Circulation

RESEARCH LETTER

Sudden Cardiovascular Arrest During Sexual Intercourse

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Considerable apprehension often surrounds the issue of sudden cardiovascular arrest (SCA) during physical activity, especially that related to sexual intercourse. Sex-related SCA (SxSCA) has been mainly investigated through forensic studies, and epidemiological data are scarce.[1] A comparison of the characteristics and outcomes of SxSCA with other SCAs may allow a better understanding of this dramatic condition.

The Paris-SDEC registry (Paris-Sudden Death Expertise Center) has been described previously.[2] In brief, it is an ongoing, prospective, population-based study in Paris and its suburbs (population 6.7 million). Since May 2011, every case of out-of-hospital SCA aged ≥18 years has been captured, and systematic information has been gathered. Appropriate institutional review boards approved the investigation with waiver of informed consent. Utstein templates and medical records were reviewed by 2 cardiologists. Data from all patients with SCA alive at hospital admission were analyzed. SxSCA was defined as any SCA occurring during coitus or within the following hour, and its characteristics were compared with SCA occurring during other physical activities (exercise-non SxSCA), and at rest (sedentary), as well. All patients admitted alive with a normal coronary angiogram and clinical evidence for a neurological issue systematically underwent a computed tomographic scan examination. Continuous data were expressed as mean. Categorical data were expressed as frequencies (percentages). We compared characteristics of SxSCA with exercise-non SxSCA and with sedentary SCA, overall. All analyses were 2-sided. Statistical analyses were performed by using R 3.4.2.

From May 2011 to May 2016, 3028 patients with SCA were admitted alive. Overall, 17 (0.6%) patients had SxSCA, 229 (7.6%) had SCAs that occurred during physical activities other than sexual intercourse (138 during sports activities and 91 during moderate- to vigorous-intensity nonsport activities), and 2782 had SCAs that occurred at rest. In comparison with both exercise-non SxSCAs and SCAs at rest, patients with SxSCAs were more likely to be male (100% versus 88.2% versus 71.6%, respectively, $P<0.001$), younger (53.0 versus 56.2 versus 59.5 years, $P<0.001$), with a similar cardiovascular risk profile (≥1 factor, 81.2% versus 75.6% versus 81.5%, $P=0.10$), and a smaller prevalence of warning symptoms (37.5% versus 53.6% versus 71.4%, $P<0.001$). It is noteworthy that none of those with subarachnoid hemorrhages presented with neurological symptoms before SCA. Despite a high proportion of witnessed events (100% versus 95.6% versus 90.6%, $P<0.001$), patients with SxSCAs presented with higher delays from collapse to cardiopulmonary resuscitation (CPR; median, 5.0 versus 2.0 versus 4.0 minutes, $P<0.001$), lower bystander CPR (47.1% versus 80.3% versus 62.6%, $P<0.001$), less initial shockable rhythm (41.2% versus 72.5% versus 50.7%, $P<0.001$), and lower survival rate at hospital discharge (11.8% versus 50.2% versus 24.9%, $P<0.001$). The main etiologies of SxSCA were acute coronary syndrome (37.5%)

Key Words: cardiopulmonary resuscitation ■ death, sudden ■ education ■ sexual behavior ■ survival

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and subarachnoid hemorrhage (31.3%), and, to a lesser extent, chronic coronary artery disease (18.8%) and structural nonischemic heart disease (12.5%). Among cases of exercise-non SxSCA, the principal etiologies were acute coronary syndrome (59.0%) and chronic coronary artery disease (16.0%), whereas subarachnoid hemorrhage accounted for <3% (Figure).

To the best of our knowledge, our study is the first to show a high preponderance of subarachnoid hemorrhage in SxSCA in the general population. The paradox of physical activity is well known, with regular activity being beneficial for health, but with a small incremental risk of SCA during acute strenuous exertion. SxSCA is a rare event overall, occurring typically among middle-aged men with cardiovascular risk.[3,4] Unadjusted survival and bystander CPR rates were lower among SxSCA cases, in line with the recent findings from the Oregon-SUDS study (Oregon Sudden Unexpected Death Study) that similarly highlighted the need for better public education for improving CPR rates by the sex partner.[1]

Cardiovascular effects during coitus have been studied by monitoring volunteers. Hemodynamic changes, including increased heart rate, respiratory rate, and blood pressure, have been identified, especially during orgasm. The increased cerebral perfusion pressure when intracranial pressure decreases abruptly during orgasm results in maximal wall tension in cerebral aneurysms, which could explain the higher proportion of subarachnoid hemorrhage.[5] Moreover, headache attributable to cerebral vasospasm has been described during coitus, and a similar phenomenon may occur in the coronary circulation. One of the limitations of this study is that SxSCA may be potentially underreported because of social embarrassment, and this precludes any incidence calculation. Also, we have focused on survivors to hospital admission to provide a complete picture of SxSCA, including details on etiologies.

In summary, SxSCA is rare (<1% of all SCAs), with the typical patient being a middle-aged man with high cardiovascular risk, with a predominance of acute coronary syndrome and subarachnoid hemorrhage as main causes. The extremely low rate of bystander CPR in this setting (where a witness is universal), possibly because of fear and lack of training, likely contributes to the observed almost 5-fold lower survival rate in comparison with other physical activity–related SCA, and gives an opportunity to improve outcomes through better public awareness and education for this particular manifestation of SCA that could be very emotionally traumatic for the partner.

ARTICLE INFORMATION

The online-only Data Supplement is available with this article at http://circ.ahajournals.org/lookup/suppl/doi:10.1161/CIRCULATIONAHA.117.032299/-/DC1.

Data Sharing: The data, analytic methods, and study materials will not be made available to other researchers for purposes of reproducing the results or replicating the procedure.

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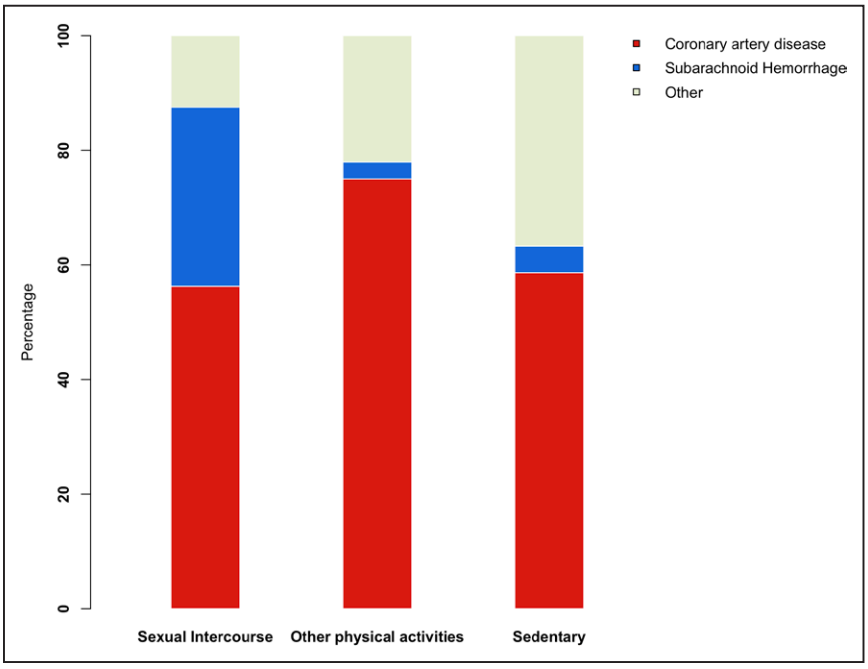

Figure. Etiologies of sudden cardiovascular arrest during sexual intercourse in comparison with sudden cardiovascular arrest occurring during non–sex-related physical activities and at rest.

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Acknowledgments

Paris-Sudden Death Expertise Center 2016 Investigators Listing (see online-only Data Supplement).

Sources of Funding

The Paris-SDEC activities are supported by the Institut National de la Santé et de la Recherche Médicale (INSERM), Assistance Publique–Hôpitaux de Paris, Paris Descartes University, Fondation Coeur et Artères, Global Heart Watch, Fédération Française de Cardiologie, Société Française de Cardiologie, Fondation Recherche Medicale, and unrestricted research grants from industrial partners (Medtronic, St Jude Medical, Boston Scientific, Liva Nova and Biotronik), as well.

Disclosures

None.

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Circulation. 2018;137:1638-1640
doi: 10.1161/CIRCULATIONAHA.117.032299
Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231

Print ISSN: 0009-7322. Online ISSN: 1524-4539

Supplementary file 3. Paris-SDEC Investigators Listing

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