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ORIGINAL ARTICLE

A conflict choice of treatment during defibrillation in cardiopulmonary resuscitation: Lidocaine, amiodarone or both? A retrospective study

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ABSTRACT

Objective: Cardiopulmonary arrest is considered to be an unpredicted event leading to sudden death. The primary purpose of the study is to investigate the effects of antiarrhythmic drugs during defibrillation within cardiopulmonary resuscitation (d-CPR) on survival outcomes.

Materials and Methods: The antiarrhythmic drug treatment during d-CPR management in our hospital from 2015 to 2022 were evaluated retrospectively. Demographic information, and details related to resuscitation were obtained from the "Cardiopulmonary Resuscitation and Code Blue Forms". According to inclusion criteria, from 898 patient data 135 were included. The treatment of anti-arrhythmic drugs administered during d-CPR management were lidocaine, amiodarone, or amiodarone&lidocaine together. Data recorded related to the present study were evaluated primarily according to the return of spontaneous circulation (ROSC) and survival outcomes.

Results: The mean cardiopulmonary resuscitation duration was 31.82±22.37 minutes in patients with ROSC and 42.40±9.28 minutes in non-ROSC, $p<0.01$. Amiodarone administration during d-CPR was the highest preffered treatment from 2015 to 2022, when compared with the usage of amiodarone&lidocaine together (14.1%), $p<0.01$. However the administration of lidocaine during d-CPR (39.3% of all) appered to be performed before 2020 in our hospital. Additionally amiodarone revealed a positive effect on systolic blood pressure and mean arterial pressure in ROSC patients ($p=0.02$, $p=0.04$ respectively), while the choice of antiarrhythmic drug treatment during d-CPR management showed no significant difference on survival status.

Conclusion: The observed ROSC was 42.2%. The choice of antiarrhythmic drug treatment during d-CPR management showed no significant difference on survival status, although amiodarone revealed a positive effect on systolic blood pressure and mean arterial pressure in the patients with ROSC.

Keywords: cardiopulmonary resuscitation, return of spontaneous circulation, lidocaine, amiodarone, defibrillation.

INTRODUCTION

Cardiac arrest (CA) is defined as an unexpected event that results in sudden death [1]. There are 17 million deaths per year in the world and sudden CA, approximately 25.0% [2]. There are around 200,000 in hospital CA each year in the United States with survival rates of 24% [3].

The most curable cause of CA is pulseless ventricular tachycardia or ventricular fibrillation which can be treated via defibrillation within cardiopulmonary resuscitation (d-CPR) [4]. The critical factors affecting survival in CA include early recognition, early cardiopulmonary resuscitation (CPR), and rapid defibrillation [5]. Defibrillation and external chest compression are critical procedures in the early resuscitation response, and each must come at the expense of the other [6].

Antiarrhythmic medications may play a role in ventricular fibrillation and pulseless ventricular tachycardia if defibrillators fail to achieve return of spontaneous circulation (ROSC) [7]. According to the American Heart Association guidelines published in 2015, amiodarone with lidocaine can be used, as an alternative to amiodarone alone, in adults unresponsive to CPR, defibrillation, or vasopressor therapy [8]. It was demonstrated in a recent review and meta-analysis that amiodarone and lidocaine showed increased survival to hospital admission compared to placebo [9]. Because CPR guidelines are periodically reviewed and revised based on the latest research evidence, it is crucial to practice the recent recommended information. In 2020 AHA published a new guideline for CPR, recommending the same practice, while the recommended drugs were either amiodarone or lidocaine [10].

The aim of this study was to assess the impact of administering amiodarone, lidocaine, or a combination of both antiarrhythmic drugs during d-CPR on survival and survival outcomes.

MATERIALS AND METHODS

Before initiating the study, the study protocol received approval from the ethics committee at Istinye University Hospital (Decision date: 01/02/2023; No: 2/2023.K-48). The conduct of this study adhered to the principles outlined in the Declaration of Helsinki.

We conducted a retrospective evaluation of adult patients from 01/01/2015 to 31/12/2022 who underwent d-CPR management, regardless of etiology. Demographic information of the patients: age, gender, diagnosis, possible causes, and details related to resuscitation: location [emencency room (ER), general intensive care unit (GICU), coronary intensive care unit (CICU), surgery intensive care unit (SICU) and ward], time of CPR duration, administered antiarrhythmic drugs, vital function outcomes (blood pressure, heart rate, SpO_2), and survival status (ROSC, non-ROSC) were obtained from the "Cardiopulmonary Resuscitation and Code Blue Forms". Patients with missing data and death on arrival (DOA) upon admission were excluded. Only 135 patients match the inclusion criteria of defibrillation management within CPR out of 898 Cardiopulmonary Resuscitation and Code Blue Forms analyzed. ROSC was defined as sustaining circulation for more than 24 hours and was determined by the ICU team members and noted on the form.

The primary aim of this study was to assess the impact of administering amiodarone, lidocaine, or a combination of both antiarrhythmic drugs during d-CPR on survival (ROCS or non-ROCS).

The seconder aims of this study were to assess the total CPR duration, the patients's diagnosis and possible causes, location of CPR management, the vital functions (systolic blood pressure, diastolic blood pressure, mean arterial pressure, heart rate, and SpO_2).

Statistical Analysis

Statistical analysis of this study was performed using the SPSS 26.0 (Statistical Package for Social Sciences, IBM Inc., Armonk, NY, USA) statistical software. Categorical variables are given as frequencies (number, percentage), while numerical variables are expressed as descriptive statistics (mean, standard deviation). The normality of the numerical variables was examined the kurtosis and skewness. Differences between two independent groups were analyzed using the Independent Sample T-Test or Mann Whitney U test, and differences between more than two

independent groups were analyzed using One-Way Analysis of Variance (ANOVA) or Kruskal Wallis. The relationships between groups were interpreted using Chi-square analysis and Fisher's Exact test. The one sample outcome comparison related to groups was analyzed with one-sample chi-square test. $p<0.05$ values were considered statistically significant.

RESULTS

A total of 135 patients were enrolled in this study [57 (42.2%) ROSC, and 78 (57.8%) non-ROSC]. There was no statistical significance according to age between gender (66.41±12.8 male and 66.88±15.42 female) or between gender, and date related to survival status ($p>0.05$). However, the mean ages of the non-ROSC patients were significantly higher than the patients who had ROSC (68.65±12.58, and 63.75±14.96 years, respectively, $p=0.04$). The mean CPR duration of 135 patients was 37.93±16.91 minutes. The mean CPR duration of the ROSC patients was 31.83±22.37 minutes, while it was 42.40±9.28 minutes in the non-ROSC. Statistical evaluation showed that, the CPR duration of the non-ROSC patients was significantly higher than the ROSC patients (mean rank: 83.15 and 47.26, respectively) ($p<0.01$) (Table 1).

The patients's diagnosis at the time of CPR, and possible causes of arrest were shown briefly in Table 1. Patients' diagnoses and possible causes of arrest were evaluated statistically after eliminating the unknown ones (14 of 135) as cardiac or respiratory arrest, and cardiac or non-cardiac possible causes. 30.6% of the 121 patients had ROSC diagnosed as cardiac arrest (100 / 82.6%) and 9.9% of them had ROSC diagnosed as respiratory arrest (21 / 17.4%).

In total, 95 patients were diagnosed with possible cardiac causes and 26 patients were diagnosed as possible non-cardiac causes. There was no statistical significance found related to survival according to diagnosis and possible causes ($p>0.05$) as shown in Table 1.

However, the survival status evaluation related to the location of CPR management was statistically significant ($p<0.01$), with the highest ROSC rate of CICU with 12 patients out of 12, and the lowest ROSC rates were in the GICU, SICU, and ward with 0 out of 5, 0 out of 4, and 0 out of 3. Since the highest and the lowest ROSC rates in those locations to the total of 135 evaluated patients in the study was 8.9% in CICU, and 8.9% in GICU, SICU, and ward total, we decided to evaluate the location of the patients as ER and non-ER according to survival status. There were no significant differences found statistically ($p>0.05$) (Table 1).

Drug utilization choice during d-CPR management is evaluated in 135 patients according to the location of CPR management, survival status, the year of the CPR management that was done (before 2020, and from 2020 to 2022), and in 121 patients according to the diagnosis, possible causes are briefly shown in Table 2. Evaluation related to the drug utilization choice in d-CPR management showed statistical significance ($p<0.01$), since the lowest choice of the drug administration was the usage of the drugs together (amiodarone & lidocaine) with 14.1%, while amiodarone alone was the most chosen drug with 63 (46.7%) followed by lidocaine alone with 53 (39.3%). The evaluation of the location of CPR management related to the drugs' choice during d-CPR was not statistically significant neither directly to the location nor ER vs non-ER comparison as shown in Table 2. However, there was a statistical significance according to the drugs' utilization in ER ($p>0.01$, one-sample Chi-Square test). In ER, utilization of amiodarone alone was the highest choice with 48.6% followed by lidocaine alone at 37.8%, and both drugs in the same patient with 13.5% (Table 2).

Although the rates of drug administration choice according to years "before 2020" to "from 2020 to 2022" presented differences as 25.9% to 20.7% in amiodarone alone, 17.8% to 21.5% in lidocaine alone, and 5.2% to 8.9% in amiodarone&lidocaine usage together, according to statistical evaluation, there was no statistical difference ($p>0.05$). However the evaluation of drug choice related to years separately before 2020, and from 2020 to 2022 showed statistical significance, $p<0.01$ and $p=0.02$ respectively. The evaluation revealed that the usage of both amiodarone and lidocaine together in d-CPR management was the least chosen one from 2015 to 2022.

The statistical evaluation of drug utilization choice in d-CPR management evaluated in 121 patients according to the diagnosis (cardiac arrest & respiratory arrest), and possible causes (cardiac causes & non-cardiac causes) revealed

Table 1. Demographic and clinical data of the patients according to survival status

		ROSC	Non-ROSC	Total	p
Patients (n / %)		57 / 42.2%	78 / 57.8%	135 / 100%	>0.05^{os-c}
Date (n / %)					
< 2020		30 / 22.2%	36 / 26.7%	66 / 48.9%	> 0.05^{c}
≥2020		27 / 20%	42 / 31.1%	69 / 51.1%	
Age (mean±SD)		63.8 ± 15.0	68.7 ± 12.8	66.6 ± 13.8	**0.04^{t}**
Gender (n / %)					
Female		21 / 15.6%	30 / 22.2%	51 / 37.8%	> 0.05^{c}
Male		36 / 26.6%	48 / 35.6%	84 / 62.2%	
Diagnosis (n / %)					
Cardiac Arrest		37 / 30.6%	63 / 52.1%	100 / 82.6%	>0.05^{c}
Respiratory Arrest		12 / 9.9%	9 / 7.4%	21 / 17.4%	
Unknown*		8	6	14	
Possible causes (n / %)					
Cardiac causes (95 / 78.5%)	MI	29 / 24%	31 / 25.6%	60 / 49.6%	>0.05^{c}
	Cardiac def	7 / 5.8%	26 / 21.5%	33 / 27.3%	
	Hypotension	1 / 0.8%	0	1 / 0.8%	
	Aort anev	0	1 / 0.8%	1 / 0.8%	
Non-cardiac causes (26 / 21.5%)	Respiratory failure	11 / 9.2%	5 / 4.1%	16 / 13.3%	
	Suicide	0	1 / 0.8%	1 / 0.8%	
	Tbc- pneumonia	0	1 / 0.8%	1 / 0.8%	
	Cancer	1 / 0.8%	3 / 2.5%	4 / 3.3%	
	Metabolic causes	0	4 / 3.3%	4 / 3.3%	
Unknown*		8	6	14	
CPR Location (n / %)					
ER (111 / 82.2%)	ER	45 / 33.3%	66 / 48.9%	111 / 82.2%	>0,05^{c}
Non-ER (24 / 17.8%)	GICU	0	5 / 3.7%	5 / 3.7%	
	CICU	12 / 8.9%	0	12 / 8.9%	
	Ward	0	3 / 2.2%	3 / 2.2%	
	SICU	0	4 / 3%	4 / 3%	
CPR duration (min) (mean rank)		47.26	83.15		**<0.01^{m}**
Antiarrhythmic drugs (n / %)					
Amiodarone		28 / 20.8%	35 / 25.9%	63 / 46.7%	>0.05^{c}
Lidocaine		20 / 14.8%	33 / 24.5%	53 / 39.3%	
Amiodarone &Lidocaine		9 / 6.7%	10 / 7.4%	19 / 14.1%	

n:number, ROSC: return of spontaneous circulation, MI: myocardial infarctus, def: deficiency, anev: anevrism, Tbc: tuberculosis, CPR: cardiopulmonary ressusitation, ER: emencency room, GICU: general intensive care unit, CICU: coronary intensive care unit, SICU: surgery intensive care unit min: minute, c: chi-square, t: independent t test, m: mann whitney u test, os-c: one sample chi-square test

*Unknown causes and diagnosis are eliminated.

no significant difference. However, the higher choice of amiodarone alone utilization in cardiac arrest diagnosis (45%) and cardiac possible causes (45.3%) revealed significant differences when compared with lidocaine alone (38% and 36.8% respectively) or usage of both which was the least chosen administration (17% and 17.9% respectively), as shown in Table 2.

The drug administration choice during d-CPR comparison on survival status showed no significant difference as informed before in Table 1, additionally, amiodarone alone, lidocaine alone, or the usage of both drugs during d-CPR presented no statistical difference according to survival status separately (p>0.05 at all) as shown in Table 2.

Table 2. Evaluation of drug utilization during defibrillation in CPR related to CPR location, date, possible causes, diagnosis, and survival status

		Amiodarone	Lidocaine	Amiodarone & Lidocaine	p
Patient (n / %)		63 / 46.7%	53 / 39.3%	19 / 14.1%	**<0.01** os-c
CPR Location (n / %)					
ER (111)		54 / 48.6%	42 / 37.8%	15 / 13.5%	**<0.01** os-c
ER (111 / 82.2%)		54 / 40.0%	42 / 31.1%	15 / 11.1%	
Non-ER (24 / 17.8%)	GICU	1 / 0.7%	4 / 3%	0	
	CICU	6 / 4.4%	2 / 1.5%	4 / 3%	>0.05c
	Ward	2 / 1.5%	1 / 0.7%	0	
	SICU	0	4 / 3%	0	
Date (n / %)					
< 2020 (66)		35 / 53%	24 / 36.4%	7 / 10.6%	**<0.01** os-c
≥2020 (69)		28 / 40.6%	29 / 42%	12 / 17.4%	**0.02** os-c
p		>0.05 os-c	>0.05 os-c	>0.05 os-c	
< 2020 (66/ 48.9%)		35 / 25.9%	24 / 17.8%	7 / 5.2%	>0.05c
≥2020 (69 / 51.1%)		28 / 20.7%	29 / 21.5%	12 / 8.9%	
Possible causes (n / %)					
Cardiac causes (95)		43 / 45.3%	35 / 36.8%	17 / 17.9%	**0.04** os-c
Non-cardiac causes (26)		16 / 61.5%	8 / 30.8%	2 / 7.7%	**0.03** os-c
Cardiac causes (95 / 78.5%)		43 / 35.5%	35 / 28.9%	17 / 14.1%	>0.05c
Non-cardiac causes (26 / 21.5%)		16 / 13.2%	8 / 6.6%	2 / 1.7%	
Unknown*		4	10	0	
Diagnosis (n / %)					
Cardiac Arrest (100)		45 / 45%	38 / 38%	17 / 17%	**0.002** os-c
Respiratory Arrest (21)		14 / 66.7%	5 / 23.8%	2 / 9.5%	**0.004** os-c
Cardiac Arrest (100 / 82.6%)		45 / 37.2%	38 / 31.4%	17 / 14.0%	>0.05c
Respiratory Arrest (21 /17.4%)		14 / 11.6%	5 / 4.1%	2 / 1.7%	
Unknown*		4	10	0	
Survival status (n / %)					
ROSC		28 / 20.7%	20 / 14.8%	9 / 6.7%	>0.05c
Non-ROSC		35 / 25.9%	33 /24.4%	10 / 7.4 %	
p		>0.05 os-c	>0.05 os-c	>0.05 os-c	

n:number, ROSC: return of spontaneous circulation, CPR: cardiopulmonary ressusitation, ER: emencency room, GICU: general intensive care unit, CICU: coronary intensive care unit, SICU: surgery intensive care unit min: minute,

c: chi-square test, os-c: one sample chi-square test

*Unknown causes and diagnosis are eliminated.

Afterward, the vital functions (systolic blood pressure, diastolic blood pressure, mean arterial pressure, heart rate, and SpO_2) of the 57 patients who had ROSC were evaluated according to the drugs administrated during d-CPR management. Firstly, to make sure if atropin utilization affected the overall heart rate or not in ROSC patients, we evaluated heart rate data under atropin usage. There were no significant difference was found (p>0.05). Additionally, adrenalin effect to the blood pressure of the ROSC patients was not evaluated since it was given to all of the patients in the study. Therefore, evaluation of the vital functions related to drug utilization in ROSC patients revealed that there were no significant differences according to heath rate, SpO_2, and diastolic blood pressure (p>0,05) (Table 3). However, we found that the patients' systolic blood pressure and mean arterial blood pressure (MAP) related to drug utilization during d-CPR management were significantly different when compared with drug utilization. Systolic blood pressure and MAP were found to be higher depending on the usage of amiodarone alone (Systolic blood pressure mean±SD:

Table 3. Evaluation of vital functions in ROSC patients according to drug utilization during defibrillation in CPR including age, gender, date, CPR duration

	Amiodarone	Lidocaine	Amiodarone & Lidocaine	p
Patient (n / %)	28 / 49.1%	20 / 35.1%	9 / 15.8%	**0.08^{os-c}**
Age (mean±SD)	61.6±13.8	63.8±17.2	70.3±12.5	>0.05^{owa}
Gender (n / %)				
Female (21 / 36.8%)	14 / 24.6%	4 / 7%	3 / 5.3%	>0.05^{c}
Male (36 / 63.2%)	14 / 24.6%	16 / 28.1%	6 / 10.5%	
Date (n / %)				
< 2020 (30 / 52.6%)	16 / 28.1%	9 / 15.8%	5 / 8.8%	>0.05c
≥2020 (27 / 47.4)	12 / 21.1%	11 / 19.3%	4 / 7%	
p	>0.05 $^{os-c}$	>0.05 $^{os-c}$	>0.05 $^{os-c}$	
CPR duration (min) (mean±SD)	34.61±29.66	28.65±11.81	30.22±12.36	>0.05^{kw}
Heart rate after ROSC (mean±SD)	100.93±21.53	106.20±28.67	105.0±39.07	>0.05^{owa}
SpO_2 after ROSC (mean±SD)	93.9±2.04	93.4±3.98	94.3±2.3	>0.05^{kw}
Systolic BP	113.71±32.73	109.70±27.20	85.00±13.27	**0.02^{kw}**
Diastolic BP	66.79±20.10	64.80±18.16	50.78±9.08	>0.05^{kw}
Map	82,43±23,46	79.77±20.07	62.19±10.07	**0.04^{kw}**

n:number, SD: standard derivation, ROSC: return of spontaneous circulation, CPR: cardiopulmonary ressusitation, min: minute, SpO_2: saturation, BP: blood pressure, Map: mean arterial pressure, c: chi-square, os-c: one sample chi-square test, owa: one way anova test, kw: kruskal wallis test

113.71±32.73, MAP mean±SD: 82,43±23,46) when compared with the lidocaine alone usage, and both amiodarone&lidocaine usage (Systolic blood pressure mean±SD: 109.70±27.20 and 85.00±13.27, MAP mean±SD: 79.77±20.07 and 62.19±10.07, respectively)(p=0.02, and p=0.04, respectively), as shown in Table 3. Additionally, we revealed that in the patients who had ROSC amiodarone alone administration (48.1%) was significantly higher when compared to lidocaine alone (35.1%) or both amiodarone&lidocaine (15.8%) utilization, p=0.008.

DISCUSSION

The most important finding of this study is that the choice of amiodarone administration during d-CPR was the highest one when compared with lidocaine alone or amiodarone & lidocaine together in the patients who had ROSC, and in the total of the patients who had included the study. Additionally, amiodarone usage had a significant positive effect on systolic blood pressure and mean arterial pressure in the patients who had ROSC. However, this study revealed that the rate of drug utilization choice during d-CPR showed no significant difference, and amiodarone alone, lidocaine alone, or the usage of both drugs during d-CPR presented no positive effect on survival separately.

In this study, we examined the demographic and clinical features of patients receiving d-CPR. In addition, we compared the same parameters according to the antiarrhythmic drugs administered during d-CPR management. The age of non-ROSC patients who had CPR due to cardiac arrest was reported as 68 years in the literature [11]. In a study performed by Arac et al., the mean age was statistically significantly greater among nonsurvivors [12]. In our study, the mean age of non-ROSC patients was 68.7±12.8 which was significantly higher than patients who had ROSC. Additionally, in the same study by Arac et al., 64.0% of the non-survivors were male and 36.0% were female [12]. In our study, 62.2% of all patients were male and 37.8% were female. In the comparison of age with survival status from 78 non-ROSC patients 61.5% of them were male and 38.5% were female. Our results were consistent with the literature.

The duration of CPR is an important factor associated with outcomes. In a study by Esen et al., the mean CPR duration was reported as 32.3±13.5 minutes, additionally, Acar et al. showed that the rate of CPR duration of more than 21 minutes was 60% in both survivors and non-survivors [13,14]. The ROSC comparison is also an important factor in the studies to assess the success of CPR management. In a study by Arac et al., the survival rate was 31.82% [12]. Kashiura indicated that the

rate of ROSC was 50.5%, and in another study, the rate of ROSC was reported as 51% by Rohlin et al., [15,16]. In the present study, the rate of ROSC was 42.2%, while the mean CPR duration was found as 31.8±22.4 minutes in the patients who had ROSC, and 42.4±9.3 minutes in the non-survivors. In this respect, our outcomes were close to the literature reported above.

Assessment of diagnosis of CPR as respiratory or cardiac arrest, and possible causes of arrest is essential. In the study of Esen et al., the most commonly encountered cause of CPR application was found as cardiopulmonary arrest at 79.6% [13]. In our study, the most common diagnosis of the patients who had CPR was cardiac arrest (82.6%) followed by respiratory arrest (17.4%). The highest possible cause was myocardial infarction with a rate of 49.6% of all possible causes within the cardiac possible causes (78.5%). The highest rate of patients with respiratory arrest was respiratory failure with 13.3% within non-cardiac possible causes. Our different results could be attributed to our limited study population.

It has been reported that the patients could have benefited from the d-CPR management when the anti-arrhythmic drugs were given initially [17]. In a study by Arac et al., amiodaron was given in 12.7% of the CPR patients, while lidocaine was not used [12]. Amiodarone was the only drug which was recommended in the pre-2020 AHA CPR guidelines for administration during defibrillations in CPR, while in 2020 AHA decided to widen the recommendation of antiarrhythmic drug administration during d-CPR management, and added lidocaine as another antiarrhythmic drug which has already been utilized in d-CPR managements in our hospital since 2015 [8,10]. Therefore we were able to compare the outcomes of the patients to whom d-CPR was performed, and to whom different antiarrhythmic drugs were administered. In our study, amiodarone alone was the most chosen drug in d-CPR with statistical significance. In this respect, our outcomes were close to the trial reported above. In addition, according to our vital outcome data evaluations, systolic blood pressure and mean arterial pressure were significantly higher in the amiodarone-administrated ROSC patients. Though there were no studies published in the literature about vital outcomes like our study according to the best of our knowledge, there was a study published related to amiodarone, and lidocaine therapy among adult patients with in-hospital cardiac arrest comparing the rates of ROSC, reporting that lidocaine has a positive significant effect on ROSC [18]. Our study results showed no significant difference according to ROSC in comparison with amiodarone, lidocaine, or amiodarone&lidocaine treatment during d-CPR management. However, we also revealed that the highest ROSC score was in the CICU with %100(12/12) where the choice of lidocaine administration was nearly the lowest (%1.5) of all the locations in which d-CPR was managed. Our different results could be attributed to our limited study population. In this respect, we think that there is still a need for more trials in this field of medicine about the success of CPR management.

Study Limitations

The major limitations of this study include its retrospective design and the relatively small sample size. In addition, the lack of recordings in the Cardiopulmonary Resuscitation and Code Blue Forms that the data of the trials collected lessen the quality of the evaluation of CPR success, like as the drugs' administration doses, the drugs' administration time, the etCO2 outcome, or the arterial blood gas sample outcomes. Since similar studies were limited in the literature, we could not effectively compare our findings. Nevertheless, we think that our trial will lead to further comprehensive studies with a larger patient population.

CONCLUSION

The mean age of the non-survivors was significantly higher than survivors receiving d-CRP. The rate of ROSC was 42.22%. However only amiodarone usage was recommended in the pre-2020 AHA CPR guidelines, and lidocaine had been utilized in our hospital. Lidocaine was administered in 53 (39.26%) patients during d-CPR management. Although systolic blood pressure and mean arterial pressure were significantly higher statistically in the amiodarone than the both drugs' (amiodarone & lidocaine) administration, there were no significant differences between ROSC. Further studies are warranted to investigate CPR parameters in detail.

Author contribution

Study conception and design: EB; data collection: EB; analysis and interpretation of results: EB; draft manuscript preparation: EB. The author reviewed the results and approved the final version of the manuscript.

Ethical approval

The study was approved by the Clinical Research Ethics Committee of Istinye University (Decision date: 01/02/2023; No: 2/2023.K-48).

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Conflict of interest

The authors declare that there is no conflict of interest.

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