

Love Death—A Retrospective and Prospective Follow-Up Mortality Study Over 45 Years

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ABSTRACT

Background: Although sexual activity can cause moderate stress, it can cause natural death in individuals with pre-existing illness. The aim of this study was to identify additional pre-existing health problems, sexual practices, and potential circumstances that may trigger fatal events.

Methods: This medicolegal postmortem, retrospective, and prospective study is based on data of autopsies performed at the Institute of Legal Medicine of the University hospital, Goethe-University, Frankfurt/Main, Germany.

Outcomes: Identification of pre-existing health problems, sexual practices, and potential circumstances that could trigger fatal events.

Results: From 1972 to 2016 (45 years) approximately 38,000 medicolegal autopsies were performed, of which 99 cases of natural death were connected to sexual activities (0.26%). Except for eight women, men represented most cases. The women's mean age was 45 years (median = 45) and the men's mean age was 57.2 years (median = 57). Causes of death were coronary heart disease (n = 28), myocardial infarction (n = 21) and reinfarction (n = 17), cerebral hemorrhage (n = 12), rupture of aortic aneurysms (n = 8), cardiomyopathy (n = 8), acute heart failure (n = 2), sudden cardiac arrest (n = 1), myocarditis (n = 1), and a combination of post myocardial infarction and cocaine intoxication (n = 1). Most cases showed increased heart weights and body mass indices. Death occurred mainly during the summer and spring and in the home of the deceased. If sexual partners were identified, 34 men died during or after sexual contact with a female prostitute, two cases at least two female prostitutes. Nine men died during or after sexual intercourse with their wife, in seven cases the sexual partner was a mistress, and in four cases the life partner. Five men died during homosexual contacts. Based on the situation 30 men were found in, death occurred during masturbation. Of the women, five died during intercourse with the life partner, two died during intercourse with a lover or friend, and in one case no information was provided.

Clinical Translation: Natural deaths connected with sexual activity appear to be associated with male sex and pre-existing cardiovascular disorders. Most cases recorded occurred with mistresses, prostitutes, or during masturbation. If death occurs, the spouse or life partner might need psychological support.

Strength and Limitations: To our knowledge, the present study contains the largest collection of postmortem data on natural deaths connected with sexual activities. However, the cases presented were of forensic interest; a larger number of undetected cases especially in the marital or stable relationship sector must be assumed.

Conclusion: Patients should be informed about the circumstances that could trigger the "love death." **Lange L, Zedler B, Verhoff MA, Parzeller M. Love Death—A Retrospective and Prospective Follow-Up Mortality Study Over 45 Years. J Sex Med 2017;XX:XXX–XXX.**

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Key Words: Sudden Natural Death; Sexual Activity; Autopsy; Myocardial Infarction; Cerebral Hemorrhage; Circumstances of Death

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INTRODUCTION

Sexuality is generally considered a positive attribute in encouraging human relationships, increasing satisfaction and relaxation, and creating new life. The orgasm is entitled to be the "climax of pleasure." Therefore, the association of sexual activity with physical discomfort and even death can surprise lay people

who do not connect the human sexual act with physical illness or life-threatening conditions.

Cardiovascular and neuroendocrine responses to sexual activity have been examined in numerous clinical studies^{1–9} that have reported on the association of cardiovascular stress in healthy individuals during sexual activity to moderate levels of exertion.⁹ This can be compared with physical stress caused by daily activities, such as riding a bicycle. However, in individuals with pre-existing cardiovascular diseases, sexual activity, like physical activity,¹⁰ can exceed the individual's physical capacity and lead to sudden death as the potentially first manifestation of this disease.

Compared with numerous data on unnatural deaths connected with sexuality,¹¹ the forensic literature on natural deaths during intercourse is relatively sparse. The odds leading to fatal events seem to be rather small. Thus far, in previous studies,^{12–17} cardiovascular diseases followed by cerebral hemorrhage were considered the main cause of death involving predominantly men. However, considering these small numbers of fatal events, from the clinical point of view this topic is very important because of the large number of patients with cardiovascular diseases. Additionally, a satisfying sexual life is usually seen as a main contributor to an individual's life quality. Therefore, the American Heart Association has provided recommendations on how to advise patients with known cardiac diseases about sexual activities, suggesting clinical exercise tests and sexual counseling of the patient and the potential partner.¹⁸

The present study evaluated cases of “love death.” Autopsy data covering a period of 45 years were used to investigate pre-existing diseases, sex differences, sexual practices, and circumstances of natural death that could trigger fatal events connected with the sexual act. The results of this study could lead to further recommendations for clinicians following the principle of *mortui vivos docent*.

METHODS

Autopsies performed at the Institute of Legal Medicine of the University hospital, Goethe-University, Frankfurt/Main, Germany include cases from Frankfurt/Main and the surrounding areas (~1.9 million inhabitants, as updated in September 2015 from regional authorities). An analysis of natural death associated with sexual activity was performed based on legal autopsy data collected from 1972 to 2016, retrospectively until 2000 and from then in a prospective manner.^{19–23} Approximately 38,000 cases were evaluated based on autopsy protocols and, if available, police reports. If the cause of death could not be diagnosed macroscopically during autopsy examination, toxicologic and/or histologic examinations, commissioned by the criminal investigators, were performed.

Cases of “love deaths” (ie, natural death immediately before, during, or shortly after sexual activity) were selected, including any sexual practice with or without a partner, voyeuristic actions, or reading pornographic material. To identify possible predictive

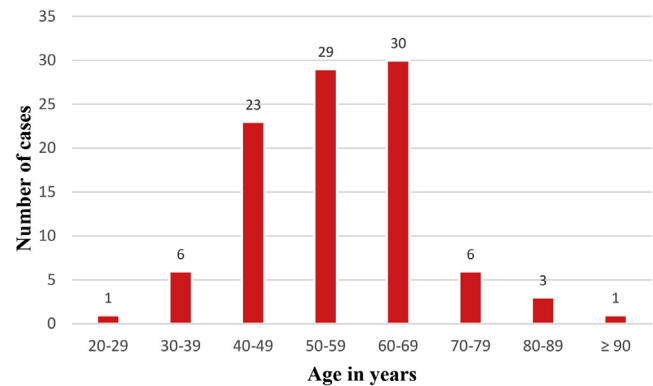


Figure 1. Age distribution of subjects who died of natural causes during sexual activity.

circumstances for fatal events connected with sexual activities, the cases were statistically evaluated using spread sheet applications (Access and Excel; Microsoft, Redmond, WA, USA), including the sex and age of the deceased, cause of death, and, if available, data on body length, weight, and heart weight. Furthermore, the presence of sexual partners, the kind of sexual partners (ie, spouse, mistress or lover, prostitute), the place of death, season, and the possible influence of drugs or alcohol were examined.

Evaluation of the body mass index (BMI) was performed by dividing weight (kilograms) by height (meters) squared. To determine whether an increased heart weight was present, the calculation of predicted postmortem heart weight in Caucasian adults according to age, sex, and BMI as presented by Wingren and Ottosson²⁴ was applied.

To decrease potential sources of bias in the evaluation and selection of cases, the study was performed by a maximum of four examiners during the study.

The ethical standards of autopsies and statistical analysis complied with current laws of the Federal Republic of Germany. Approved permission of the ethics committee at the University Hospital, Goethe-University, Frankfurt/Main, Germany was obtained (number 116/14).

RESULTS

In the present study, 99 cases of natural death connected with sexual activity were identified, representing 0.26% of total autopsies performed. Only eight women were included among these cases. The women's mean age was 45 years (median = 45) and the men's mean age was 57.2 years (median = 57). The youngest person who died in connection with sexual activity was a 22-year-old woman and the oldest was a 92-year-old man. **Figure 1** presents the age distribution.

The following causes of death were identified: coronary artery disease (n = 28), myocardial infarction (n = 21) and reinfarction (n = 17), cerebral hemorrhage (n = 12), ruptured aortic aneurysm (n = 8), cardiomyopathy (n = 8), acute heart failure (n = 2), myocarditis (n = 1), and sudden cardiac death (n = 1).

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