

Gender differences in presentation and outcome of out-of-hospital cardiac arrest

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Introduction

Several studies suggest gender difference in presentation and treatment of Out-of-Hospital Cardiac Arrest (OHCA). Previous studies have consistently found more favorable arrest characteristics in men, including younger age and a higher frequency of initial shockable rhythm, witnessed arrest and bystander cardiopulmonary resuscitation (CPR). However, unknown is whether lay responders performance and outcome can significantly vary according to the victim's gender.

Purpose

We aimed to analyse the outcome of OHCA occurred in Swiss Canton Ticino according to the victim's gender.

Methods

We performed a retrospective analysis of prospectively collected data of OHCA since 1st of January 2005 to 31st of December 2017 in Swiss Canton Ticino. When a cardiac arrest is suspected, assisted triage and life support are dispatched and medical assistance is initiated until an ambulance arrives. The Emergency Medical Service (EMS) dispatcher send the ambulance and, in parallel, notifies the alert to the traditional first-responders (police officers and fire brigade), trained in Basic Life Support-Defibrillation (BLS-D) and equipped with an automatic external defibrillator (AED). If conditions are regarded as safe, the first responders (FR) are notified as well. The latter are mostly lay persons, but even off-duty healthcare providers.

Results

A total of 3623 patients, 1140 women (31 %) and 2493 men (69%), were included. OHCA in women occurred more often at home (72% versus 63%, respectively, $p < 0.001$) and less frequently it was witnessed (56% versus 63%, respectively, $p < 0.001$). Women were more likely to be older than men (median age 76 versus 69 years old, respectively, $p < 0.001$).

Demographic characteristics, overall survival, times of intervention of all OHCA (2005-2017), according to gender

	F (N=1130)	M (N= 2493)	P value
Age, median, [IQR]	76 [65-84]	69 [58-78]	<0.001
Etiology, n (%)			0.001
Cardiac	748 (66)	1846 (74)	
Trauma	37 (3)	173 (7)	
Drowning	8 (1)	23 (1)	
Respiratory	105 (9)	117 (7)	
Other non cardiac	177 (16)	254 (10)	
Unknown	55 (5)	80 (3)	
Location, n (%)			<0.001
Home	810 (72)	1494 (63)	
public	317 (28)	989(40)	
Witness, n (%)	639 (56)	1583 (63)	<0.001
Rhythm, n (%)			<0.001
Shockable	190 (17)	776 (32)	
PEA	337 (30)	613 (24)	
Asystole	528 (47)	969 (39)	
other	75 (6)	135 (5)	
BLS before EMS, N (%)	545 (56)	1277 (58)	0.431
Epinephrine administration, n (%)	712 (86)	1527 (84)	0.193
ROSC, N (%)	391 (35)	817 (33)	0.123
Times, median [IQR]			
Time to BLS before ambulance arrival	7 [5-10]	6 [5-9]	0.118
Time to EMS arrival	10 [7-14]	10 [7-14]	0.847
Time to ROSC	27 [19-36]	25 [20-35]	0.167
Survival at discharge, n (%)	57 (13)	263 (22)	0.001

First responders performance, times of intervention and outcome in OHCA victims presenting with shockable rhythms, according to gender

	F =116	M= 557	P value
Age, median [IQR]	71 [60-81]	67 [58-75]	<0.001
BLS before ambulance arrival, n (%)	79 (68)	383 (69)	0.746
Time to BLS, min, median [IQR]	7 [5-8]	6 [4-9]	0.604
FR defibrillation, n (%)	19 (12)	92 (22)	0.004
Time to AED use, min, median [IQR]	10 [8-14]	8 [5-11]	0.03
Time to EMS arrival, min, median [IQR]	10 [8-14]	10 [7-13]	0.181
Time to ROSC, min, median [IQR]	23 [17-32]	24 [18-31]	0.552
Survival at discharge, n (%)	33 (28)	210 (38)	0.01

FR: First responder, AED: automatic external defibrillator, ROSC: return of spontaneous circulation

In the subgroup of patients with a shockable rhythm, no gender differences were observed in CPR received by first responders before ambulance arrival.

Women were less frequently defibrillated by a first responder before ambulance arrival (12% versus 22%, $p 0.004$) and, therefore, median time to first shock was slightly prolonged in women respect to men (10 min [8-14] versus 8 min [6-11], respectively, $p 0.03$). Survival at discharge in women was significantly lower, even when the presenting rhythm was a VF or a VT.

Conclusions

In our experience, OHCA presentation and outcome significantly differs according to sex. Women presenting with a shockable rhythm had a lower survival compared to male patients due to different clinical presentation (more often occurring at home and unwitnessed) and to delayed time of defibrillation.