Journal Reading

Clinical paper

Long-term prognosis following resuscitation from out-of-hospital cardiac arrest: Role of aetiology and presenting arrest rhythm☆

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Resuscitation
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Introduction

- Long-term prognosis following resuscitation and hospital discharge remains limited.
- An important context.
- Which subgroup is worth to invest ?
  - Non-cardiac aetiology or non shockable rhythms
  - cardiac aetiology or shockable rhythms
- A population-based cohort investigation
- Compared prognosis according to arrest aetiology and initial arrest rhythm.

Methods

- Population
  - **>18y/o**
  - **Non-traumatic**, **OHCA** that were resuscitated and discharged alive
  - Between January 1, 2001 and December 31, 2009
  - Emergency medical service (EMS) system
    - 1.3 million
    - 2000 square miles

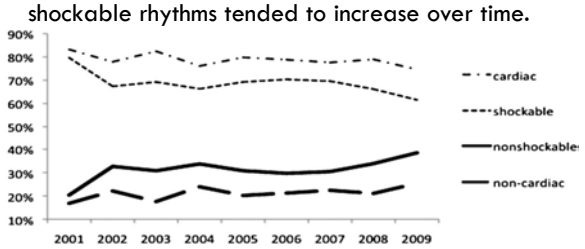
- EMS
  - Basic life support by firefighters (with EMT) with AED
  - Advanced life support by paramedics with…
  - Call to basic：5min；
    Advanced on-scene arrival：10 min
  - 14 hospitals with coronary catheterization laboratory and ICU

- Data Collection
  - Demographics, circumstances, presenting arrest rhythm, and care： according to Utstein Guidelines
  - Arrest aetiology, clinical conditions, care, and outcome
  - Presenting arrest rhythm was shockable or non-shockable： the defibrillator recording

Results

- OHCA：6742
- Not exclude：5958
- Discharged alive：1001
- Non-cardiac：210/1001
  - respiratory：86/210 – 41%
  - drug overdose：46/210 – 22%
- Non-shockable：313/1001

- The proportion of non-cardiac aetiology or non-shockable rhythms tended to increase over time.



- Discharged alive with non-cardiac aetiology and nonshockable arrest rhythm comprised 21% and 31%

	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
Total discharged alive from hospital	113	95	91	92	104	118	125	133	130	1001
Aetiology,n (%)										
Cardiac	95 (84)	75 (79)	75 (82)	70 (76)	83 (80)	93 (79)	97 (78)	105 (79)	98 (75)	791 (79)
Non-Cardiac	18 (16)	20 (21)	16 (18)	22 (24)	21 (20)	25 (21)	28 (22)	28 (21)	32 (25)	210 (21)
Initial Rhythm, n (%)										
Shockable	90 (80)	64 (67)	63 (69)	61 (66)	72 (69)	83 (70)	87 (70)	88 (66)	80 (62)	688 (69)
Non-Shockable	23 (20)	31 (33)	28 (31)	31 (34)	32 (31)	35 (30)	38 (30)	45 (34)	50 (38)	313 (31)

- Non-cardiac
  - be younger, be female, and have diabetes
  - less have coronary disease, have a witnessed or public setting arrest, or receive bystander CPR
- Non-shockable
  - be older, be female, and have diabetes
  - less have coronary disease, have a witnessed or public setting arrest, or receive bystander CPR

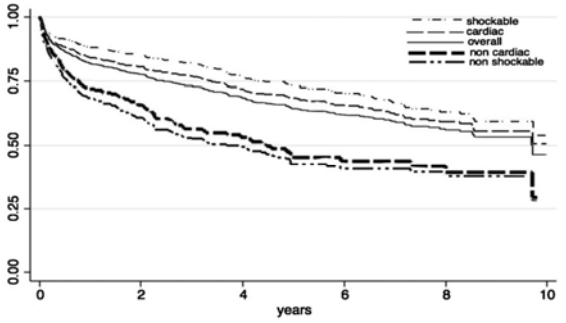
Table 1
Baseline characteristics according to aetiology and initial arrest rhythm.

	Overall N = 1001	Non cardiac cause N = 210 (21)	Cardiac cause N = 791 (79)	p-Value	Non- shockable N = 313 (31)	Shockable N = 688 (69)	p-Value
Male gender	691 (69)	110 (52)	581 (74)	<0.001	166 (53)	525 (76)	<0.001
Age, yrs, mean (SD)	61 (15)	58 (18)	62 (14)	<0.001	62 (17)	60 (14)	0.02
Hyperlipidaemia	389 (39)	56 (27)	333 (42)	<0.001	79 (25)	310 (45)	<0.001
Current smoking	274 (27)	55 (26)	219 (28)	0.67	76 (24)	198 (29)	0.14
Hypertension	585 (59)	118 (56)	467 (59)	0.46	191 (61)	394 (57)	0.26
Diabetes mellitus	286 (29)	77 (37)	209 (26)	0.003	124 (40)	162 (24)	<0.001
Coronary disease history	379 (38)	56 (27)	323 (41)	<0.001	108 (35)	271 (39)	0.14
Shockable initial rhythm	688 (69)	23 (11)	665 (84)	<0.001	–	–	–
Congestive heart failure/cardiomyopathy	244 (24)	44 (21)	200 (25)	0.19	92 (29)	152 (22)	0.01
Cardiac aetiology	791 (79)	–	–	–	126 (40)	665 (97)	<0.001
Witnessed	844 (85)	143 (68)	701 (89)	<0.001	216 (70)	628 (91)	<0.001
Bystander CPR	462 (47)	57 (27)	405 (51)	<0.001	97 (32)	365 (54)	<0.001
Arrest location							
Home	574 (58)	151 (72)	423 (54)	<0.001	219 (71)	355 (52)	<0.001
Public area	345 (35)	27 (13)	318 (41)		53 (17)	292 (43)	
Nursing home	78 (8)	31 (15)	47 (6)		38 (12)	40 (6)	
Time response, min (SD)	5 (2)	5 (2)	5 (2)	<0.001	5 (2)	5 (2)	0.002

- Median survival was 9.8 years
  - 1 year of 82%
  - 2 years of 78%
  - 3 years of 73%
  - 5 years of 64%

- Survival was lower：non-cardiac and non-shockable arrest rhythm

	1 year			5 years			10 years		
	Deaths	Person years	Survival	Deaths	Person years	Survival	Deaths	Person years	Survival
Overall	180	877	82 (80-84)	313	3063	64 (61-67)	348	3801	49 (42-56)
Non-cardiac	59	170	72 (65-78)	98	518	45 (37-53)	102	613	28 (11-49)
Cardiac	121	707	85 (82-87)	215	2545	69 (65-72)	246	3188	54 (47-61)
Non-shockable	99	245	69 (63-73)	157	737	43 (36-49)	162	877	30 (15-46)
Shockable	81	632	88 (86-90)	156	2326	74 (70-77)	186	2924	57 (49-64)



Discussion

- Non-cardiac aetiology and non-shockable rhythm had consistently poorer Utstein predictors.
  - less occur in a public setting, be witnessed, or receive bystander CPR, and longer EMS response interval.
  - increasing over time during the decade of study.

- Non-shockable compared to shockable arrest rhythm were more likely to be older, be female, and have diabetes
- Non-cardiac compared to cardiac aetiology were on average more likely to be younger, be female, and have diabetes
- But less likely to have coronary disease, have a witnessed or public setting arrest, or receive bystander CPR

- Non-cardiac and non-shockable groups should be considered in programmatic efforts of resuscitation.
  - Oxygenation and ventilation may be relatively more important.
- Limitation
  - Can`t evaluate prognosis according to the subtype of non-cardiac aetiology.
  - Did not assess functional status but rather simply described long-term survival.

Conclusion

- Non-shockable rhythm or non-cardiac aetiology comprises a substantial proportion.
- Long-term survival in these groups is less, nearly half are alive 5 years following hospital discharge.
- Continued efforts to improve resuscitation care for all patients with cardiac arrest including those with non-cardiac aetiology or non-shockable presenting rhythm.

THE END