ISSN 2466-2623
UDK 614.2

Resuscitacioni Savet Srbije

Journal Resuscitatio Balcanica

OFFICAL JOURNAL OF SERBIAN RESUSCITATION COUNCIL

GODINA 3, BROJ 6, FEBRUAR 2017.

IMPRESUM
Journal Resuscitatio Balcanica – stručni časopis
Izdavač: Resuscitacioni savet Srbije

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Izdavanje časopisa finansira Resuscitacioni savet Srbije iz članarine
Časopis objavljuje stručne i naučne radove članova Resuscitacionog saveta i članova partnerskih organizacija.
Časopis izlazi tri puta godišnje.

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Impress Solution d.o.o. Novi Sad
Priprema za štampu i štampa:
Impress solution d.o.o. Novi Sad
Tiraž: 150 primeraka
Izrada CIP katologizacije – Matica Srpska

CIP - Каталогизација у публикацији Библиотека Матице српске, Нови Сад

614.2

JOURNAL Resuscitatio Balcanica : stručni časopis / glavni i odgovomi urednik Zlatko Fišer. - God. 1, br. 1 (2015)- . - Novi Sad : Resuscitacioni savet Srbije, 2015. - 29 cm
Tri puta godišnje.

ISSN 2466-2623
COBISS.SR-ID 299280391

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UDK 614.2 ISSN 2466-2623

Resuscitacioni Savet Srbije

Journal Resuscitatio Balcanica

Stručni časopis

Novi Sad, 2017 Godina III broj 6

Sadržaj

Uvodnik
Editorial

Poštovani čitaoci,
Pred nama je treća godina izdavanja časopisa Journal Resuscitatio Balcanica.
Ovaj časopis plod je entuzijazma malog broja ljudi, uostalom i oblast medicine kojom se bavi nije baš ukorenjena u srpskom zdravstvu.
U stvari gotovo i da ne postoji naučna oblast koju definiše pojam Resuscitaciona medicina stoga svaki rad i svako saopštenje u ovoj oblasti je dragoceno i sasvim sigurno predstavlja korak bliže ka naučnoj zajednici koja se pitanjima Resuscitacione medicine bavi.
Još je veći izazov da se prikupi istraživačka i stručna misao u jednoj novoj naučnoj oblasti iz jedne Evropske regije a posebno regije koju opterećuju brojne podele i sukobi.
No korak po korak mi napredujemo ka ciljevima koje smo postavili. Kroz program EuReCa prati se pojava Srčanog zastoja i objavljuju dragoceni podaci o epidemiologiji ovog oboljenja koji su sasvim sigurno dragoceni jer ih do sada uopšte i nije bilo.
Obuku i njena dostignuća prate odgovarajuće manekenske studije.
Od ovog broja u našem časopisu redovno objavljujemo radove naših kolega iz Grčke, Medicinskog fakulteta iz Atine.

Naš cilj je da tokom 2017 naš časopis postane zaista časopis regije Balkana, kroz izabranih stručnih saopštenja u svakom od narednih brojeva.

Journal Resuscitatio Balkanica – godina III ▪ broj 6.
ISSN 2466-2623
UDC 616.31-051:615.816/.817
616.31-051:37

Evaluation of resuscitation knowledge and skills in Dentists before and after a European Resuscitation Council CPR/AED course

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Abstract

Introduction:
To investigate the level of knowledge of Greek dentists in cardiopulmonary resuscitation (CPR) and of the use of the Automated External Defibrillator (AED) before and after participating in a European Resuscitation Council (ERC) CPR/AED course.

Materials and methods:
A theoretical knowledge questionnaire consisting of multiple choice questions was completed by the participants at the beginning of the CPR/AED course. The participants were re-evaluated at the end of the course, while the evaluation procedure consisted of two distinct parts: a 10-min written test which preceded a simulated cardiac arrest scenario.

Results:
The average performance of the participants in pre-course written test was satisfactory, while the dentists who had attended a CPR/AED course in the past achieved significantly higher initial performance in contrast to their colleagues (p=0.028). There was a statistically significant increase in post-course test score compared to pre-course test score (8.3±1.2 vs. 5.7±1.9, respectively; p<0.001). In addition, participation in a CPR/AED course had a positive effect on the participant's skills, as their performance was excellent at the end of the course.

Conclusions:
Dentists' resuscitation knowledge and skills were significantly improved after participating in ERC CPR/AED courses.

Introduction

Cardiac arrest is a major cause of death worldwide (1-3). In the United States (USA), the referring frequency of occurrence of out-of-hospital cardiac arrest (OHCA) in individuals aged between 50 and 79 is 1.9/1000 per year (2). In Europe, the annual incidence of out-of-hospital cardiac arrest (OHCA) for all rhythms is 38 per 100,000 population, while the annual incidence of ventricular fibrillation (VF) arrest is 17 per 100,000 (3). On initial heart rhythm analysis, about 25–30% of OHCA victims have VF, but when the rhythm is recorded, soon after collapse, the incidence can be as high as 59–65% (4,5). For every minute that defibrillation is delayed, survival from witnessed VF decreases by 10–12%, while survival to hospital discharge can be as high as 75%, if defibrillation is performed within 3 min of collapse (6-8).

In a British study, cardiac arrest was extremely rare in dental practice with an incidence of 0.002 cases per dentist per year (9), while in Germany, it was estimated that one sudden cardiac arrest occurs per 638,960 patients in dental practice (10). Considering however that dentists today treat a growing number

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KLJUČNE REČI:
cardiopulmonary resuscitation; automated external defibrillator; dentists

DATUM PRIJEMA RADA
10. oktobar 2015.
DATUM PRIHVATANJA RADA
20. oktobar 2015.
DATUM OBJAVLJIVANJA
10. jun 2016.

of elderly patients and patients suffering from serious illnesses, they may need to be competent in performing high quality cardiopulmonary resuscitation (CPR). The aim of our study was to investigate the level of knowledge of Greek dentists in cardiopulmonary resuscitation (CPR) and the use of the Automated External Defibrillator (AED) before and after participating in a European Resuscitation Council (ERC) CPR/AED course.

Methods

The study was conducted in Athens, Greece, recruiting dentists who had applied on their own will for CPR/AED training at the Hellenic Society of CPR. Participants were all individuals aged >25 years, while participation to the study was voluntary with participants giving informed consent.

Questionnaire

A questionnaire consisting of multiple choice questions was used in our study. This questionnaire has been described elsewhere and has been used previously (11). The questionnaire consisted of two parts, i.e. demographics and 10 multiple choice theoretical knowledge questions with only one correct answer that surveyed familiarity with the 2010 ERC CPR/AED guidelines (Appendix). Each of the questions of the course test surveying theoretical knowledge was followed by four possible answers, one of which was correct. One point was allocated to any correct answer with no negative marking; therefore, the total maximum score was 10. The test was scored in order to ensure a uniform theoretical knowledge among the participants of the study, while competency was arbitrarily set and was indicated when the candidate answered correctly at least eight questions (80%).

CPR/AED Course format

During the study period, three ERC CPR/AED courses with dentists were organized as previously described (11). The ratio of instructor to candidates was 1:6, with at least one manikin and one AED for each group of six candidates (12). The manikin used was 'Little Anne' (Laerdal Medical Corporation, NY, USA). The AED used was the Zoll AED plus-Trainer with self-adhesive defibrillation pads. An AED connector that simulates different cardiac arrest rhythms was also used for training purposes.

The instructor group comprised of ERC-certified CPR/AED instructors, while all dentists were instructed by the same group to ensure uniform training, as previously described (13). All instructors were certified providers, nominated by the course faculty as having instructor potential, who have successfully completed the CPR/AED instructor course and have achieved instructor status after being successfully monitored as instructor candidates for a minimum of two CPR/AED courses. The participants were formally evaluated at the end of the course, while the evaluation procedure consisted of two distinct parts: a 10-min written test (Appendix) which preceded a simulated cardiac arrest scenario.

The testing scenario

After a 2 min introduction by two instructors, the trainee took the role of the rescuer and had to recognize cardiac arrest and effectively provide CPR according to the CPR/AED algorithm. The scenario given to each participant was a patient, found unconscious, who required the use of an AED in a public place. The initial cardiac rhythm when the AED was attached was VF (13). The same scenario was used for each participant, who was then asked to perform the CPR/AED algorithm in real time (defibrillation–2 min CPR–defibrillation), until professional care arrived. The instructors used the usual skills testing sheet criteria to determine if the trainee has demonstrated each step of the skill correctly and to record the student's results. Each parameter in the checked list was considered to be completed successfully, only if both of the instructors agreed. An appropriate performance in this simulated scenario is required to get the "pass" grade. Any mistakes during the scenario testing led to "retest" grade and re-examination of the candidate. Repetition of these mistakes resulted in failure to complete the course.

Statistical Analysis

Data are expressed as mean ± 1 standard deviation (S.D.) for continuous variables and as frequency (percentage %) for categorical data. The normality of the distributions was assessed with Kolmogorov-Smirnov test and graphical methods. Comparisons of continuous variables were performed using Student's t-test and Mann-Whitney's U, non-parametric test, as appropriate. Categorical data were compared by the $\chi 2$-test, or Fisher's exact test, as required. Pearson's correlation coefficient and Spearman's rho were calculated in order to examine linear relationships between variables. All tests were two-sided. Differences were considered as statistically significant if the null hypothesis could be rejected with >95% confidence ($p<0.05$).

UDC 616.31-051:615.816/.817
616.31-051:37

Results

Of the 74 dentists who were initially invited, all (100%) were recruited in our study. The demographic characteristics of the respondents are shown in Table 1. Of them, 48 (65.8%) knew what an AED is, while 73 (98.6%) declared that there is not an AED available in their work place. Moreover, 13 (26.5%) had attended a CPR/AED course in the past but did not know what an AED is.

In our study, 48 (66.7%) dentists stated that they have little confidence in providing CPR and delivering defibrillation, 22 (30.6%) that they have no confidence at all, and only 2 (2.8%) of them are very confident in CPR and defibrillation delivery. The participants who were very confident in CPR achieved lower performance at the multiple choice compared to those who stated that they have little confidence (p=0.026) and those that claimed that they have no confidence at all (p=0.026).

Written test

The average performance of the participants in pre-course written test was poor (5.7±1.9). Of note, 62 (83.6%) failed to give a correct answer in question 3 and 54 (73%) failed in question 5. The dentists who had attended a CPR/AED course in the past achieved significantly higher initial performance in contrast to their colleagues (p=0.028). In our study, there was a statistically significant increase in post-course test score compared to pre-course test score (8.3±1.2 vs. 5.7±1.9, respectively; p<0.001) (Table 2).

Practical evaluation

In cardiac arrest scenario, most dentists' performance was excellent and achieved a "pass" grade. Eleven (14.9%) dentists who did not call for help and 7 (9.4%) who did not provide effective chest compressions completed the course after successful re-examination (Table 3).

Discussion

Although cardiac arrest in the dental practice is rare, dentists should be competent in providing CPR and use the AED. Indeed, increasing evidence suggest that the ability of the dentist to initiate primary management is the key to minimizing morbidity and mortality (9,14). The most important finding of our study, which is the first one conducted in Greece aiming at evaluating the knowledge of Greek dentists in CPR/AED, was

Table 1. Demographic characteristics of the participants [**N** (%)]

Sex	Male	39 (52.7)
	Female	35 (47.3)
Age ($\bar{x}$ ± SD)	Male	47.5±10.53
	Female	40.3±10.65
Postgraduate Studies	MSc	13 (17.6)
	PhD	2 (2.7)
Time since graduation ($\bar{x}$ ± SD)	Male	20.3±10.16
	Female	13.7±9.01
Work Sector	Public sector	3 (4.1)
	Private employee	1 (1.4)
	Freelance	69 (94.5)
Training in CPR/AED in the past	Yes	49 (66.2)
	No	25 (33.8)
Training in CPR/AED during undergraduate studies	Yes	34 (46.6)
	No	39 (53.4)
Necessity of CPR/AED for the dentists	Yes	71 (95.9)
	No	3 (4.1)
Knowledge of AED	Yes	48 (65.8)
	No	25 (34.2)
Existence of AED in the work place	Yes	1 (1.4)
	No	73 (98.6)
Previous participation in CPR	Yes	3 (4)
	No	71 (96)

CPR = cardiopulmonary resuscitation; AED = automated external defibrillator.

Table 2. Number of correct answers in written test n (%)

Question	1	2	3	4	5
Prior to the course	40 (54.1)	52 (70.3)	12 (16.4)	57 (77)	20 (27)
At the end of the course	57 (79.2)	68 (94.4)	53 (73.6)	72 (100)	70 (97.2)
Question	6	7	8	9	10
Prior to the course	52(70.3)	68 (91.9)	45 (60.8)	39(52.7)	36 (48.6)
At the end of the course	69 (95.8)	68 (94.4)	48 (66.7)	44 (61.1)	49 (68.1)

that they lack the knowledge needed in order to be able to provide early high quality CPR and use the AED. According to the Resuscitation Council of the United Kingdom (UK), all dentists should undergo training in CPR and basic airway (15). Although specific legislation has been enacted in our country in 2007 regarding the compulsory training of all health care professionals in CPR/AED and most of our participants reported that it is necessary for the dentist to be certified in CPR/AED, only 46.6% of them were trained in CPR/AED in the past. However, health authorities must implement this legislation as soon as possible. In UK, dental students participate in a similar course at least once during their study period (16), while in USA, training in medical emergency is obligatory in 41 out of 43 Schools of Dentistry. Specifically, in 22 (51%) of 43 Schools of Dentistry, education in medical emergencies is a distinct course, while in the remaining Schools it is incorporated in other courses (17).

In our study, most dentists stated that they have little confidence or that they do not have confidence at all in performing CPR which is consistent with literature (10,18,19). This can be explained not only by the lack of training and awareness of current guidelines, but also, by the rapid deterioration of CPR/AED skills after the initial training. Various studies reported that about 88% of those who attend a CPR/AED course are not competent in providing effective CPR within a period of a year after the end of course (5,20-22).

Despite the fact that both the knowledge and skills of the participants improved after attending the CPR/AED course the majority of dentists reported that there is no AED available in their work place. This could be attributed to the fact that the vast majority of them work at the own private practice and the cost of an AED acts as a deterrent. At the same time, there is no national legislation that obliges the dentists to acquire an AED as well. Knowing that prompt defibrillation saves lives, we believe that it is unacceptable for a dentist not to have an AED among his/her resuscitation equipment and specific legislation should be enacted and implemented as soon as possible towards to this purpose. In the same spirit, the Resuscitation Council of UK specifies that a dental office should include an AED in its basic equipment, while in USA only in some states the dental offices are obliged to include an AED in their equipment by law (23).

Table 3. Evaluation in practical skills

Skill	Successful performance N (%)
Looking for potential dangers	70 (94.5)
Checking responsiveness	71 (96)
Calling for help	63 (85)
Head tilt and chin lift	70 (94.5)
Checking for normal breathing	72 (97.3)
Activating the emergency medical services	73 (99)
Performing high quality chest compressions	67 (90.5)
Giving two effective rescue breaths	69 (93.2)
Maintains a ratio of 30 compressions to 2 ventilations	73 (99)
Switch on the AED	71 (96)
Correctly attaches the pads	72 (97.3)
Allows rhythm analysis whilst making sure that nobody touches the victim	71 (96)
Demonstrates rapid and safe delivery of a shock	72 (97.3)
Minimizes interruptions to chest compressions	69 (93.2)

UDC 616.31-051:615.816/.817
616.31-051:37

Limitations

One limitation of this study is the limited study size. In addition, the environment of a cardiac arrest scenario is controlled and use of the same questionnaire over time might have artificially increased overall CPR success; in a "real-life" cardiac arrest many factors could complicate the process of resuscitation and some lay rescuers might panic easily, with unpredicted outcomes on victims' survival rates (5,12). Finally our study examined the short-term skill and knowledge retention of the participants and long-term deterioration is unknown.

Conclusion

Dentists' resuscitation knowledge and skills were significantly improved after participating in a ERC CPR/AED course. The implementation of the existing legislation regarding the compulsory training of all health care professionals in CPR/AED is mandatory.

Conflict of interest: None
Acknowledgements: Nothing to acknowledge

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Appendix

1. Which of the following is a sign of cardiac arrest?
   a. Severe chest pain.
   b. Dyspnoea.
   c. Choking.
   d. Absence of breath.

2. According to the CPR/AED algorithm, responsiveness can be assessed by:
   a. Calling 112.
   b. Shaking the victim's shoulder and asking loudly: ''Are you okay?''
   c. Getting an AED.
   d. Performing two cycles of CPR and waiting for the victim's response.

3. In case of an unresponsive victim, the first action should be:
   a. Do nothing until someone gets an AED.
   b. Look, listen and feel for breathing.
   c. Activate the EMS.
   d. Shout for help.

4. When calling 112, what information should be available to the EMS center?
   a. The rescuer's name.
   b. The victims' status.
   c. The location.
   d. a, b and c.

5. According to the 2010 European Resuscitation Council guidelines on CPR/AED, what is the correct compression to ventilation ratio?
   a. 30:2.
   b. 5:1.
   c. 15:5.
   d. 10:2.

6. Rescue breaths can be characterized as adequate when:
   a. Air blowing lasts for 2 sec.
   b. Breathing sounds are heard.
   c. The victim's chest rises when blowing into the mouth.
   d. Head tilt/chin lift is not maintained during rescue breathing.

7. An AED can be life-saving in case of:
   a. Heart attack.
   b. Cardiac arrest.
   c. Choking.
   d. Seizures.

8. When there is a readily available AED, the rescuer(s) should:
   a. Plug in the AED.
   b. Turn on the AED.
   c. Attach the pads on the victim's chest.
   d. Continue chest compressions.

9. Touching the victim during shock delivery is not allowed because:
   a. The AED analysis may be wrong.
   b. The AED will not defibrillate the victim.
   c. Lay persons may be shocked accidentally.
   d. All of the above.

10. When breathing is absent, which of the following is the WORST thing you can do?
    a. Performing CPR even though you cannot remember the algorithm.
    b. Using the AED even though you are not sure how to do it.
    c. Waiting for the EMS personnel to arrive.
    d. a and b.

Journal Resuscitatio Balkanica – godina III ▪ broj 6. UDC 616.831-005.1-036.86:616.379
ISSN 2466-2623

Long-term evaluation of neurological impairment scales after ischemic stroke in type 2 diabetic Caucasians

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Abstract

Background

Until now, there is no data regarding long-term predictive ability of stroke impairment scales in diabetic patients. The aim of this prospective study was to evaluate and compare National Institutes of Health Stroke Scale (NIHSS), Orpington Prognostic Scale (OPS), and Scandinavian Stroke Scale (SSS) in predicting outcome of type 2 diabetic patients after ischemic stroke.

Methods

Two-hundred and eighty-eight diabetic patients with ischemic stroke comprised the study population. Baseline neurological evaluation was performed on admission using the NIHSS, OPS and SSS. End points were recurrence of stroke or death within the year following the initial attack.

Results:

Significant correlation between NIHSS and OPS (r=0.89, p<0.001), between NIHSS and SSS (r=-0.92, p<0.001) and between OPS and SSS (r=-0.9, p<0.001) was observed. Baseline NIHSS (OR=1.14, p=0.032), SSS (OR=0.88, p=0.009) and OPS (OR=2.46, p=0.012) were identified as significant predictors of recurrence of stroke or death after major cardiovascular disease risk adjustment such as tobacco smoking, obesity, history of hypertension and atrial fibrillation. Major strokes as defined by OPS (OR=31.6, p<0.001) and NIHSS (OR=28.1, p<0.001) predicted significantly recurrence of stroke or death 12 months following the initial episode**.**

Conclusions:

Baseline NIHSS, SSS and OPS are significant predictors of recurrence of stroke or death within the year following the initial attack after adjustment for major cardiovascular disease risk factors. OPS severity index might represent the most accurate tool in identifying long-term prognosis of ischemic stroke diabetic Caucasian patients.

Introduction

Stroke is a leading cause of long-term disability in the developed countries. In the United States approximately 795,000 people annually experience a new or recurrent stroke (RS), out of which 135,000 are fatal (1), while self-sufficiency is preserved only in 26% of survivors (2). Additionally, of all annual strokes approximately 610,000 are first attacks, whereas 185,000 are recurrent episodes (3).

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KLJUČNE REČI:

schemic stroke; neurological impairment scales; diabetic patients

DATUM PRIJEMA RADA

10. oktobar 2015.

DATUM PRIHVATANJA RADA

20. oktobar 2015.

DATUM OBJAVLJIVANJA

10. jun 2016.

Diabetes is an independent risk factor for ischemic stroke (IS) (4). Studies have shown that diabetes doubles the risk of a new episode and worsens the prognosis in stroke patients (5,6). Additionally, stress hyperglycemia belongs to the impaired glucose tolerance disorders commonly seen after acute stroke and is associated with worse functional outcome in non-diabetic stroke patients (7).

Recording the neurological disabilities of IS patients is time consuming and challenging for the clinician. Therefore, impairment stroke scales have been developed to evaluate the neurologic status, the severity, and the short-term functional outcome of stroke patients. The National Institutes of Health Stroke Scale (NIHSS), the Orpington Prognostic Scale (OPS) and the Scandinavian Stroke Scale (SSS) are commonly used scales available for clinical practice and research (8-10). The NIHSS comprises a 13-item assessment of neurological function including level of consciousness, language, neglect, visual-field loss, extraocular movements, motor strength, ataxia, dysarthria, and sensory loss. Its scores range from 0 to 42 (0 indicates patient with no neurological deficits and 42 a fully impaired patient). OPS's score of motor deficit in arms, proprioception, balance, and cognition, ranges from 1.6 to 6.8 (1.6 represents a fully independent patient in physical functioning and 6.8 a severely deficient patient), while SSS assesses consciousness, extraocular movement, motor strength, orientation, dysarthria, sensory loss and balance. Its scores range from 58 indicating no mental or functional impairment, to 0 indicating full neurological injuries.

Until now, there is no data regarding long-term predictive ability of impairment scales in IS diabetic patients. Therefore, the aim of the present study was to evaluate the relationship between these stroke scales and compare their ability to predict RS or death within 12 months following the initial episode of stroke in diabetic patients.

Materials and methods

This single center, prospective study was conducted in a 480-bed tertiary hospital with 32,000 admissions annually. The study population consisted of 383 consecutive type 2 diabetic Caucasian patients with primary IS who were admitted between January 2008 and September 2010. The research protocol was approved by the hospital's ethics committee, while participation to the study was voluntary and all patients or next of kin gave informed consent.

In our study, acute stroke and its recurrence was defined according to the World Health Organization criteria as "of rapid onset and of vascular origin reflecting a focal disturbance of cerebral function, excluding isolated impairments of higher function and persisting longer than 24 hours" and were confirmed by a brain computed tomography (CT) (11). Categorization of IS subtypes was made according to the Trial of ORG 10172 in Acute Stroke Treatment (TOAST) which includes five categories: 1) large-artery atherosclerosis, 2) cardioembolism, 3) small-artery occlusion (lacune), 4) stroke of other determined etiology and 5) stroke of undetermined etiology (12). All patients underwent thorough diagnostic evaluation including complete medical history for cardiovascular disease (CVD) such as tobacco smoking, obesity, history of hypertension or atrial fibrillation, clinical characteristics and subtype of the stroke, full blood count and blood biochemistry, electrocardiography, brain CT and, in selected patients, spinal tap with cerebrospinal fluid analysis. Comatose patients, patients with hemorrhagic stroke, tumors, or other conditions mimicking at presentation thrombotic stroke or transient ischemic attacks (TIA) were excluded from the study (Fig. 1).

Baseline NIHSS, SSS, and OPS were recorded in each patient by 2 specialists independently at admission and were assessed again after 24 hours in order to exclude TIA and to reconfirm the scores. Their performance was externally certified blindly to allocation by another examiner. It was important to define that stroke severity will not progress after 24 hours and will be similar to its onset. For this reason all patients with onset symptoms more than 6 hours to their examination were excluded from the study. Minor stroke was defined as NIHSS ≤ 13 or SSS > 25, while major stroke

Figure 1. Inclusion and exclusion study criteria of the study.

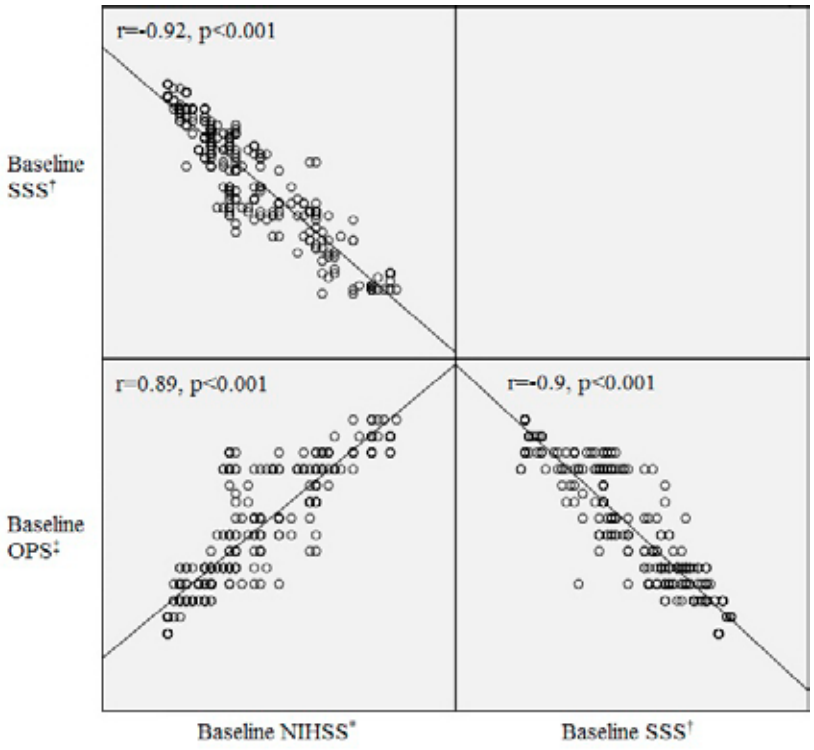

Figure 2. Matrix scatter chart between baseline NIH stroke scale, baseline SSS and baseline OPS. Linear relationship between baseline measurement of scales is highlighted by the diagonal straight line, indicating strong correlation (r≥0.80 or r≤-0.80). *NIHSS = National Institutes of Health Stroke Scale, †SSS = Scandinavian Stroke Scale, ‡OPS = Orpington Prognostic Scale.

as NIHSS > 13 or SSS ≤ 25. According to the OPS, IS was defined as minor with a score < 3.2, as moderate with a score 3.2 to 5.2, and as major with a score >5.2 (13-15). All stroke scales were evaluated for their ability to predict the end-points of our study which were RS or death due to any cause within one year following the initial attack.

Severity adjustment for diabetes was made by excluding patients with long-term complications due to diabetes as retinopathy with potential loss of vision; nephropathy leading to renal failure; peripheral neuropathy with risk of foot ulcers, amputations, and Charcot joints; and autonomic neuropathy causing gastrointestinal, genitourinary, and cardiovascular symptoms and sexual dysfunction. In our patients, glycosylated hemoglobin (HbA1c) was tested every 3 months and a value below the upper limit of normal local equivalent of 6.5% for a Diabetes Control and Complications Trial–traceable assay was required in order to ensure optimal post-stroke recovery. For the same reason, treatment with antihypertensive, antilipidemic and antiplatelet agents were also monitored. At a 3 month-interval, the patients were reevaluated for survival or recurrence of stroke confirmed by brain CT. Surviving patients were examined clinically and plasma HbA1c was measured in order to ensure acceptable diabetes control during recovery. Of the 383 diabetic IS patients that were evaluated, 63 were excluded due to abnormal diabetes control, 18 due to late arrival to the hospital and 14 due to incomplete follow-up. Also, patients not able to be contacted in these time intervals were categorized as lost to follow up.

Descriptive statistics were used to analyze demographics, medical history, prior functional status, stroke characteristics, neurological scores, severity of impairment and outcome. Values were expressed as means ± the standard deviation (continuous variables) or as percentages of the group from which they were derived (categorical variables). Continuous variables were compared by the Student t-test. Categorical variables were evaluated by the Pearson Chi-Square test or Fisher's exact test as appropriate. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated to evaluate the strength of any association that emerged. Evaluation of the linear relationship between NIHSS, OPS and SSS was calculated using Spearman's rank correlation coefficient. Logistic regression analysis was conducted in order to identify how accurately the neurological scales predict new IS or death. Scales were assessed in a continuous manner. Although the sum of OPS list item is ordinal in nature, it has been disputed that in some cases ordinal-level data may be treated as interval-level data without serious problem (16). The goodness of fit of the models was tested by Hosmer and Lemeshow test. Statistically significant values were considered for p≤0.05. Statistical analyses were performed with the SPSS statistical software (version 17; SPSS Inc., Chicago, IL)

Table 1. Baseline characteristics of the study population (n=288).

	n	%	Mean±SD
Age (years)			75.64 ± 7.38
Sex, male	135	46.9	
female	153	53.1	
Major CVD¥ risk			
Hypertension	238	82.6	
Obesity	43	14.9	
Tobacco smoking	50	17.4	
Atrial Fibrillation	42	14.6	
Glycemic indices			
Admission plasma glucose (mg/dl)			153.5 ± 41.9
Glycosylated Hemoglobin (%)			8.58 ± 1.68
Stroke subtype			
Large-artery atherosclerosis	37	12.8	
Cardioembolism	32	11.1	
Small-artery occlusion (lacune)	192	66.7	
Stroke of other determined etiology	10	3.5	
Stroke of undetermined etiology	17	5.9	
Impairment scales			
Baseline NIHSS£			15.2 ± 10.1
Baseline SSS†			32.1 ± 14.2
Baseline OPS‡			3.9 ± 1.4
Severity			
Baseline NIHSS£ > 13 > 13	119 84	41.3 39.6	
Baseline SSS† ≤ 25	96	33.3	
Baseline OPS‡ > 5.2	81	28.1	

¥Cardiovascular Disease, £National Institutes of Health Stroke Scale, †Scandinavian Stroke Scale, ‡Orpington Prognostic Scale. Values were expressed as medians, mean ± the standard deviation (continuous variables) or as frequencies and percentages of the group from which they were derived (categorical variables).

Results

Two-hundred and eighty-eight IS diabetic patients, 135 (46.9%) males and 153 (53.1%) females, comprised the final study population. Mean values for NIHSS, SSS, and OPS were 15.2 ± 10.1, 32.1 ± 14.2 and 3.9 ± 1.4 respectively (Table 1). Twelve months after the initial stroke, 142 out of 288 (49.3%) IS diabetic patients, 70 (24.3%) men (OR=1.21 95% CI:0.76-1.92, p=0.417) and 72 (25%) women (OR=0.82 95% CI:0.51-1.31, p=0.471), suffered RS or died. In particular, RS occurred in 59 (20.5%) patients, 29 (10.1%) women (OR=0.81 95% CI:0.46-1.46, p=0.493) and 30 (10.4%) men (OR=1.22 95% CI:0.68-2.16, p=0.493), while 83 (28.8%) patients, 43 (14.9%) women (OR=0.92 95% CI:0.55-1.54, p=0.776) and 40 (13.9%) men (OR=1.07 95% CI:0.64-1.79, p=0.776) died.

Analysis of factors associated with study's end points within the 12 months following the initial episode did not show significantly gender outcome differences. Of all patients who suffered RS or died, 70 (49.3%) were males (OR=1.21, 95% CI: 0.76-1.92, p=0.417). Diabetic patients with history of hypertension (OR=3.36, 95% CI: 1.7-6.65, p<0.001) or atrial fibrillation (OR=2.99, 95% CI: 1.46-6.11, p=0.002) had significantly higher odds for RS or death, but there was no difference for obese (OR=1.36, 95% CI: 0.71-2.61, p=0.355) or patients that used to smoke tobacco (OR=1.68, 95% CI: 0.91-3.13, p=0.096). Patients with elevated admission plasma glucose (APG) (128.4 ± 29.8 / 179.2 ± 36.6, p<0.001) and HbA1c (8 ± 1.52 / 9.18 ± 1.64, p<0.001) had significantly higher frequencies of RS or death (Table 2).

Lacunar strokes were the commonest TOAST subtypes followed by large-artery atherosclerosis and

Table 2. Analysis of factors associated with recurrence of stroke or death within the 12 months following the initial attack.

Variables	No Recurrence of Stroke or Death	Recurrence of Stroke or Death	Odds Ratio	P Value
	n=146	n=142	(95% CI¶)	
Patient related				
Age (in years)	75.1 ± 8	76.1 ± 6.6	NA§	0.265
Male sex (%)	65 (48.1)	70 (51.9)	1.21 (0.76-1.92)	0.417
Major CVD¥ risk				
Hypertension	109 (45.8)	129 (54.2)	3.36 (1.7-6.65)	<0.001
Obesity	19 (44.2)	24 (55.8)	1.36 (0.71-2.61)	0.355
Tobacco smoking	20 (40)	30 (60)	1.68 (0.91-3.13)	0.096
Atrial Fibrillation	12 (28.6)	30 (71.4)	2.99 (1.46-6.11)	0.002
Glycemic indices				
Admission Plasma Glucose (mg/dl)	128.4 ± 29.8	179.2 ± 36.6	NA§	<0.001
Glycosylated Hemoglobin (%)	8 ± 1.52	9.18 ± 1.64	NA§	<0.001
Stroke subtype				
Large-artery atherosclerosis n (%)	6 (16.2)	31 (83.3)	6.51 (2.62-16.17)	<0.001
Cardioembolism n (%)	15 (46.9)	17 (53.1)	1.18 (0.56-2.48)	0.647
Small-artery occlusion (lacunar) n (%)	108 (56.3)	84 (43.8)	0.51 (0.31-0.83)	0.008
Stroke of other determined etiology n (%)	8 (80)	2 (20)	0.24 (0.05-1.18)	0.059
Stroke of undetermined etiology n (%)	9 (52.9)	8 (47.1)	0.91 (0.34-2.42)	0.849
Impairment Scales (Mean±SD)				
Baseline NIHSS£	8 ± 4.7	22.7 ± 8.6	NA§	<0.001
Baseline SSS†	42.9 ± 7.1	20.8 ±10.5	NA§	<0.001
Baseline OPS‡	2.8 ± 0.7	5.1 ± 1.1	NA§	<0.001
Severity of Ischemic Stroke n (%)				
Major (according to NIHSS£)	9 (7.6)	110 (92.4)	52.32 (23.96-114.25)	<0.001
Major (according to SSS†)	8 (8.3)	88 (91.7)	28.11 (12.76-61.88)	<0.001
Major (according to OPS‡)	2 (2.5)	79 (97.5)	90.28 (21.51-378.87)	<0.001

¥Cardiovascular Disease, £National Institutes of Health Stroke Scale, †Scandinavian Stroke Scale, ‡Orpington Prognostic Scale, §Non-Applicable, ¶Confidence interval.

Values were expressed as mean ± the standard deviation (continuous variables) or as n (%) of the variable from which they derived (categorical variables). Continuous variables were compared by the Student t test. Categorical variables were evaluated by using the Pearson Chi-Square test or Fisher's exact test as required.

cardioembolic strokes (Table 1). However, patients with large-artery atherosclerosis stroke had significantly higher odds (OR=6.51, 95% CI: 2.62-16.17, p<0.001) for RS or death than patients with lacunar stroke (OR=0.51, 95% CI: 0.31-0.83, p=0.008) (Table 2). As expected, higher scores on all stroke scales and major strokes were significantly associated with worse outcome. Interestingly, patients with major stroke according to OPS had higher odds ratio of RS or death (OR=90.28, CI:21.51-378.87) compared to the other stroke scale severity indices (Table 2). Analysis by Spearman's rank correlation coefficient indicated a statistically significant linear relationship between all three stroke scales which were strongly correlated and agreed in the baseline neurological information (Fig. 2). There was significant correlation between NIHSS and OPS (NIHSS:15.2±10.1, OPS:3.9±1.4, r=0.89, p<0.001), between NIHSS and SSS (NIHSS:15.2±10.1, SSS:32.1±14.2, r=-0.92, p<0.001), and between OPS and SSS (OPS:3.9±1.4, SSS:32.1±14.2, r=-0.9, p<0.001), while NIHSS and SSS (NIHSS:15.2±10.1, SSS:32.1±14.2, r=-0.92, p<0.001) revealed the stronger correlation. Association of SSS with the other scales had a negative indicator, specifying an inverse correlation between them. Lower scores on the SSS scale were indicative of severe neurological deficits, whereas lower scores of NIHSS and OPS were indicative of less physical and mental impairments.

Table 3. Logistic regression analysis regarding the predictive ability of impairment scales and their severity indices after major CVD¥ risk factor adjustment.

Variables	Odds Ratio	P Value	Variables	Odds Ratio	P Value
	(95% CI¶)			(95% CI¶)	
Impairment Scales			Severity of Ischemic Stroke n (%)		
Baseline NIHSS£	1.14 (1.01-1.28)	0.032	Major (according to NIHSS£)	28.18 (10.49-75.68)	<0.001
Baseline SSS†	0.88 (0.81-0.97)	0.009	Major (according to SSS†)	1.67 (0.51-5.47)	0.397
Baseline OPS‡	2.46 (1.21-4.99)	0.012	Major (according to OPS‡)	31.61 (6.44-155.04)	<0.001
Major CVD¥ risk			Major CVD¥ risk		
Hypertension	3.35 (0.71-15.67)	0.124	Hypertension	3 (0.9-9.95)	0.072
Obesity	2.59 (0.9-7.47)	0.078	Obesity	2.48 (0.93-6.61)	0.069
Tobacco smoking	1.55 (0.46-5.15)	0.475	Tobacco smoking	2.15 (0.78-5.95)	0.138
Atrial Fibrillation	2.12 (0.41-11.08)	0.373	Atrial Fibrillation	1.89 (0.39-8.98)	0.422

¥Cardiovascular Disease, £National Institutes of Health Stroke Scale, †Scandinavian Stroke Scale, ‡Orpington Prognostic Scale, ¶Confidence interval.

Binary logistic models were used in order to identify the significant predictors of RS or death within the 12 months following the initial stroke episode after major cardiovascular disease (CVD) risk adjustment, such as tobacco smoking, obesity, history of hypertension and atrial fibrillation. Baseline NIHSS (OR=1.14 95% CI:1.01-1.28, p=0.032), SSS (OR=0.88 95% CI:0.81-0.97, p=0.009) and OPS (OR=2.46 95% CI:1.21-4.94, p=0.012) could significantly predict RS or death. However, severity stroke index as defined by OPS (OR=31.61 95% CI:6.44-155.04, p<0.001) had a higher prognostic capacity followed by NIHSS (OR=28.18 95% CI:10.49-75.68, p<0.001), while SSS (OR=1.67 95% CI:0.51-5.47, p=0.397) severity index could not predict RS or death within the 12 months (Table 3).

Discussion

As diabetic patients constitute a high risk group for major cardiovascular events, early diagnosis of IS, accurate assessment of neurological symptoms, and timely therapeutic intervention may result in better prognosis (17). Although many issues have been raised over time regarding their adequacy (16-18), stroke impairment scales have been developed to support physician's diagnosis, prediction of recovery and early establishment of therapeutic goals. However, the ability of these scales to predict RS or death is challenging and difficult because diabetes influences negatively the time of post-stroke recovery.

NIHSS is recognized as one of the most consistent and valid tool of neurological impairment measurement in stroke (8), while various data support SSS to be a very reliable and consistent stroke scale (10,19-21), able to predict mortality in patients with mild ischaemic stroke (18). OPS is a simpler stroke neurological scale which has been documented as a potent instrument for stroke presentation (22), stroke severity categorization, and poor functional outcome (9,22). These scales were developed to evaluate neurological status, but their predictive value is focused primarily to short functional post-stroke outcome. A study by Muir et al. showed that baseline NIH Stroke Scale predicts 3-month outcomes in non-diabetic patients (15), while Kalra and Crome reported that OPS two weeks post-stroke is an indicator for the 14-week post-stroke activities of everyday living scores in elderly patients (23). In another study, Edwards et al. reported that SSS has great sensitivity and specificity in predicting 3 month term mortality, regardless the stroke mechanism (24).

In our study, we evaluated and compared NIHSS, SSS, and OPS regarding long term outcome of IS diabetic patients and found that all three impairment scales have significant prognostic value within the 12 months following the initial episode after major CVD risk factor adjustment. Despite that SSS revealed the stronger correlation with NIHSS, its severity index could not predict RS or death within 12 months in IS diabetic patients. One possible explanation is that NIHSS and SSS exhibit different cutoff values for determining severe stroke. On the other hand, OPS establishes closer focus and certainty on major strokes and, thus, it has a powerful hard-end point predictive ability. However, OPS includes less information in its standardized examined components in comparison with NIHSS and SSS, while it adds points to the final score in an ordinal but symmetric manner. It is focused equally at motor strength, proprioception, balance and cognition, neglecting extraocular movements, facial palsy and dysarthria. In addition, differences are observed

in the method of calculation as lower scores on SSS represent more severe deficits whereas lower scores on NIHSS and OPS are associated with less severe deficits. Nevertheless, despite their different calculation nature, all three stroke impairment scales show a common derivation and interception of structure because they are mainly structured for the evaluation of neurological condition and severity of the stroke during admission. It seems that the resemblance of a lot of standardized assessments between NIHSS and SSS had as consequence their equivalent predictive ability. Their detailed and solid tasks in relation to OPS seem to play an important role in the prognosis of our diabetic patients.

The severity indices of impairment scales dichotomize stroke into two categories, major and minor, while each stroke scale categorizes differently the severity of IS (10,11). Therefore, patients considered to have major stroke according to NIHSS presented with minor stroke according to SSS or moderate stroke according to OPS. NIHSS and SSS divide strokes in major and minor, but OPS stratify them into three categories: minor, moderate and major; that explains the increased accuracy of OPS in our study. Generally, all three impairment scales showed that major stroke occurred more frequently in diabetic patients who suffered RS or died within 12 months. However, major stroke as defined by baseline NIHSS and OPS predicted significantly our study's hard end points, with the latter having higher prediction value than the first.

It is known that stroke in diabetic patients has a specific clinical pattern which is correlated to poor prognosis (25). In our study, lacunar strokes were more frequent compared to other subtypes, followed by atherothrombotic and cardioembolic strokes. However, lacunar strokes were significantly related with less probability of RS or death, while atherothrombotic strokes were related significantly to higher odds of the same end points within the first year. Our results are in agreement with other studies which found lower RS risk and better survival rates for lacunar strokes than for other stroke subtypes (26-29).

Epidemiological studies demonstrate greater decline in stroke death rates in men than in women who have greater stroke mortality rates in ages over 85 years (1). Interestingly, our results revealed insignificant gender incidence differences of RS or death, even though 90% of study's population was younger than 85 years old. This can be explained by the fact that more women than men die of stroke each year due to their larger number (3). Also, diabetes seems to be responsible for higher rates of death between stroke women. Tuomilehto et al. calculated that 16% of all stroke mortality in men and 33% in women could be directly attributed to diabetes (30). Our data indicated that acute hyperglycemia or glycemic deregulation prior to IS is linked to worse outcome. Stress hyperglycemia contributes negatively to stroke prognosis and, compared to diabetic patients, non-diabetic patients are more vulnerable during the acute phase of stroke (31). However, overall definition of stress hyperglycemia is not well identified in diabetic patients because their pre-stress baseline glucose levels remain unknown.

Our study has several limitations. First, the study was conducted in a merely Caucasian population, while its population is restricted by means of originating from a single hospital with similar demographic characteristics. However, the study population consisted of consecutive patients who were prospectively followed-up. Secondarily, patients were not categorised by duration or complications of diabetes, despite the fact that advanced microvascular and macrovascular alterations may elongate time of stroke recovery and influence prognosis. Nevertheless, all scales were found to be significant predictors of RS or death within the year following initial stroke after major CVD risk adjustment.

Conclusions

Neurological stroke scales can be used in order to predict long-term outcome in type 2 diabetic patients of Caucasian origin after IS. NIHSS, OPS and SSS are strongly correlated and predict accurately RS or death after major CVD risk factor adjustment. OPS severity index might represent the most accurate tool in identifying long-term prognosis.

Conflicts of interest: None.

Acknowledgements: Nothing to acknowledge.

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EURECA SRBIJA 2015-2016. - DVOGODIŠNJA ANALIZA
EURECA SERBIA 2015-2016 TWO - YEAR ANALYSIS

Mihaela Budimski[1], Kornelija Jakšić Horvat[1], Milena Momirović Stojković[1], Zlatko Fišer[2]

Sažetak:

Cilj:

Upoređivanje prikupljenih podataka projekta EuReCa sprovedene tokom 2015. i 2016. godine kao i njihova uzajamna analiza.

Metod:

Prospektivna studija, observacionog trijala Evropskog Resuscitacionog saveta koji je pod brojem NCT02236819 registrovan u bazi trijala i odobren od zdravstvenih autoriteta u SAD. Analizirani su prikupljeni podaci u Službama hitnih medicinskih pomoći Subotica, Sombor, Zrenjanin, Kanjiža, Bačka Palanka, Zavoda za urgentnu medicinu Kragujevac i Zavoda za hitnu medicinsku pomoć Niš. Podaci su prikupljani tokom cele 2015. i 2016.godine i od strane glavnog istraživača svake ustanove unošeni u jedinstvenu bazu podataka putem onlajn unosa i aplikacije postavljene na adresi www.eureca.rs.

Rezultati:

Srčani zastoj je potvrđen, od strane lekara hitnih medicinskih pomoći u 2015.godini, 160 puta na 100.000 stanovnika, dok je u 2016, srčani zastoj zabeležen 122/100.000 stanovnika. Mere kardiopulmonalne resuscitacije su započete 63,3 /100.000 stanovnika 2015. a 2016. godine 60/100.000 stanovnika. Najčešći etiološki uzrok srčanog zastoja je kardiološki u obe posmatrane godine: 27,2/100.000 u 2015, odn. 36,5/100.000 u 2016. Mesto nastanka srčanog zastoja u obe godine je uglavnom prebivalište, 48/100.000 u 2015. i 43/100.000 u 2016. U 1,9/100.000 slučaja je telefonski vođen KPR u 2015, u 2016. godini 4,9/100.000. VSZ je osvedočen 45,5/100.000, u 2015. dok je u 2016. osvedočen 42,5/100.000. Od prisutnih svedoka, KPR je započet 5,0/100.000 u 2015. dok je u 2016. neznatno više 6,7/100.000. Inicijalni ritam je bio šokabilan u 12/100.000 u 2015. dok je 33,2/100.000 u 2016. Pre dolaska ekipe HMP AED aparat ni u jednom slučaju nije upotrebljen ni 2015. kao ni 2016. godine. ROSC je postignut kod 10,78 pacijenata na 100.000 stanovnika u 2015. dok je taj broj iznosio 17,6/100.000 u 2016.

Zaključak:

Zahvaljujući dvogodišnjem praćenju, u posmatranom periodu, možemo reći da se znatno povećao broj pacijenata sa šokabilnim ritmom i postignutim ROSC. Uloženi napori i češće edukacije zaposlenih dovode do boljih rezultata i poboljšanja kvaliteta rada.

Abstract

Aim

Comparison of gathered data of project Eureca conducted during 2015. and 2016. as well as their mutual analysis.

Method:

Prospective study, observational trial of the European Resuscitation Council registered in the trial database - NCT02236819 and approved by health authorities in USA. Collected data from the EMS of Subotica, Sombor, Zrenjanin, Kanjiža, Bačka Palanka, Kragujevac and Niš were analyzed. The data were gathered throughout the whole 2015. and 2016. by the main researcher of every institute and filled into the unique base. The import was online. Application is located on the web address www.eureca.rs

Results:

Out of hospital cardiac arrest (OHCA) has been affirmed, by the EMS physicians, in 2015, 160 cases on 100.000 inhabitants, while in 2016, OHCA has been recorded 122/100.000. Cardiopulmonal resuscitation was initiated at 63,3/100.000 in 2015, in 2016, 60/100.000. The most common etiological cause of OHCA is cardiology in both observed years, 27,2/100.000 in 2015, and 36,5/100.000 in 2016. The place of occurrence of OHCA is mostly at home 48/100.000 u 2015. and 43/100.000 in 2016 in observed period. In 1,9/100.000 cases CPR has been guided through the telephone in 2015, in 2016 the number is 4,9/100.000. Bystanders have been present 45,5/100.000 in 2015, while in 2016, bystanders that have been present was 42,5/100.000. CPR was started by bystander 5,0/100.000 in 2015, whilst in 2016, that number is slightly higher 6,7/100.000. Initial rhythm was shockable in 12/100.000 in 2015, while 33,2/100.000 in 2016. AED has not been used in any cases in 2015, and 2016, before EMS arrival. ROSC has been achieved at 10,78/100.000 inhabitants in 2015. That number was 17,6/100.000 in 2016.

Conclusion:

With the help of two year observation in 2015, and 2016, the number a patients with shockable rhythm and achieved ROSC has increased significantly. Invested effort and more frequent educations of employees in EMS bring us to better results and improved quality of work.

USTANOVA

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KLJUČNE REČI:

cardiopulmonary resuscitation;
automated external defibrillator;

DATUM PRIJEMA RADA
10. oktobar 2015.
DATUM PRIHVATANJA RADA
20. oktobar 2015.
DATUM OBJAVLJIVANJA
10. jun 2016.

Uvod:

Vanbolnički srčani zastoj je ozbiljan problem javnog zdravlja. U Americi prosečno na godišnjem nivou, 420.000 osoba doživi srčani zastoj, dok je taj broj u Evropi ~ 275.000 (1). Započinjanje ranog tretmana je od ključnog značaja za ishod srčanog zastoja (2). Prema preporukama Evropskog resuscitacionog saveta (ERC), lanac preživljavanja podrazumeva uključivanje šire društvene zajednice u pristupanju odn. ranom prepoznavanju, ranom započinjanju postupaka reanimacije kao i ranu primenu DC šoka (3). Rana upotreba defibrilatora, povećava šanse za preživljavanje (4). Nacionalni registri u razvijenim zemljama postoje dugi niz godina. Švedska ima registar još od davne 1990. godine i od tada se podaci unose prema Utstein protokolu (5). EuReCa One je prva studija koja omogućuje prikupljanje podataka, u jedinstvenu bazu, iz 27 zemalja širom Evrope (6). Vanbolnički srčani zastoj se u R.Srbiji prati od 2014. godine, od uključivanja brojnih zdravstvenih ustanova u projekat EuReCa One (7). Zahvaljujući prikupljenim podacima omogućeno je poređenje dobijenih rezultata za dvogodišnji period. Ovom analizom će se ustanoviti da li ima razlike u pristupu, tretmanu kao i ishodu srčanog zastoja u posmatranom periodu (8).

Cilj:

Upoređivanje prikupljenih podataka projekta EuReCa sprovedene tokom 2015. i 2016. godine kao i njihova uzajamna analiza.

Metod:

Prospektivna studija, observacionog trijala Evropskog Resuscitacionog saveta koji je pod brojem NCT02236819 registrovan u bazi trijala i odobren od zdravstvenih autoriteta u SAD. Analizirani su prikupljeni podaci u Službama hitnih medicinskih pomoći Subotica, Sombor, Zrenjanin, Kanjiža, Bačka Palanka, Zavodu za urgentnu medicinu Kragujevac i Zavodu za hitnu medicinsku pomoć Niš. Metodologija Studije je utvrdila način šifriranja i čuvanja integriteta ličnosti i poverljivosti podataka o pacijentima koji su obuhvaćeni u ovom istraživanju. Podaci su prikupljani tokom cele 2015. i 2016.godine i od strane glavnog istraživača svake ustanove unošeni u jedinstvenu bazu podataka putem onlajn unosa i aplikacije postavljene na adresi www.eureca.rs.

Rezultati:

Studija obuhvata populaciju od 853.500 stanovnika. Dobijeni rezultati su izraženi u incidenci na 100.000 stanovnika. Srčani zastoj je potvrđen, od strane lekara hitnih medicinskih pomoći 5 Domova zdravlja i 2 Zavoda za hitnu medicinsku pomoć, u 2015. godini 160 puta na 100.000 stanovnika, dok je u 2016, srčani zastoj zabeležen 122/100.000 stanovnika. Mere kardiopulmonalne resuscitacije su započete kod 63,3 /100.000 stanovnika 2015, a 2016. godine u 60/100.000 stanovnika (tabela1.). Najčešći etiološki uzrok srčanog zastoja je kardiološki u obe posmatrane godine: 27,2/100.000 u 2015, odn. 36,5/100.000 u 2016. Mesto nastanka srčanog zastoja u obe godine je uglavnom prebivalište, 48/100.000 u 2015. i 43/100.000 u 2016. U 1,9/100.000 slučaja je telefonski vođen KPR od strane dispečera koji prima pozive 2015, u 2016.godini u 4,9/100.000. VSZ je osvedočen 45,5/100.000, odn. desio se pred prisutnim svedokom u 2015, dok je u 2016. osvedočen 42,5/100.000. Od prisutnih svedoka, KPR je započet 5,0/100.000 u 2015, dok je u 2016. taj broj neznatno veći 6,7/100.000. Inicijalni ritam je bio šokabilan u 12/100.000 u 2015, dok je 33,2/100.000 u 2016. Pre dolaska ekipe HMP AED aparat ni u jednom slučaju nije priključen niti upotrebljen ni 2015. kao ni 2016.godine. ROSC je postignut 10,78/100.000 stanovnika u 2015, dok je taj broj iznosio 17,6/100.000 u 2016. Broj pacijenata koji su predati u bolnicu sa ROSC je 8,9/100.000 u 2015, dok je u 2016. taj broj 11,6/100.000.

Diskusija:

Nakon treće godine opservacione studije dolazimo do mogućnosti poređenja sopstvenih podataka i uočavamo da je broj započetih reanimacija u obe posmatrane godine približno sličan. Tokom 2016.godine, izgradili su se kriterijumi koji su doprineli da je u porastu incidenca kardiološkog uzroka srčanog zastoja, ali je u oba posmatrana perioda to i vodeći etiološki uzrok srčanog zastoja. Mesto nastanka srčanog zastoja se takođe ne razlikuju u razmatranim godinama. Obzirom da se srčani zastoj najčešće dešava u kućnim uslovima, visok je broj prisutnih svedoka pred kojima se dešava kolaps. Međutim, ni tokom 2015, niti tokom 2016. nije veliki broj pokušaja reanimacije od strane prisutnih svedoka ali je uticaj zaposlenih u hitnim medicinskim pomoćima na svedoke znatno veći u 2016.godini što je doprinelo povećanju broja telefonski vođenih postupaka resuscitacije- tri puta više nego prethodne godine. Analizom ovog parametra dolazi se do zaključka da se telefonski KPR najčešće vodi u manjim sredinama i u Službama hitnih medicinskih pomoći koje pripadaju Domovima zdravlja. Da li zbog drugačijeg rada i načina primanja poziva u dispečerskim centrima u Zavodima za hitnu medicinsku pomoć ovakav način vođenja resuscitacije nije moguć, ostaje da se utvrdi. Gotovo tri puta je

povećan broj šokabilnih ritmova u 2016.godini što se može objasniti boljim prepoznavanjem srčanog zastoja od strane dispečera, povećanim brojem postupaka reanimacije od strane svedoka kao i nizom edukacija koje su kontinuirano sprovođene tokom trajanja studije u sredinama koje učestvuju. AED aparat se i dalje ne upotrebljava te je potrebno raditi i na edukaciji građana i širenju svesti o značaju primene istog kod srčanog zastoja na javnim mestima. Znatno je povećan broj pacijenata kod kojih je postupcima resuscitacije postignuta spontana cirkulacija i merljiv puls (ROSC). Podaci o otpustu iz bolnice i preživljavanju nakon 30 dana nisu uzeti u obzir zbog nemogućnosti provere ovih parametara naročito u velikim gradovima koji imaju veći broj bolnica i Kliničkih centara.

Zaključak:

Zahvaljujući dvogodišnjem praćenju, u posmatranom periodu, možemo reći da se znatno povećao broj pacijenata sa šokabilnim ritmom i postignutim ROSC. Uloženi napori i češće edukacije zaposlenih u Službama i Zavodima hitnih medicinskih pomoći dovode do rezultata koji ukazuju da su potrebni česti treninzi i retreninzi svih zaposlenih i obavezan "feed back" o kvalitetu primenjnih resuscitacionih mera što dovodi do poboljšanja kvaliteta rada.

Tabela 1. Utstajn izveštaj o srčanom zastoju – Eureka 2016.

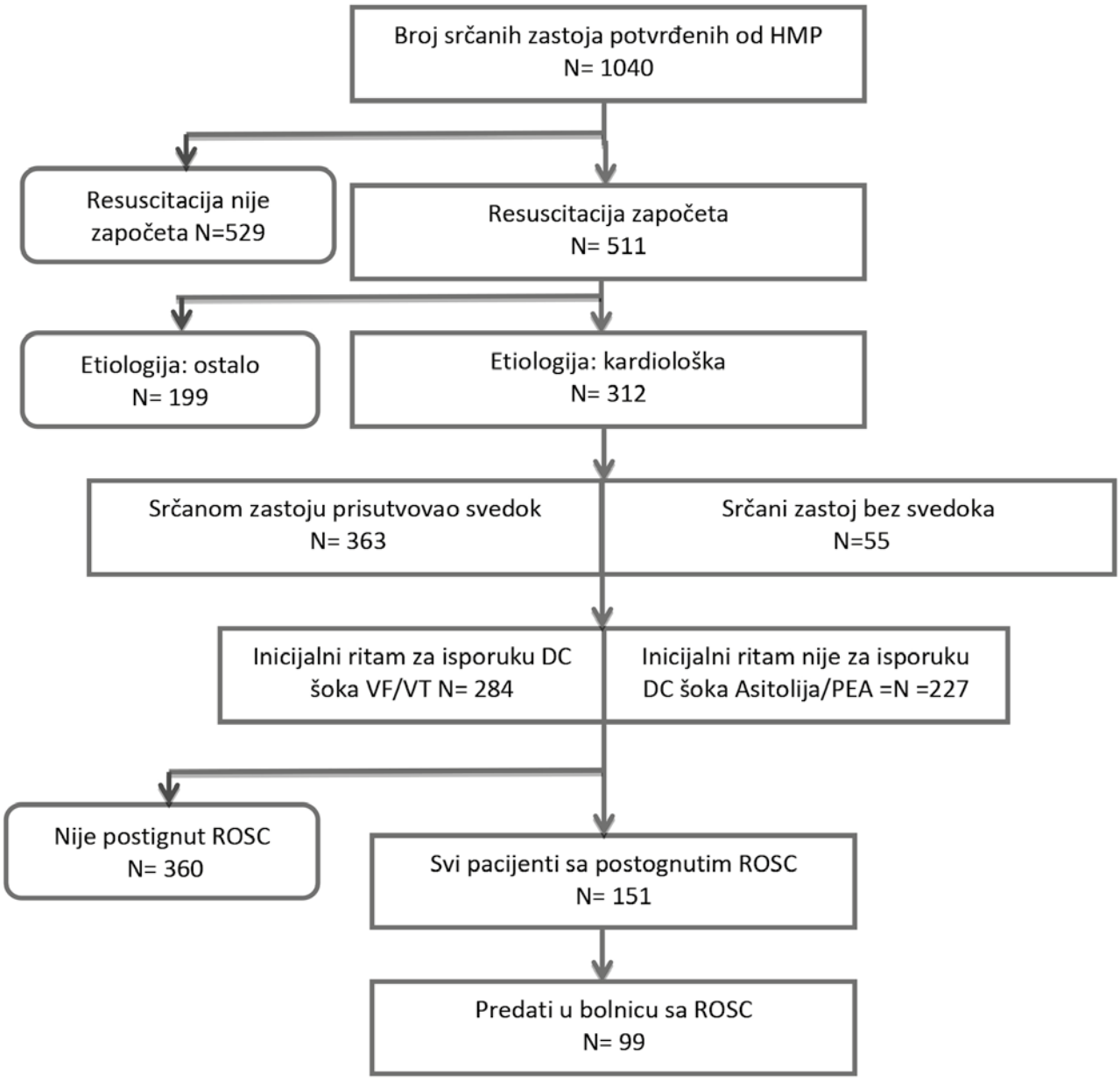

Tabela 2. Prikaz rezultata 2015-2016.

	2015 (n/100.000)	2016 (n/100.000)
Broj srčanih zastoja zabeležen od strane HMP	1366 (160)	1040 (122)
Broj započetih resuscitacija	540 (63,3)	511 (60)
Etiologija - kardiološka	233 (27,2)	312 (36,5)
Mesto nastanka SZ-prebivalište	410 (48)	368 (43)
Telefonski vođen KPR	16 (1,9)	42 (4,9)
Svedok prisutan	388 (45,5)	363 (42,5)
Inicijalni ritam za isporuku šoka	103 (12,0)	284 (33,2)
ROSC	76 (8,9)	99 (11,6)

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Prilozi (tabele, grafikoni, sheme i fotografije)

2.1. Tabele, grafikoni i sheme dostavljaju se na posebnim stranama, u crno-beloj tehnici, u formatu koji obezbeđuje da i pri smanjenju na razmere za štampu ostanu jasni i čitljivi. Upotreba skraćenica u tekstu priloga dozvoljava se samo izuzetno, uz obaveznu legendu. Prilozi se označavaju zasebnim arapskim brojevima, prema redosledu navodenja u tekstu.
2.2. Tabela se kuca dvostrukim proredom, uključujući naslov, zaglavlja kolona i redove, sa tekstom na srpskom i engleskom jeziku, te je savetno da ga ima što manje. Redni broj i naslov pišu se iznad, a objašnjenja ispod, na srpskom i engleskom jeziku.
2.3 Grafikoni i sheme izraduju se tušem ili štampaju s visokom rezolucijom, na crtaćem ili paus papiru, sa tekstom na srpskom i engleskom jeziku. Redni broj, naslovi i legende kucaju se na posebnoj strani, dvostrukom proredom, na srpskom i engleskom jeziku
2.4. Fotografije, u crno-beloj tehnici, izrađuju se na kvalitetnoj, sjajnoj hartiji sa oštrim konturama. Fotografije osoba moraju prikriti njihov identitet, ili se mora dostaviti pismena saglasnost za objavljivanje. Mikrofotografije moraju imati markere skale. Redni broj, naslov i legenda kucaju se na posebnoj strani, na srpskom i engleskom jeziku, a identifikacija se vrsi pomoću nalepnice na poleđini na kojoj se grafitnom olovkom ispiše vrsta i broj priloga, ime i prezime prvog autora i početne reči naslova rada, a orijentacija (gore, dole) označava se vertikalno usmerenom strelicom.

Literatura

Literatura se u tekstu označava arapskim brojevima u uglastoj zagradi, prema redosledu pojavljivanja, kako se navodi i u popisu citirane literature. Za naslove časopisa koristiti skraćenice prema Index Medicusu (List of Journals Indexed). Srpski časopisi koji se ne indeksiraju u ovoj publikaciji skraćuju se na osnovu Liste skraćenih naslova Srpskih serijskih publikacija. Vankuverska pravila precizno određuju redosled podataka i znake interpunkcije kojima se oni odvajaju, kako je u nastavku dato u pojedinim primerima. Navode se svi autori, a ukoliko ih je preko šest, navesti prvih šest i dodati "et al".

Članci u časopisima:

1. Standardni članak: Goate AM, Haynes AR, Owen MJ, Farrall M, James LA, Lai LY, et al. Predisposing locus for Alzheimer's disease on chromosome 21. Lancet 1989;1:352-5.
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4. Volumen sa suplementom: Magni F, Rossoni G, Berti F. BN-52021 protects guinea pig from heart anaphylaxis. Pharmacol Res Commun 1988;20 Suppl 5:75-8.
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7. Knjige i druge monografije:
8. Jedan ili više autora: Eisen HN. Immunology: an introduction to molecular and cellular principles of the immune response. 5th ed. New York: Harper and Row, 1974:406.
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