


Spolni odnos i aritmije

Sex and arrhythmias

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SAŽETAK: Iznenađna srčana smrt tijekom spolne aktivnosti rijedak je događaj, no svjedočimo demografskim promjenama u rizičnim skupinama. Nedavna su istraživanja pokazala da srčani događaji tijekom spolne aktivnosti sve više pogađaju mlađe ljude, s većim udjelom smrtnih slučajeva u žena nego što je prethodno zabilježeno. Postoji potreba za dijalogom između kardiovaskularnih (KV) zdravstvenih djelatnika i bolesnika kako bi se pružila potrebna edukacija i informiralo o mogućnosti vođenja sigurnoga spolnog života. Ovaj članak opisuje kako spolna aktivnost može dovesti do povećanog rizika od aritmija i iznenadnoga srčanog zastoja u suboptimalno liječenih ili nedovoljno informiranih bolesnika. Razmotrit ćemo i mogući rizik od aritmija i iznenadne srčane smrti izazvane spolnim odnosom kod najčešćih KV bolesti te sagledati psihosocijalni učinak tog rizika. Zaključno, pružit ćemo i pregled literature o sigurnosti KV lijekova i implantabilnih kardioverterskih defibrilatora. Sveukupno gledano, spolna je aktivnost sigurna za većinu KV bolesnika. Pravilna edukacija može osigurati siguran i opušten spolni život u bolesnika i njihovih partnera, čak i kod KV bolesti s višim rizikom. Iznimno je važno da bolesnik bude adekvatno informiran o čimbenicima koji mogu uzrokovati aritmije i iznenadan srčani zastoj tijekom spolne aktivnosti. Zdravstveni bi djelatnici trebali, gdje je to moguće, razgovarati sa svim svojim bolesnicima i osigurati da seksualni partneri, žene i članovi LGBTQIA+ zajednice imaju jednak pristup savjetovanju prilagođenu njihovim individualnim potrebama.

SUMMARY: Sudden cardiac death during sexual activity is a rare event, but we are witnessing demographic changes in the risk groups. Recent studies have highlighted that cardiac events during sexual activity are affecting younger people, with a higher proportion of female deaths than previously described. Dialogue is needed between cardiovascular staff and patients to provide the necessary education and reassurance about safe sex. This article reviews how sexual activity can lead to an increased risk of cardiac arrhythmias and sudden cardiac arrest in suboptimally treated or underinformed patients. It discusses the possible risks of cardiac arrhythmias and sudden cardiac death induced by sexual intercourse in the most common cardiovascular diseases and also addresses their psychosocial impact. Finally, the literature on the safety of cardiovascular drugs and implantable cardioverter defibrillators is reviewed. Overall, sexual activity is safe for most heart patients, and proper education can ensure a reassuring sex life for the patient and partner even with higher risk cardiovascular disease. It cannot be overemphasized that the patient should be adequately informed about the factors that can cause arrhythmias and sudden cardiac arrest during sexual activity. Health care providers should, where possible, talk to all patients and ensure that sexual partners, female patients and members of the LGBTQIA+ community have the same access to counselling tailored to their individual needs.

KLJUČNE RIJEČI: iznenadna srčana smrt, spolna aktivnost, edukacija bolesnika.

KEYWORDS: sudden cardiac death, sexual activity, patient education.

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Uvod

Iako je to rijetka pojava, još uvijek postoji znatan strah od aritmija i iznenadne srčane smrti (SCD) povezanih sa spolnom aktivnošću. Taj strah nije prisutan samo u osoba s kardiovaskularnim (KV)

Introduction

Although rare, there is still considerable fear of cardiac arrhythmias and sudden cardiac death (SCD) associated with sexual activity. This fear occurs not only in people with cardiovascular

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bolestima nego i u osoba bez znanog KV rizika. Nedavno istraživanje objavljeno u časopisu *JAMA* analiziralo je 6847 slučajeva SCD-a tijekom razdoblja od dvadeset šest godina u Londonu, pri čemu su zabilježeni rijetki slučajevi smrti tijekom spolnog odnosa ili unutar jednog sata (0,2 %). Međutim, rezultati tog istraživanja razlikovali su se od prethodnih zbog niže prosječne dobi u rizičnoj skupini i većeg udjela smrtnih slučajeva u žena¹. Iako je spomenuto istraživanje bilo ohrabrujuće u smislu učestalosti događaja, također je naglasilo demografske i fenotipske promjene u ovoj skupini rizičnih KV bolesnika.

Godine 2012. Američko udruženje za srce (AHA) objavilo je znanstveni članak o spolnoj aktivnosti i KV bolestima². U KV bolesnika rizik od aritmije i SCD-a varira tijekom spolne aktivnosti, no ažuriranje AHA smjernica nije provedeno, a o ovoj se temi malokad raspravlja u stručnim smjernicama^{3,4}.

S obzirom na smanjenje morbiditeta i mortaliteta zbog stalnog povećanja neinstrumentalnih i instrumentalnih mogućnosti liječenja KV bolesti, moramo poboljšati i osviještenost i educiranost bolesnika o utjecaju intervencija na spolnu aktivnost u bolesnika s rizikom od aritmije i SCD-a.

Spolna je aktivnost važna sastavnica života bolesnika te ima velik utjecaj na ukupnu kvalitetu života. Bolesnici s KV bolestima i njihovi partneri često imaju pitanja o spolnoj aktivnosti. Kada na ta pitanja ne dobiju odgovore, mogu se pojaviti depresivnost i anksioznost, što može neizravno pogoršati kliničke ishode. Liječnici imaju dužnost takve bolesnike educirati o seksualnosti s obzirom na njihovu bolest⁵⁻⁷. Bolesnici i njihovi partneri koji nisu primjereno informirani mogu biti zabrinuti oko potencijalno negativnih učinaka spolnog odnosa. Zbog straha da bi spolna aktivnost mogla pogoršati njihovo ili partnerovo zdravstveno stanje, neki bolesnici mogu smanjiti učestalost spolne aktivnosti ili je potpuno prekinuti. U anketi na uzorku od 45 bolesnika sa zatajivanjem srca većina (77 %) nije razgovarala o svojim seksualnim problemima sa zdravstvenim djelatnikom. Brige vezane uz seksualnost uključivale su probleme s erekcijom (74 %), pretjeranu zaštitničku nastojanost prema partneru (63 %), poteškoće s postizanjem orgazma (51 %), manjak interesa za seks (42 %) te strah da bi se partner mogao početi osjećati loše tijekom spolnog odnosa (36 %)⁸.

Pitanje pojavljivanja aritmija i SCD-a tijekom spolnog odnosa u bolesnika i njihovih partnera može biti velik izazov za liječnike. Zdravstvenim je radnicima često neugodno razgovarati s bolesnicima o spolnoj aktivnosti, osobito sa ženama i članovima LGBTQ zajednice. U jednom manjem istraživanju velik udio bolesnica koje su preživjele infarkt miokarda nastavio je sa spolnom aktivnošću a da nisu primile nikakve smjernice od svojih liječnika. Kada je i razgovor o nastavku spolne aktivnosti bio pokrenut s medicinskim osobljem, uglavnom su ga započele same bolesnice⁹.

Patofiziologija aritmija i iznenadne smrti tijekom spolnog odnosa

Aritmije izazvane tijekom spolne aktivnosti uzrokovane su pojačanom simpatičkom aktivacijom i/ili ishemijskom (Slika 1). Povećanje tjelesne aktivnosti dovodi do povećane potražnje miokarda za kisikom. Bolesnici s kanalopatijama i nasljednim kardiomiopatijama imaju povećan rizik od aritmija zbog pojačane simpatičke aktivnosti. Bolesnici s ishemijskom bolešću srca (IBS) imaju pak povećan rizik od aritmije tijekom tjelesne aktivnosti. Patofiziologija načina na koji simpatička aktivnost uzrokuje SCD u osoba s kanalopatijama može biti

disease, but also in people with no known cardiovascular risk. A recent study published in *JAMA* examined 6847 SCD over a twenty-six year period in London, with a rare risk of death during sex or within an hour (0.2%). However, the results of this study differed from previous studies due to a lower mean age at risk and a higher proportion of female deaths¹. Although this study was reassuring in terms of event rate, it highlights demographic and phenotypic changes in cardiovascular patients at risk.

In 2012, the American Heart Association (AHA) published a scientific communication on sexual activity and cardiovascular disease². In cardiovascular patients, the risk of arrhythmia and SCD varies during sexual activity, yet there has been no update of the AHA guidelines and this topic is rarely discussed in professional guidelines^{3,4}.

As our non-instrumental and instrumental treatment options for heart disease continue to expand, morbidity and mortality decline, we need to improve patient awareness and education about the impact of our interventions that affect the sexual activity in patients at risk of arrhythmia and SCD.

Sexual activity is a vital component of a patient's life and has a major impact on overall quality of life. Patients with cardiovascular disease and their partners often have questions about sexual activity. When these questions go unanswered, depression and anxiety can set in, which can indirectly worsen clinical outcomes. Clinicians have a responsibility to provide education about sexuality to patients with various cardiovascular diseases⁵⁻⁷. Patients and their partners who are not adequately informed may have various concerns about the potential negative effects of sexual intercourse. Fearing that it may aggravate their own or their partner's disease, they may reduce the frequency of sexual activity or stop it altogether. A survey of 45 patients with heart failure. The majority (77%) have not discussed their sexual concerns with a health professional. Sexual concerns included problems with erection (74%), overprotection of partner (63%), difficulty having an orgasm (51%), lack of sexual interest (42%) and fear of partner feeling unwell during sex (36%)⁸.

The issue of arrhythmias and SCD during sex in the patient and his or her partner can be a major challenge for clinicians. Healthcare professionals often feel uncomfortable talking to their patients about sexual activity, especially female patients and members of the LGBTQ community. In a small study, a large proportion of female patients who had suffered a heart attack continued to engage in sexual activity without any guidance from their doctors. When the resumption of sexual activity was discussed with care staff, it was predominantly the patients themselves who initiated the conversation⁹.

Pathophysiology of cardiac arrhythmias and sudden death during sex

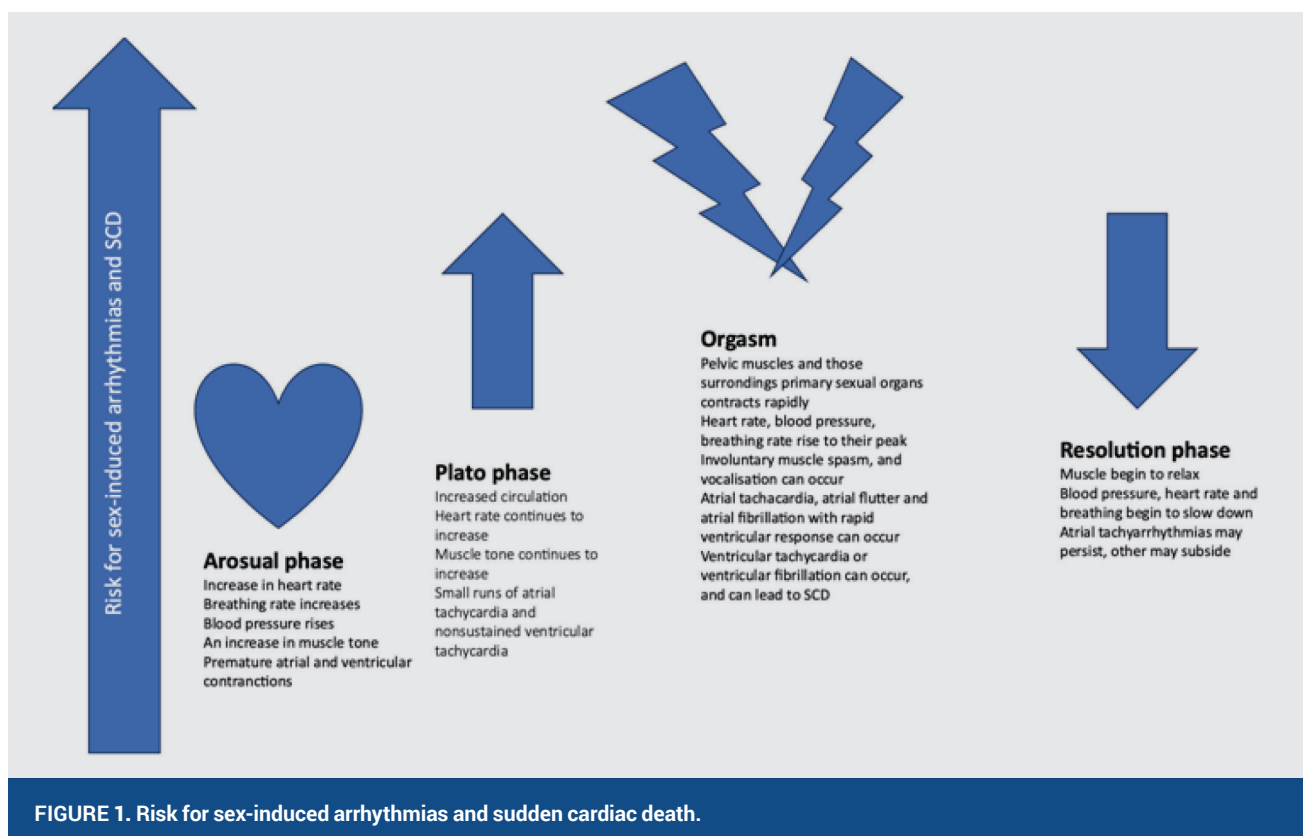
The arrhythmias induced during sexual activity are due to increased sympathetic activation and/or ischemia (Figure 1). An increase in physical activity leads to an increase in myocardial oxygen demand. Patients with channelopathy and hereditary cardiomyopathies are at increased risk of arrhythmias due to increased sympathetic activity. Patients with ischemic heart disease (IHD) are at increased risk of arrhythmia during physical activity. In individuals with channelopathies, the pathophysiology of how sympathetic activity causes SCD varies. In

različite vrste. U bolesnika sa Brugada sindromom (BrS) postoji nekoliko teorija o ulozi koju ima simpatički živčani sustav. U takvih se bolesnika, uz fluktuacije na EKG-u, obično u materijalu endomiokardijalne biopsije mogu pronaći smanjene koncentracije cAMP-a i norepinefrina, što upućuje na to da vagalni tonus srca znatno pridonosi aritmijama u bolesnika s BrS-om¹⁰.

Katekolaminska polimorfna ventrikularna tahikardija (CPVT) pojavljuje se uz polimorfnu ventrikularnu tahikardiju (VT) zbog nasljedne disfunkcije upravljanja kalcijem u sarkoplazmatskom retikulu miokardijalnih stanica kao odgovor na adrenergičku stimulaciju te na tjelesne ili emocionalne stresore¹¹. Nasuprot tomu, skupina kanalopatija povezanih s heterogenim genetskim mutacijama u sindromu dugog QT intervala (LQTS) dovodi do produljenja srčane repolarizacije i QT segmenta na EKG-u, što može uzrokovati ventrikularnu tahikardiju tipa *torsades de pointes* (TdP). Širok raspon događaja može biti „okidač“ za TdP u bolesnika s LQTS-om. Oni s LQT1 i LQT2 fenotipovima najčešće imaju najveći rizik od SCD-a tijekom spolne aktivnosti, a tjelesna aktivnost ili emocionalni stres često su „okidač“¹². Nasljedne kardiomiopatije, poput aritmogene kardiomiopatije desne klijetke (ARVC) i hipertrofične kardiomiopatije (HKM), osim različite fenotipske prezentacije, mogu imati i različite stupnjeve rizika od SCD-a, ovisno o dominantnoj genetskoj mutaciji i progresiji bolesti. ARVC je nasljedna kardiomiopatija koju karakterizira fibrotično-masna infiltracija desne klijetke, ali može zahvatiti i lijevu klijetku¹³. Kako bolest progredira, bolesnici imaju povećan rizik od ventrikularnih aritmija koje mogu dovesti do SCD-a. Takve ventrikularne aritmije često su izazvane tjelesnim naporom i emocionalnim stresom. HKM može imati

patients with Brugada Syndrome (BrS), several theories are known regarding the role of the sympathetic nervous system. In these patients, reduced cAMP and norepinephrine concentrations are usually detected in endomyocardial biopsy material with ECG fluctuations, suggesting that cardiac vagal tone is a significant contributor to the cardiac arrhythmia in patients with BrS¹⁰.

Catecholaminergic polymorphic ventricular tachycardia (CPVT) occurs with polymorphic VT due to an inherited dysfunction of calcium 'handling' in the sarcoplasmic reticulum of myocardial cells in response to adrenergic stimulation, physical or emotional stressors¹¹. In contrast, the group of channel abnormalities associated with heterogeneous genetic mutations in long QT syndrome (LQTS) leads to prolongation of cardiac repolarization, QT segment on ECG, which can lead to sudden Torsades de Pointes (TdP) ventricular tachycardia. In patients with LQTS, a wide variety of events can be triggers for TdP. Patients who are at highest risk of SCD during sexual activity tend to have LQT1 and LQT2 phenotypes, and physical activity or emotional stress is a trigger¹². Inherited cardiomyopathies, such as arrhythmogenic right ventricular cardiomyopathy (ARVC) and hypertrophic cardiomyopathy (HCM), may have different degrees of risk beyond phenotypic presentation to SCD, depending on the dominant genetic mutation and disease progression. ARVC is a hereditary cardiomyopathy characterized by fibrotic-fatty infiltration of the right ventricle, but may also affect the left ventricle¹³. As this disease progresses, patients are at increased risk of ventricular arrhythmias that can lead to SCD. These ventricular arrhythmias are often triggered by physical exertion and emotional stress. HCM may have a similar clinical presentation



sličnu kliničku prezentaciju u smislu ventrikularnih aritmija izazvanih tjelesnom aktivnošću i SCD-om, ali to je rezultat kardiomiopatskih mutacija, pri čemu abnormalnosti u sarkomernim proteinima uzrokuju hipertrofiju lijeve klijetke¹⁴.

Konačno, IBS, bilo da je aterosklerotskoga podrijetla, uzrokovan spazmom koronarnih arterija, *bridgingom* ili abnormalnim polazištem koronarne arterije, može uzrokovati akutnu ishemiju kada postoji povećana metabolička potražnja u srcu zbog tjelesne aktivnosti kao što je spolni odnos, što se često očituje kao angina ili bol u prsima, ali pokatkad i kao ventrikularna fibrilacija ili polimorfna ventrikularna tahikardija.

Spolni odnos – metabolizam

Spolna aktivnost zahtijeva nizak do umjereni stupanj metaboličke aktivnosti (MET), ali čak i blaga tjelesna aktivnost može dovesti do aritmija ili SCD-a u bolesnika s KV bolestima koji pokušavaju postići orgazam, a nisu u dobroj tjelesnoj spremi.

Pri savjetovanju KV bolesnika liječnik bi trebao potvrditi da bolesnik može izvesti 3 – 5 MET-a bez tegoba prije no što započne sa spolnom aktivnošću. Ovaj broj potječe iz istraživanja u kojoj je mjerena potrošnja kisika u 10 zdravih volontera. Istraživanje je uključivalo bračne parove u dobi od 25 do 43 godine koji su sudjelovali u predigri, spolnom odnosu i orgazmu tijekom raznih seksualnih aktivnosti i položaja, uz koitalnu i nekoitalnu stimulaciju od partnera ili uz samostimulaciju¹⁵. Ako liječnik nije siguran u kliničko stanje, može se provesti test opterećenja kako bi se procijenilo može li bolesnik postići tri do pet MET-a bez simptoma ili aritmija. Iako većina bolesnika ne doživi aritmije tijekom spolnog odnosa, u jednom je istraživanju 71 % bolesnika tijekom spolnog odnosa imalo aritmije slične onima koje su zabilježene tijekom testa maksimalnog opterećenja^{15,16}. Ipak, postoji mali rizik od rijetkih smrtonosnih ili hemodinamski značajnih aritmija, pri čemu su ventrikularne ekstrasistole vrste aritmije koje se najčešće pojavljuju tijekom spolne aktivnosti^{15,16}.

Većina bolesnika s KV bolestima može sigurno ulaziti u spolne odnose bez rizika od klinički znatnih aritmija ili SCD-a. Spolna je aktivnost sigurna čak i u bolesnika s poznatom, dobro kontroliranom supraventrikularnom tahikardijom². Iako su aritmije i SCD tijekom spolnog odnosa rijetke, neki bolesnici imaju veću vjerojatnost za pojavu aritmija ili SCD-a tijekom spolnog odnosa. Ove informacije treba bolesnicima i njihovim partnerima prenijeti na umirujući način koji poboljšava sigurnost, ali koji istodobno smanjuje stres. Demografski gledano, smrtonosni aritmični događaj najvjerojatniji je u sredovječnih muškaraca s IBS-om koji ulaze u spolni odnos s mlađim partnerom u izvanbračnoj vezi u njima nepoznatom okruženju^{17,18}. Međutim, savjetovanje o spolnoj aktivnosti ne koristi samo tim bolesnicima. Ishodi i kvaliteta života u bolesnika s prirođenim KV bolestima neprestano se poboljšavaju. Seksualno savjetovanje za bolesnike s kanalopatijama, neishemijskim strukturnim bolestima srca i prirođenim KV sindromima, posebno učinka spolne aktivnosti na smanjenje vjerojatnosti rijetkih KV događaja, osobito je važno kako bi ti bolesnici znali da mogu održati kvalitetu svojeg života i kako bi im se smanjila anksioznost u vezi s planiranjem djece.

Rizik od kardiovaskularnih sindroma tijekom spolnog odnosa

ISHEMIJSKA BOLEST SRCA

in terms of physical activity-induced ventricular arrhythmias and SCD, but this result from cardiomyopathy mutations, with abnormalities in sarcomere proteins causing left ventricular hypertrophy¹⁴.

Lastly, IHD, whether of atherosclerotic origin, coronary artery spasm, myocardial bridging or abnormal coronary artery origin, can all cause acute ischemia when there is an increased metabolic demand on the heart due to physical activity such as sex, often manifesting as angina, chest pain but rarely ventricular fibrillation or polymorphic ventricular tachycardia.

Sexual intercourse – metabolism

Sexual activity requires a low to moderate level of metabolic activity (MET), but even mild physical activity can result in cardiac arrhythmias or SCD in deconditioned patients with cardiovascular disease who attempt to orgasm.

When counselling cardiovascular patients, the clinician should confirm that the patient can perform 3-5 METs without complaints before starting sexual activity. This figure comes from a study in which oxygen consumption was measured in 10 healthy volunteers. The study involved married couples aged 25-43 years who engaged in foreplay, intercourse, and orgasm during various sexual activities and positions with coital and non-coital stimulation by their partner or self-stimulation¹⁵. If the clinician is unsure about the patient, a stress test can be performed to assess whether the patient can achieve three to five METs without symptoms or arrhythmias. Although most patients do not experience arrhythmias during sex, in one study 71% of patients experienced arrhythmias similar to those observed during near maximal exercise testing during sexual intercourse^{15,16}. However, there is a rare risk of lethal or hemodynamically significant arrhythmias, with ventricular extrasystoles being the most common arrhythmias during sexual activity^{15,16}.

Most patients with cardiovascular disease can safely have sex without risk of clinical arrhythmias or SCD. Even in patients with known, well-controlled supraventricular tachycardia, sexual activity is safe². Despite the rare occurrence of cardiac arrhythmias and SCD during sex, some cases have a higher likelihood of arrhythmias or sudden onset of cardiac death during intercourse. This information should be reassuringly communicated to the patient and their partner in a way that improves safety but reduces distress. Demographically, the most likely occurrence of a fatal arrhythmia event is in a middle-aged man with IHD who engages in sexual activity with a younger partner in an extramarital relationship in an unfamiliar setting^{17,18}. However, it is not only these patients who benefit from counselling about sexual activity. The outcomes and quality of life of congenital heart disease patients are improving. Sexual counselling for patients with channelopathies, non-ischemic structural heart disease and congenital cardiovascular syndromes, especially about the effects of sexual activity on reducing the likelihood of a rare cardiac event, in addition to reassuring these patients about their quality of life and reducing anxiety about having children.

Risk of cardiovascular syndromes during sex

ISCHEMIC HEART DISEASE

Arrhythmias associated with IHD include supraventricular arrhythmias (e.g. atrial fibrillation) and SCD due to ventricular

Aritmije povezane s IBS-om uključuju supraventrikularne aritmije (npr. fibrilaciju atrijsa) i SCD zbog ventrikularne tahikardije i ventrikularne fibrilacije. Iako se bolesnicima s IBS-om često savjetuje da je sigurno nastaviti sa spolnom aktivnošću kako bi se spriječili ponovni infarkt i angina, manje se govori o pitanju aritmija i laičke kardiopulmonalne reanimacije (KPR), prije svega s obzirom na partnere takvih bolesnika. Iako je srčana smrt tijekom spolnog odnosa rijetka, u gotovo svim slučajevima u blizini su svjedoci, pa je iznenađujuće da su stope preživljenja nakon SCD-a povezane sa spolnim odnosom gotovo za petinu niže zbog niske stope izvođenja kompresija prsnog koša¹⁸. Educiranje partnera o KPR-u ne samo da može spasiti bolesnikov život već može umanjiti strah i anksioznost povezane sa spolnim odnosom te povećati učestalost spolne aktivnosti. U žena se želja za seksualnom aktivnošću i njezina učestalost smanjuju nakon infarkta miokarda zbog straha od smrti tijekom spolnog odnosa¹⁹.

NEISHEMIJSKA BOLEST SRCA I NASLJEDNI KARDIOVASKULARNI SINDROMI

Aritmije i SCD mogu se pojaviti u bolesnika s neishemijskom strukturnom bolesti srca ili u strukturno normalnim srcima, primjerice u onih s bolešću ionskih kanala i drugim nasljednim KV sindromima. Prikazi slučaja takvih bolesnika navode neishemijske strukturne bolesti srca poput HKM-a, ARVC-a, idiopatske fibroze i disekcije aorte²⁰. Rizik od smrti tijekom spolnog odnosa u bolesnika s neishemijskom bolešću srca može izazvati anksioznost i depresivnost u takvih bolesnika i njihovih partnera.

U nedavnom istraživanju koje je proveo *Finocchiaro* povezanost SCD-a sa spolnim odnosom bila je rijetka i pojavila se u 17 od 6847 bolesnika (0,2 %), od kojih je u 8 bolesnika bila prisutna neishemijska bolest srca¹. Prima izvještaju Pariškog SDEC Registra, pojava SCD-a uzrokovana spolnom aktivnošću je rijetka (<1 %), ali je neishemijska strukturna bolest bila uzrok 12,5 % smrtnih slučajeva povezanih sa spolnim odnosom¹⁸. Sveukupno gledano, neishemijske bolesti srca imaju vrlo nizak rizik od smrti uzrokovane aritmijama tijekom spolnog odnosa kad se u spolne aktivnosti ulazi na siguran način. Bolesnike i njihove partnere trebalo bi upoznati s prisutnošću niskog rizika od aritmija i SCD-a tijekom spolnog odnosa.

LQTS i CPVT bolesti su ionskih kanala koje mogu dovesti do aritmija poput ventrikularne tahikardije TdP ili polimorfne ventrikularne tahikardije (PMVT), koja se može razviti u ventrikularnu fibrilaciju. Na temelju analize elektroničkih zdravstvenih podataka bolesnika koji su bili liječeni u Klinici za genetsku srčanu aritmiju, vjerojatnost događaja vezanih uz spolni odnos bila je veća u bolesnika s CPVT-om nego u onih s LQTS-om. Kardiološki događaji izazvani spolnim odnosom pojavili su se u dvoje od četrdeset i tri bolesnika s CPVT-om (4,7 %), no nisu zabilježeni ni u jednog s LQTS-om²¹. Iako je pojavnost aritmija i SCD-a izazvanih spolnim odnosom u bolesnika s LQTS-om niska, zabilježeni su slučajevi TdP-a uzrokovana orgazmom u bolesnika sa sindromom dugog QT-intervalu (LQT2) tipa 2 s mutacijama (c.361 del) u genu KCNH2 (kromosom 7q36)²². Liječenje beta-blokatorima može smanjiti vjerojatnost smrtonosnih aritmija u ovakvih bolesnika. Primjereno savjetovanje o sigurnosnom profilu spolnog odnosa u bolesnika s KV bolešću koja je dobro kontrolirana lijekovima može ohrabriti i umiriti bolesnike i njihove seksualne partnere.

IMPLANTABILNI KARDIOVERTERSKI DEFIBRILATORI

tachycardia and ventricular fibrillation. Although patients with IHD are often advised to safely resume sexual activity to prevent reinfarction and angina, less often is the issue of cardiac arrhythmias and lay cardiopulmonary resuscitation (CPR), primarily for the partner. Although cardiac death during sexual intercourse is rare, there are close witnesses in almost all cases, so it is surprising that survival rates after sex-associated SCD are almost one fifth lower due to the low rate of chest compressions¹⁸. Educating a partner on CPR can not only save the patient's life, but can reduce fear and anxiety associated with sex and increase the frequency of sexual intercourse. Women's sexual activity after myocardial infarction showed reduced desire and reduced frequency due to fear of death during sexual activity¹⁹.

NON-ISCHEMIC HEART DISEASE AND INHERITED CARDIOVASCULAR SYNDROMES

Cardiac arrhythmias and SCD may occur in patients with non-ischemic structural heart disease or in structurally normal hearts, such as those with ion channel disease and other inherited cardiovascular syndromes. Non-ischemic structural heart disease such as hypertrophic cardiomyopathy (HCM), arrhythmogenic ventricular cardiomyopathy (AVC), idiopathic fibrosis and aortic dissection have been reported in case reports²⁰. The risk of death during sex in patients with non-ischemic structural heart disease and their partners may cause anxiety and depression.

In Finocchiaro's recent study, SCD associated with sex was rare, occurring in 17 of 6847 cases (0.2%), 8 of these patients with non-ischemic cardiac disease¹. Similarly, the Paris-SDEC registry (Paris Sudden Cardiac Death Expertise Center) reported that SCD due to sex was rare (<1%), but non-ischemic structural heart disease accounted for 12.5% of sex-related deaths¹⁸. Overall, non-ischemic cardiac disease has a very low risk of arrhythmia-related death during sex, with safe participation in sexual activity. Patients and their partners should be made aware of the low risk of cardiac arrhythmias and SCD during sex.

LQTS and CPVT are ion channel diseases, which can lead to cardiac arrhythmias such as torsade de pointes (TdP) ventricular tachycardia, or polymorphic ventricular tachycardia (PMVT), which can progress to ventricular fibrillation. Based on an electronic medical review of patients seen by the Genetic Heart Rhythm Clinic, sex-related cardiac events were more likely to be common in CPVT than in LQTS. Sex-induced cardiac events occurred in two of forty-three patients with CPVT (4.7%) but in none of the patients with LQTS²¹. Despite a low incidence of sex-induced cardiac arrhythmias or SCD in patients with LQTS, orgasm-induced torsades de pointes VT in patients with type 2 long QT syndrome (LQT2) has been reported in patients with mutations (c.361 del) in the KCNH2 gene (chromosome 7q36)²². Treatment with beta-blockers may reduce the likelihood of fatal arrhythmias in these patients. Appropriate counselling about the safety profile of sex in patients in cases well controlled with medication can provide reassurance to the patient and their sexual partner.

IMPLANTABLE CARADIOVERTER DEFIBRILLATOR

Implantable cardioverter defibrillator (ICD) devices can be given for primary and secondary prevention indications to our potential patients with life-threatening arrhythmias. It is

U bolesnika sa životno ugrožavajućim aritmijama može se primijeniti implantabilni kardioverterski defibrilator (ICD) na temelju indikacija za primarnu i sekundarnu prevenciju. To je uređaj koji spašava živote, no strah od električnog udara tijekom spolnog odnosa može izazvati znatnu anksioznost i suzdržavanje od spolne aktivnosti. Savjetovanje bolesnika prije i nakon implantacije uređaja može umanjiti anksioznost u bolesnika kojima je potreban ICD. Prema stavu AHA, spolna se aktivnost može preporučiti u primarnoj prevenciji u bolesnika s ICD-om i kao sekundarna prevencija u onih s ICD-om koji mogu provesti tri do pet MET-a bez ventrikularne tahikardije (VT) ili ventrikularne fibrilacije (VF). Spolna se aktivnost treba odgoditi u bolesnika koji su doživjeli više šokova za srce, sve dok se ne stabilizira osnovni uzrok ili dok se ne započne s antiaritmijском terapijom s osnovnim sedativom^{23,24}.

Optimalno sudjelovanje bolesnika u spolnoj aktivnosti nakon postizanja 3 – 5 MET-a najbolje se postiže kroz KV rehabilitaciju, čime se može poboljšati seksualna funkcija²⁵. Osim rehabilitacije, ciljana ablacija koju je proveo elektrofiziolog također može pomoći bolesnicima kroz poboljšanje razine njihove tjelesne aktivnosti. Nažalost, unatoč primjeni najbolje medicinske prakse, seksualna se disfunkcija svedeno može pojaviti u sklopu progresije osnovne bolesti i kao nuspojava propisanih KV lijekova.

Eretilna disfunkcija i suhoća rodnice mogu se pojaviti kao nuspojave KV lijekova, često otežavajući intimne spolne odnose, a mnogi bolesnici zbog toga prekidaju liječenje bez obavješćivanja svojeg liječnika, što može dovesti do nekontroliranih aritmijских događaja, nepotrebne ugradnje ICD-a i, u rijetkim slučajevima, do SCD-a. Za eretilnu se disfunkciju preporučuje uporaba inhibitora fosfodiesteraze tipa 5 umjesto dugodjelujućih nitrata, dok se suhoća rodnice može učinkovito liječiti topičkim estrogenim pripravcima^{26,27}. Sve se te mjere mogu dopuniti dobro odabranom terapijom za parove.

Zaključak

Spolni su odnosi bitan dio ljudskog života i reprodukcije koji pridonosi općem stanju i kvaliteti života bolesnika. U većini je slučajeva sudjelovanje u spolnom odnosu sigurno i bez rizika od iznenadne smrti ili aritmije. Međutim, ako dođe do životno ugrožavajućih događaja tijekom seksualne aktivnosti koja se provodi rijetko, ishod je često tragičan. Bolesnici i njihovi partneri trebali bi biti svjesni da je ulazak u spolni odnos razuman i siguran u većini situacija. S druge strane, bolesnicima bi trebalo pružiti individualno prilagođene savjete i obrazovanje o tome kako u najvećoj mjeri smanjiti rizik od aritmija ili SCD-a, koje mogu biti posljedica njihova stanja, koristeći se modernim liječenjem ablacijom. Preporučuje se izbjegavanje seksualnih stimulansa koji nisu odobrila nadležna tijela, a nužno je i da su sudionici i partneri sposobni provesti laičku reanimaciju. Kardiolozi odnosno specijalisti za rehabilitaciju provode procjenu rizika u bolesnika s rizikom od aritmija primjenom testiranja opterećenjem, pa se stoga uključivanjem bolesnika u rehabilitaciju mogu poboljšati ishodi postizanjem poboljšane aerobne kondicije.

a life-saving device, yet fear of shock during sexual intercourse can cause significant anxiety and abstinence from sexual activity. Counselling before and after device implantation can reduce anxiety in patients who need an ICD. According to the AHA position statement, sexual activity can be performed as primary prevention in patients with ICDs and as secondary prevention in ICD wearers who are able to complete three to five METs without VT or VF. Sexual activity should be delayed in patients who have had multiple shocks until the underlying cause is stabilized or until antiarrhythmic treatment with a core sedative^{23,24}.

Optimizing patients to participate in sexual activity after completion of 3-5 METs can be optimally achieved through cardiac rehabilitation can improve sexual function²⁵. In addition to rehabilitation, targeted ablation by an electrophysiologist can also help patients by improving their physical activity levels. Unfortunately, despite best medical practice, sexual dysfunction can still occur as a progression of the patient's underlying disease and as a side effect of prescribed cardiovascular medications.

Erectile dysfunction and vaginal dryness can occur as side effects of cardiovascular drugs, often making intimate intercourse difficult, and many patients leave treatment without informing their doctor, leading to uncontrolled arrhythmic events, unwarranted ICD operation and, rarely, SCD. For erectile dysfunction, the use of phosphodiesterase 5 inhibitors is recommended over long-acting nitrate preparations, while vaginal dryness can be effectively treated with topical estrogen preparations^{26,27}. All these can be complemented by well-chosen couple therapy.

Conclusion

Sex is an essential part of life and reproduction, contributing to overall well-being and quality of life.

In most cases, sex is safe without risk of sudden death or cardiac arrhythmia. However, if life-threatening events occur during infrequent sexual activity, the outcome is often tragic. Patients and their partners should be aware that sex is reasonable and safe in most situations. They should, however, receive personalized advice and education on how to minimize the risk of cardiac arrhythmias or SCD that may accompany their condition, using modern medical ablation treatments. Avoidance of sexual stimulants not approved by the authorities is recommended, and the bystander/partner's proficiency in lay resuscitation is inevitable. Cardiologists and rehabilitation specialists perform risk assessment of patients at risk of arrhythmias using exercise stress testing and are able to improve outcomes by involving patients in rehabilitation through improved aerobic conditioning.

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