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Comparison of use and role of adrenaline and amiodarone in cardiac arrest: Case of emergency center in Kosovo

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ABSTRACT

Objective: To investigate application of cardiopulmonary resuscitation (CPR) measures within the golden minutes in Europe. **Methods:** The collected data belong to the patients with cardiac arrest that have been recorded in patients' protocol logbook at the Emergency Clinic. During the 2010-2011 in the Emergency Center of the CUCK in Prishtina have been treated a total of 269 patients with cardiac arrest, of whom 159 or 59.1% have been treated in 2010, and 110 patients or 40.9% in 2011. Cardiac arrest cases were present during all days of the week, but most frequently cases have been reported on Monday with 32.0% of cases, and on Friday with 24.5% of cases. All patients with cardiac arrest have been treated with physiological solution. **Results:** In 245 or 91.1% patients adrenaline has been applied; in 64 or 23.8% amiodarone has been applied; in 12 or 4.5% cases atropine has been applied, 11 or 4.1% of cases were treated with $NaHCO_3$; 7 or 2.6% of cases were treated with lidocaine; and 6 or 2.2% of cases were treated with dopamine. All survivors from cardiac arrest have received appropriate medical assistance within 10 minutes from attack, which implies that if cardiac arrest occurs near an health care institution (with an opportunity to provide the emergent health care) the rate of survival is higher. **Conclusions:** Anti-arrhythmic drugs as with vasopressors, the evidence that anti-arrhythmic drugs are of benefit in cardiac is limited. No anti-arrhythmic drug given during human cardiac arrest has been shown to increase survival to hospital discharge, although amiodarone has been shown to increase survival to hospital admission after shock-refractory VF/VT. There are no data on the use of amiodarone for shock-refractory VF/VT when single shocks are used. Despite the lack of human long-term outcome data, the balance of evidence is in favour of the use of some anti-arrhythmic drugs for the management of arrhythmias in cardiac arrest.

1. Introduction

The Emergency Centre is the part of the University Clinical Centre of Kosova and is the reference Emergency Centre for all cities of Kosovo. The center is visited annually by 40 000 patients from which 8 000 are admitted to emergency for further treatment and analysis.

There are many cases that end up that are not emergent but since they look for help the doctors ethics cannot let them untreated. One of the reasons for such high flux of patients is the lack of secondary medicine hospital in Prishtina capital of Kosovo.

If we focus only in cardiac arrest cases, these in Emergency Center in Kosovo are increasing with time. These cases in the bigger percentage end up with exitus including approximately 90% of prehospital cases and 60% of hospitalized cases.

The main objective is to assess the role of adrenaline and amiodarone use in cardiac arrest whether their use has helped to reduce of the percentage of death cases[1,3].

This is a serious indicator that we have to carefully and with competence deal with these cases. The big percentage of cases that end up with exitus which is 90% is much higher than the official percentage in the USA or EU. This is one of the indicators that we in Kosovo need to work on to decrease it.

Another issue is the use of the latest protocols of treatment and the availability of medicinal products in the right time (there is lack of availability for full list of essential list in Kosovo).

And the third indicator is the maintenance of the survivals

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after the cardiac arrest to increase their life expectancy years which is another indicator that in Kosovo is below the official statistics of USA and EU[1,5,8,9].

Amiodarone may be considered for VF or pulseless VT unresponsive to CPR, defibrillation, and a vasopressor therapy (Class IIb, LOE B). An initial dose of 300 mg IV/IO can be followed by 1 limited experience with amiodarone given by this route. Cardiac arrest centres There is wide variation in dose of 150 mg IV/IO. Although anecdotally administered IO without known adverse effects, there is patient survival rates among hospitals caring for patients after resuscitation from cardiac arrest[1,3].

2. Materials and methods

The research it is done in Emergency Centre of Kosovo during 2010 and 2011. The main data were excluded from patient records and we have chosen 269 patients with cardiac arrest (only cases of cardiac arrest with cardiac origin). Also there has been done a comparison with cases presented in journals and other papers retrieved from databases.

3. Results

The total number of patients that are considered for this research were 269 in Figure 1. According to the gender there is a significant higher number of females with cardiac arrest Table 1 or their percentage shown in Figure 1.

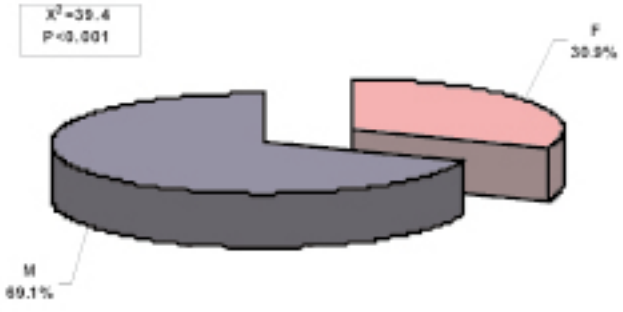

Figure 1. Structure of patients with cardiac arrest.

Median age of patients was 56.7 years old (with SD±16.0 years). The youngest patient was less than one year old and the oldest one was 92 years old.

The median age of female patients was 55.2 while the youngest one was 20 years old and the oldest one was 92. From the male patients the median age was 57.3, the youngest one was less than one and the oldest one was 87 years old Table 2.

Another parameter analysed is the day of the week when the number of cases with cardiac arrest was higher. From the Table 3 we see that on Mondays with 32% of the cases their number is significantly higher than other days. Another day that the number is high is Friday with 24.5% of cases.

Table 2
Some of the parameters according to the gender.

Age (year)	Age		Total
	F	M	
n	83	186	269
Mesatarja	55.2	57.3	56.7
DS	14.6	16.6	16.0
Min	20.0	1.0	1.0
Max	92.0	87.0	92.0
T-test, *P*-value	*T*=0.99, *P*>0.05		

Table 3
Cardiac arrest cases according to the day of the week.

Day	*n*	%
Monday	86	32.0
Tuesday	25	9.3
Wednesday	34	12.6
Thursday	29	10.8
Friday	66	24.5
Saturday	26	9.7
Sunday	23	8.6
Total	269	100.0

To all patients is given sodium chloride solution 0.9%. While to 245 patient or 91.1% is applied Adrenaline as a drug of choice of cases with caridac arrest. At 23.8% of cases is given Amiodarone, at 14.5% Atropine, at 4.1% $NaHCO_3$, at 2.6% lidocaine and at 2.2% is given Dopamine (Figure 2).

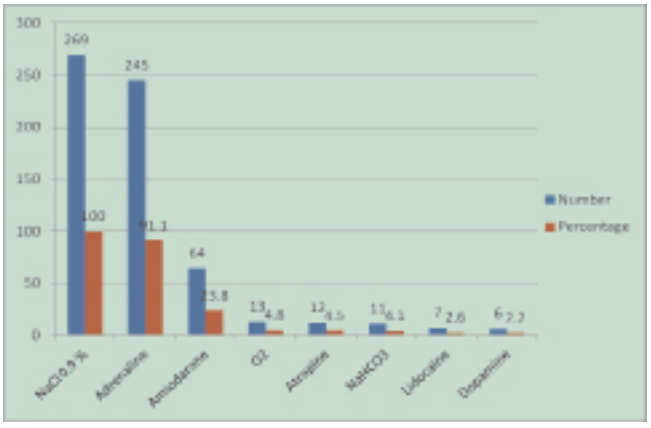

Figure 2. Therapy applied to patients with cardiac arest.

There is indirect evidence that regional cardiac systems of care improve outcome after STEMI.The implication from all these data is that specialist cardiac arrest centres and systems of care may be effective but direct evidence is awaited. When treating VF/VT cardiac arrest, adrenaline 1 mg is given once chest have restarted after the third shock and then every 3-5 min (during alternate cycles of CPR). In the 2005 Guidelines, adrenaline was just before the third shock. This subtle change in the timing of administration is to separate the timing of drug delivery from attempted defibrillation. It is hoped that this will result in more efficient shock delivery and less interruption in chest

compressions. Amiodarone 300 mg is also given after the third shock[2,7,6].

4. Discussion

There is no evidence that any antiarrhythmic drug given routinely during human cardiac arrest increases survival to hospital discharge. Amiodarone, however, has been shown to increase short-term survival to hospital admission We have concluded that if the therapy is given within 10 min after cardiac arrest the percentage of survival could much higher. We did not have any survived which have came ten minutes after the cardiac arrest in the center. If we focus only in cardiac arrest cases, these in Emergency Center in Kosovo are increasing with time. These cases in the bigger percentage end up with exitus including approximately 90% of prehospital cases and 60% of hospitalized cases. The use of adrenaline every 3-5 min in a dose 1mg IV/IO shows good results while the amiodarone cases had no significantly increase in the overall percentage of survival[1]. Although anecdotally administered IO without known adverse effects, there is limited experience with amiodarone given by this route. On the basis of expert consensus, if VF/VT persists, give amiodarone 300 mg by bolus injection (flushed with 20 mL of 0.9% sodium chloride or 5% dextrose)177 after the third shock. A further dose of 150 mg may be given for recurrent or refractory VF/VT, followed by an infusion of 900 mg over 24 h. Lidocaine 1 mg/kg may be used as an alternative if amiodarone is not available, but do not give lidocaine if amiodarone has been given already. The research shows that if the patient is able to be sent to the center within 10 min from the cardiac arrest the chance of survival is higher[3,11-13]. The recommendation from this research is that the relevant authorities has to take decisions to make proper trainings to the medical staff working not only in emergency centre but as well other family centers for the treatment of cardiac arrest with a proper dosage of adrenaline and other drugs needed, which would increase the percentage of survival. Three initial stacked shocks are given only in very specific circumstances-in the cardiac catheter laboratory, in patients who have just had cardiac surgery, and those who have a witnessed monitored arrest and are already connected to a manual defibrillator. These 3 initial stacked shocks should be considered as the first shock in the ALS algorithm and both adrenaline and amiodarone should be given after a further 2 defibrillation attempts (i.e. delayed until after the fifth shock) [1,3,13].

Conflict of interest statement

The authors declare no conflict of interest.

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