with diseased hearts?" For healthy persons the consensus of opinion is that normal sexual activity is to be regarded as a form of pleasant, judicious, regular exercise and as such should have a beneficial effect on cardiac function. However, even so, the argument still stands whether the cumulative effects of such an activity, involving both physical and emotional stresses, would not eventually strain the heart. A recent report of the Joint Working Party of the Royal College of Physicians of London and the British Cardiac Society on the prevention of coronary heart disease [*23*] concluded that (1) physical activity should be encouraged at all ages and in both sexes, and few people need to consult their doctors before making a graded increase in such activity; and (2) while acute stress may occasionally precipitate a heart attack, it is difficult to prove that chronic stress contributes to the development of coronary heart disease.

Whatever the answers might turn out to be, "moderation" would seem to be logical advice. For individuals with diseased hearts it is observed that sexual activity declines with age and more so in people with heart disease, a natural reaction to the fear of developing cardiac symptoms, particularly the crippling anginal pain. It is generally agreed that after a heart attack, rest, including abstinence from sexual activity, is indicated for a period of one or two months. Later, the doctor should counsel the patient, and preferably his partner as well (at times one or other of the couple might volunteer to raise the matter with the doctor), explaining the situation without being unduly alarming and advising them to adjust to a more "reasonable" sexual life. According to Nemec et al [*22*], "Counselling the cardiac patient, especially following myocardial infarction, as to types and extent of physical activity, should include specific advice regarding sexual intercourse."

Kavanagh and Shephard [*12*] noted that while both bed and normal place of work were unusual venues for a heart attack, undue strain could precipitate one; consequently, they advocated the institution of a safe physical and emotional regimen for the coronary-prone patient. Felstein [*3*], taking into consideration the circumstance under which these mishaps usually occurred, advised that the anginal patient should avoid vigorous variations on his usual sexual patterns and that such a patient was safer with his or her regular sexual partner than with a new one who might alter the pattern and level of sexual activity. Resort to other forms of exercise to improve the heart performance and perhaps the use of anti-stress drugs (β-adrenergic blocking agents) may have to be considered [*24*]. No hard and fast rule can be laid down, and each case has to be considered on its own merits.

Finally, it is hoped that this communication might stimulate others to publish any similar cases they have dealt with so that more information is available on the extent and circumstances of this problem. This would, in turn, be of much use to those engaged in preventive cardiology.

Summary

Two cases of sudden coronary deaths occurring in circumstances of unusual sexual activity are reported. Previous recorded cases are reviewed and the subject is discussed as regards the magnitude of the problem, its circumstances, the mechanisms involved, and the preventive measures to be adopted.

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