

# Učestalost i rizični čimbenici neželjenih kardiovaskularnih ishoda u bolesnika koji čekaju na kardiokirurški zahvat

## Frequency and risk factors of adverse cardiovascular events in patients awaiting cardiac surgery

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**Uvod:** Većina bolesnika koji zahtijevaju kardiokirurško liječenje provede određeno vrijeme na listi čekanja za operativni zahvat. Prethodne studije su pokazale kako u tih bolesnika postoji rizik novih kardiovaskularnih (KV) događaja.<sup>1,2</sup> Cilj istraživanja bio je utvrditi učestalost neželjenih KV događaja, u bolesnika obrađenih u Zavodu za kardiologiju Kliničke bolnice Merkur, koji čekaju kardiokirurško liječenje. Pokušali smo utvrditi i povezanost pojavnosti neželjenih KV događaja i određenih kliničkih značajki bolesnika.

**Bolesnici i metode:** U istraživanje su uključeni bolesnici koji su prihvaćeni za kardiokirurško liječenje u razdoblju od ožujka 2013. do kraja 2016. godine. Kliničke karakteristike bolesnika dobivene su uvidom u centralni bolnički sustav, a podaci o neželjenim KV ishodima telefonskim kontaktom s bolesnicima uz pregled medicinske dokumentacije ukoliko je ista bila dostupna. Neželjeni ishod je bio definiran pojavom smrti, moždanog udara (CVI), infarkta miokarda (IM) ili srčanog popuštanja.

**Rezultati:** Prikupljeni su podaci za ukupno 333 bolesnika. Srednje razdoblje praćenja, odnosno vrijeme do operativnog zahvata ili nastupa neželjenog ishoda iznosilo je 238,51 dana (raspon 3 do 1269 dana). Ukupno su zabilježena 33 (9,9%) neželjena ishoda. Od brojnih testiranih kliničkih podataka samo su podatak o preboljenom CVI ( $p = 0,002$ ; HR 1,77-13,23) i prisutnost šećerne bolesti ( $p = 0,036$ ; HR 1,06-5,69) pokazali neovisnu povezanost s pojavom neželjenih ishoda. Podatak o preboljelom IM bio je granično značajno povezan s KV događajima ( $p = 0,05$ ; HR 0,99-6,37). Svi ostali podaci uključivo i one o opsegu koronarne bolesti srca i/ili prisutnosti valvularne patologije nisu se pokazali kao značajni prediktori neželjenih ishoda.

**Zaključak:** U bolesnika koji su na listi za kardiokirurško liječenje moguće je očekivati pojavu neželjenih KV ishoda. Anamnestički podaci o preboljenom CVI, prisutnosti šećerne bolesti, a dijelom i o preboljelom IM poveznici su s većom učestalosti takvih ishoda.

**Introduction:** Most of the patients scheduled for cardiac surgery spend certain amount of time on the waiting list. Previous studies have shown that those patients have a risk of new major adverse cardiovascular events (MACE) while awaiting surgery.<sup>1,2</sup> The first goal of this study was to determine the frequency of occurrence of MACE in patients awaiting cardiac surgery after being invasively assessed at the Department of Cardiology of University Hospital "Merkur". Furthermore, we tried to find association of various clinical characteristics and higher degree of MACE.

**Patients and Methods:** Data were collected from patients presented at out heart team meetings in the period from March 2013 to the end of 2016. Relevant clinical characteristics, of patients regarded as good cardiac surgery candidates, were gathered from central hospital system. Information regarding MACE were collected via telephone contact with a patient or its family and through examining medical documentation if it was available MACE was defined as either death, stroke, myocardial infarction or heart failure.

**Results:** We gathered data from 333 patients. Mean follow-up time, defined as a time to surgery or to MACE, was 238.51 days (range 3 to 1269 days). There were 33 (9.9%) adverse events. From various clinical parameters that were tested only previous stroke ( $p=0.002$ ; HR 1.77-13.23) and diabetes ( $p=0.036$ ; HR 1.06-5.69) were independently associated with higher rate of MACE. Previous myocardial infarction showed a marginal association with higher rate of MACE ( $p=0.05$ ; HR 0.99-6.37). None of the other relevant clinical data, including the data on the extent of the coronary disease or/and associated valvular pathology was found to be related to occurrence of MACE.

**Conclusion:** In patients awaiting cardiac surgery one can expect adverse cardiovascular events to occur. Previous stroke, diabetes and to some extent previous myocardial infarction were found to be related to higher degree of such events.

### LITERATURE

1. Seddon ME, French JK, Amos DJ, Ramanathan K, McLaughlin SC, White HD. Waiting times and prioritization for coronary artery bypass surgery in New Zealand. *Heart.* 1999 Jun;81(6):586-92. <https://doi.org/10.1136/hrt.81.6.586>
2. Ray AA, Buth KJ, Sullivan JA, Johnstone DE, Hirsch GM. Waiting for Cardiac Surgery Results of a Risk-Stratified Queuing Process. *Circulation.* 2001 Sep 18;104(12 Suppl 1):92-8. **PubMed:** <https://www.ncbi.nlm.nih.gov/pubmed/11568037>