EMS system in Osaka, Japan

Osaka Police Hospital , Emergency and Critical Care medical center
Osaka city medical control committee
Kyoto university Health services

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Presenter Disclosure Information

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Utstein Osaka project (Osaka prefectural government committee)

ACLS Osaka working group (Osaka medical Association)

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Introduction

- The history and system of EMS in Japan
- EMS systems in Osaka
  - General
  - Medical Control
  - EMS Research
  - Current Issues
  - Current Challenges
- Conclusion

The history of EMS systems in Japan

1948: Legislation related to
‘municipal fire service organization’ was executed.
(Fire defense headquarters were organized by cities, town and villages)

1963: Provision of emergency medical service by fire defense headquarters was made mandatory.

1991: Emergency Life-Saving Technicians (The most highly trained Prehospital emergency care providers: paramedic) based EMS system was started

The relationship between Fire defense headquarter and central agency

EMS Provider Levels

Emergency Life-Saving Technician : Paramedic

•The person who passed the national examination after receiving at least 2 year education at certificated school.

•The EMT who engaged in a first aid for more than five years or 2,000 hours
– passed the national examination after receiving at least 1 year education at certificated fire fighter's school.

Medical practice: Basic Life Support, First Aid

◆ 1991
1.Defibrillation with AED
2.IV lifeline and fluid administration
3.Airway maintenance with equipment

◆2004 : Endotracheal intubation

◆2006 : Adrenalin administration
(under on-line medical direction for only Cardiac Arrest patients)

Emergency Medical Technician: EMT

The person who finished 250-hour education in a firefighter's school

Medical practice: Basic Life Support, First Aid

→2010:

1, Epipen® for Anaphylaxis.

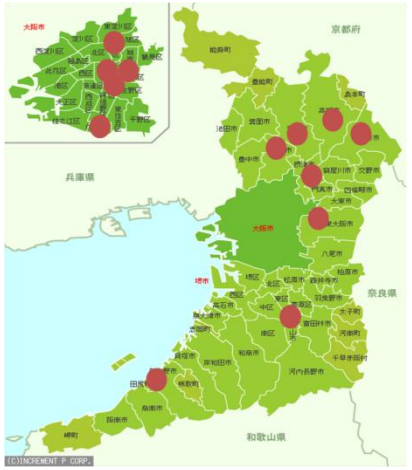
2, Blood sugar examination and administration of glucose for hypoglycemic attack case.

3, IV lifeline and fluid administration for non-cardiac arrest patients.

EMS System in Osaka - General

Osaka Prefecture

Population; 8.8million /1892Km^2
Urban, suburban and rural areas

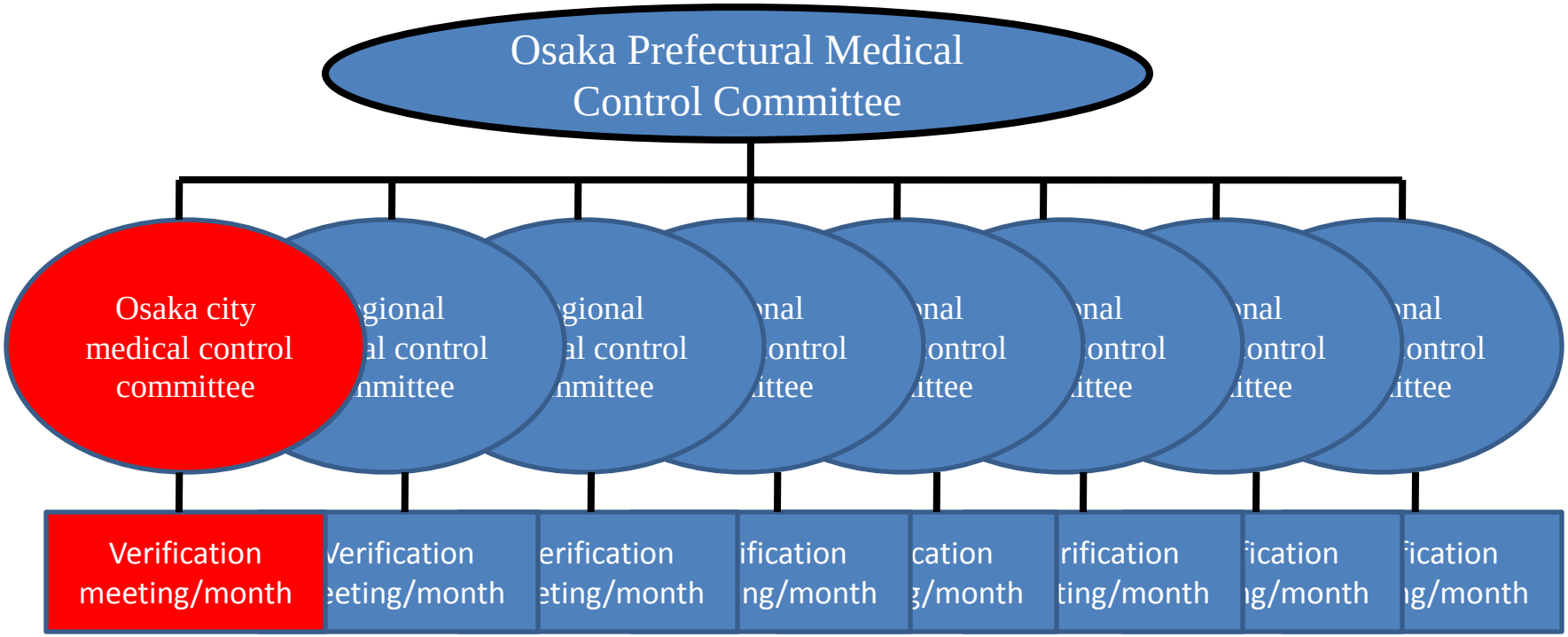


- 34 Fire defense headquarters(FDH: Fire Department)
  32 single tired , 2 two tired system (Hospital based & FDH based Doctor Car)
- Receiving hospital - Critical Care Center 13 hospitals
  Emergency hospitals 200 hospitals
- Fire first-response/Transporting - FDH's Ambulance
- Regional medical control (MC) committee specific differences

EMS System in Osaka –Medical Control

System:

- No medical director (full time and part time)
- Regional medical control committee: 8 blocked (Organized by MC charge hospital's doctor)



Number of missions and persons transported by ambulance

3.Ambulance emergencies

[1] Number of missions and persons transported

Ambulances went on a total of **197,366 missions** (a year-on-year increase of 3,998 cases), transporting a total of **161,251** (a year-on-year same of people).
Converted to a daily average, the figures reveal that ambulance crews were mobilized some 541 times per day (once every 2.7 minutes) and that some 442 people were transported by ambulance daily.
Figures show that approximately one in 13 citizens called an ambulance, and that approximately one in 17 citizens were actually transported by ambulance during the space of the year.

Section	2009(a)	2008(b)	(a-b)
Number of missions	197,366	193,368	3,998
Number of people transported	161,251	161,251	0

By Osaka Municipal Fire Department (O.M.F.D.)

Type of emergency

Section	2009(a)	2008(a)	(a-b)
Total	197,366	193,368	3,998
Sudden illness	131,441	127,800	3,641
General injury	28,913	28,212	701
Traffic accidents	16,949	17,455	-506
Inflicted injury	3,260	3,327	-67
Self-inflicted injury	2,901	2,610	291
Fire-related	1,320	1,272	48
Labor-related injury	1,145	1,228	-83
Sport-related	831	779	52
Flood-related	76	56	20
Natural disaster	7	2	5
Others	10,523	10,627	-104

By Osaka Municipal Fire Department (O.M.F.D.)

EMS System in Osaka –Medical Control

Task:

- On-line medical control (Suggestion of ALS)
- Off-line medical control

  Developing medical protocols

  Quality evaluation (Peer Review) of EMS provider's performance for all Cardiac arrest cases and severe trauma cases

  Quality evaluation of medical equipment (AED, ventilator, endotracheal tube….)

  Education of paramedic

  etc…

EMS Research

- The Utstein Osaka Project (1998-)

Ongoing large-scale population-based cohort study of individuals with out-of-hospital cardiac arrests (OHCA) in Osaka, Japan. (Cardiac Arrest 12,000/year)

Outcome-EMS Research

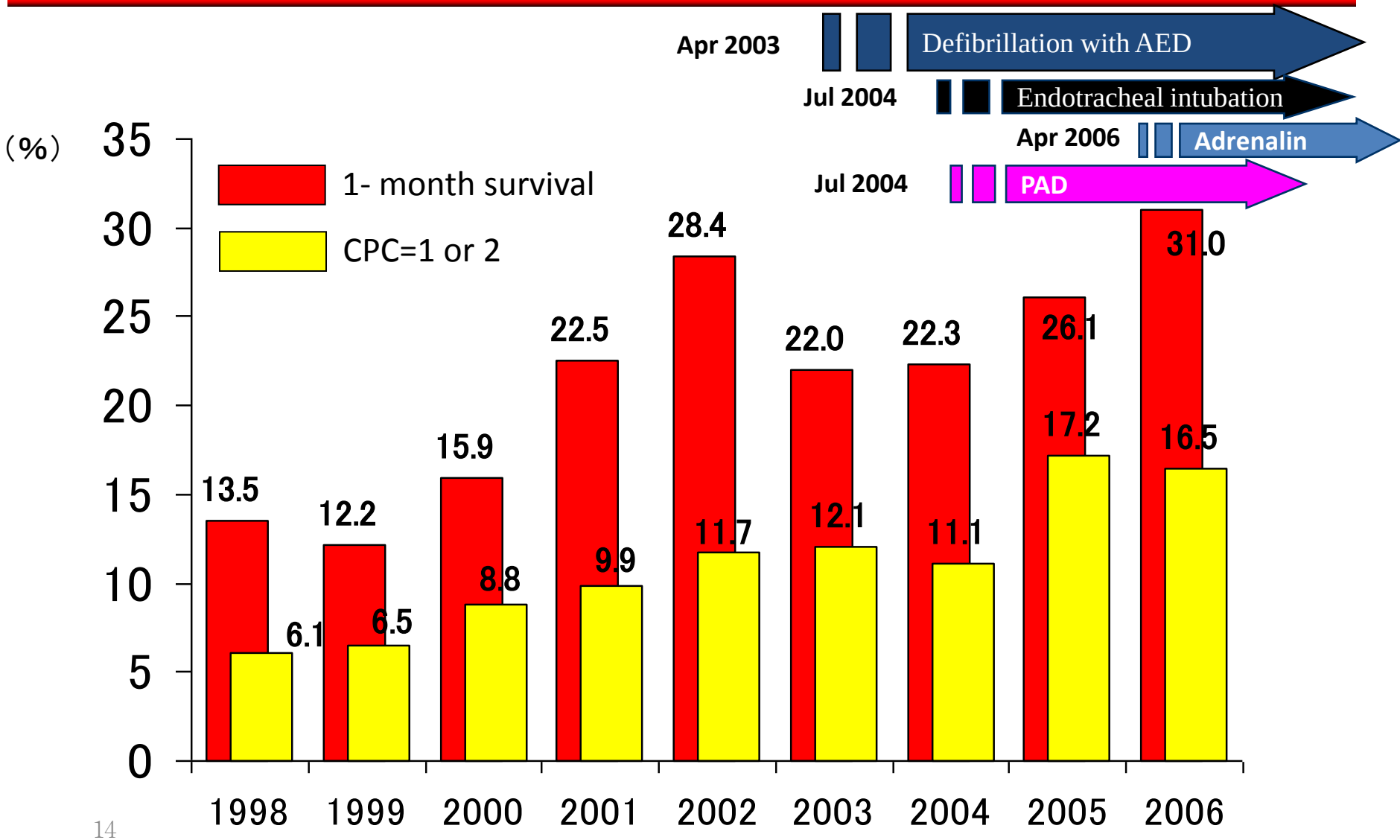
Table 2. Patient and EMS characteristics for witnessed cardiac arrests of presumed cardiac etiology according to time period.

	1998 (n=598)	1999 (n=964)	2000 (n=987)	2001 (n=1,035)	2002 (n=939)	2003 (n=1,003)	2004 (n=975)	2005 (n=1,083)	2006 (n=1,198)
Age, yr, mean (SD)	68.2 (16.0)	68.3 (15.4)	69.4 (15.7)	70.7 (14.8)	70.3 (14.5)	70.4 (15.5)	72.0 (14.8)	71.6 (15.2)	72.2 (14.5)
Male, No. (%)	387 (65.0)	607 (63.4)	624 (63.4)	669 (65.0)	580 (61.9)	634 (63.3)	589 (60.4)	685 (63.3)	771 (64.4)
VF, No. (%)	98 (16.4)	168 (17.4)	147 (15.1)	171 (16.8)	179 (19.3)	206 (20.7)	226 (23.3)	241 (22.3)	297 (24.8)
Bystander-initiated CPR, No. (%)									
Compression-only CPR	44 (7.4)	112 (11.7)	96 (9.8)	133 (13.0)	117 (12.6)	136 (13.6)	152 (15.8)	156 (14.4)	199 (16.6)
Conventional CPR	68 (11.4)	127 (13.2)	148 (15.1)	182 (17.7)	181 (19.5)	196 (19.7)	203 (21.1)	227 (21.0)	233 (19.4)
Resuscitation time course, min, median (IQR)									
Collapse to call	4 (2-11)	4 (1-11)	4 (1-10)	3 (1-6)	3 (1-5)	3 (1-5)	3 (1-5)	3 (1-6)	2 (1-5)
Collapse to first CPR	9 (5-13)	8 (3-12)	8 (4-12)	8 (3-11)	7 (3-11)	7 (2-11)	7 (2-11)	7 (3-11)	7 (3-11)
Collapse to first shock*	19 (13-22)	17 (13-20)	14 (11-18)	14 (11-18)	14 (11-18)	11 (8-15)	11 (8-14)	10 (7-12)	9 (7-12)
Collapse to intubation†	25 (20-33)	25 (20-32)	26 (20-33)	26 (20-33)	26 (20-31)	27 (22-33)	28 (22-33)	26 (20-33)	25 (19-32)

* Calculated for cases with VF as initial rhythm.

Iwami et al.Circulation.2009; 119:728-734.

Temporal trend in survival after witnessed VF cardiac arrest



The Utstein Osaka Project

Current Challenges

- Developing of the education and collaboration system for disaster medicine (2007~ Osaka prefectural government)
- Management of the Doctor helicopter
  (2008~ Osaka University hospital and Osaka prefectural government collaborated)
- The analysis of EMS provider's performance record for ten years except the CPA case
- Developing and disclosing of a clear EMS medical protocol to citizen.
- Developing of the clear patients transportation hospitals criteria

Current Challenges

G Model
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Clinical Paper

Impact of transport to critical care medical centers on outcomes after out-of-hospital cardiac arrest☆,☆☆

Kentaro Kajino[a,*], Taku Iwami[b], Mohamud Daya[c], Tatsuya Nishiuchi[d], Yasuyuki Hayashi[e], Tetsuhisa Kitamura[b], Taro Irisawa[f], Tomohiko Sakai[f], Yasuyuki Kuwagata[f], Atushi Hiraide[g], Masashi Kishi[a], Shigeru Yamayoshi[a]

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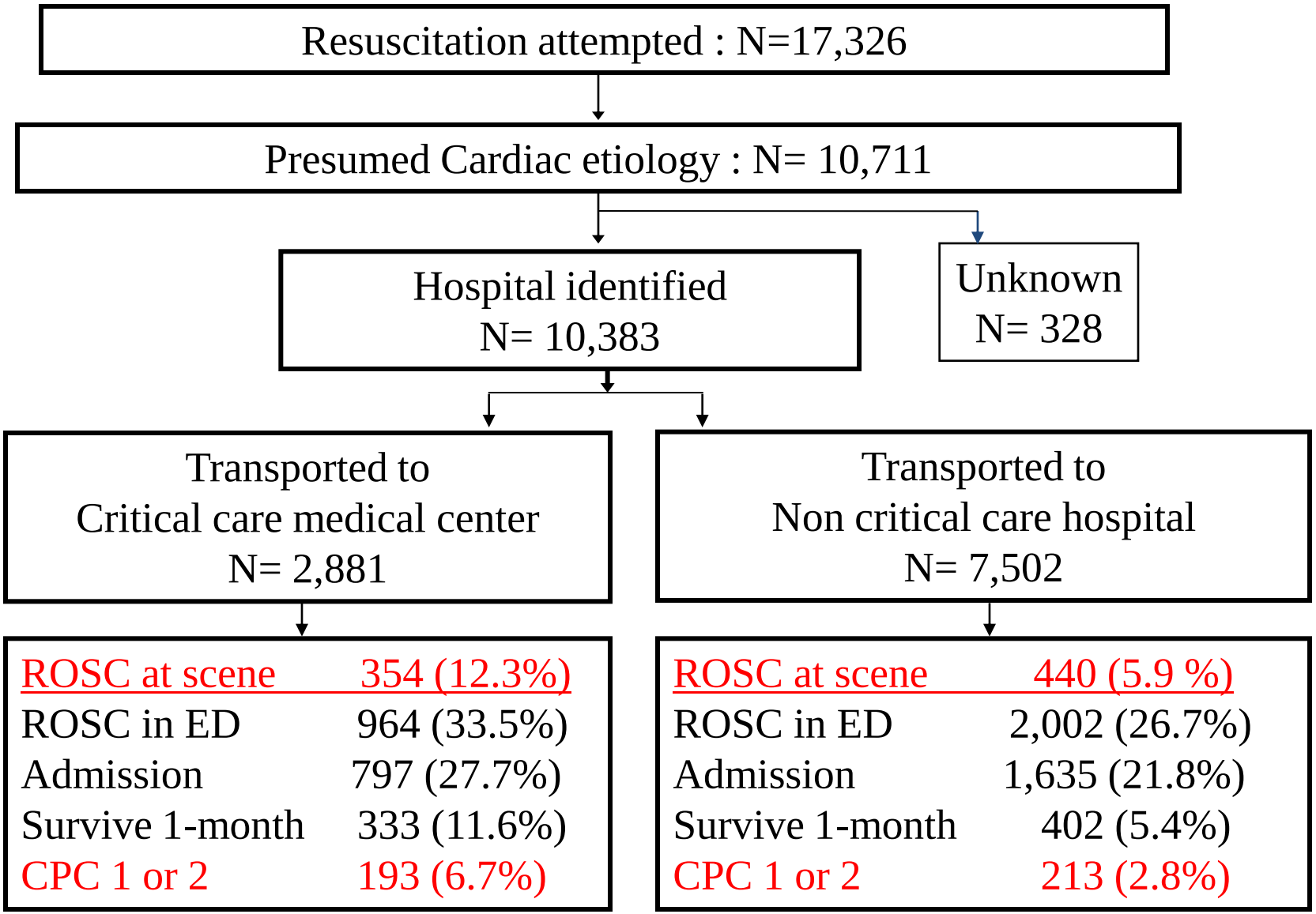
Impact of transport to critical care medical centers on outcomes after out-of-hospital cardiac arrest



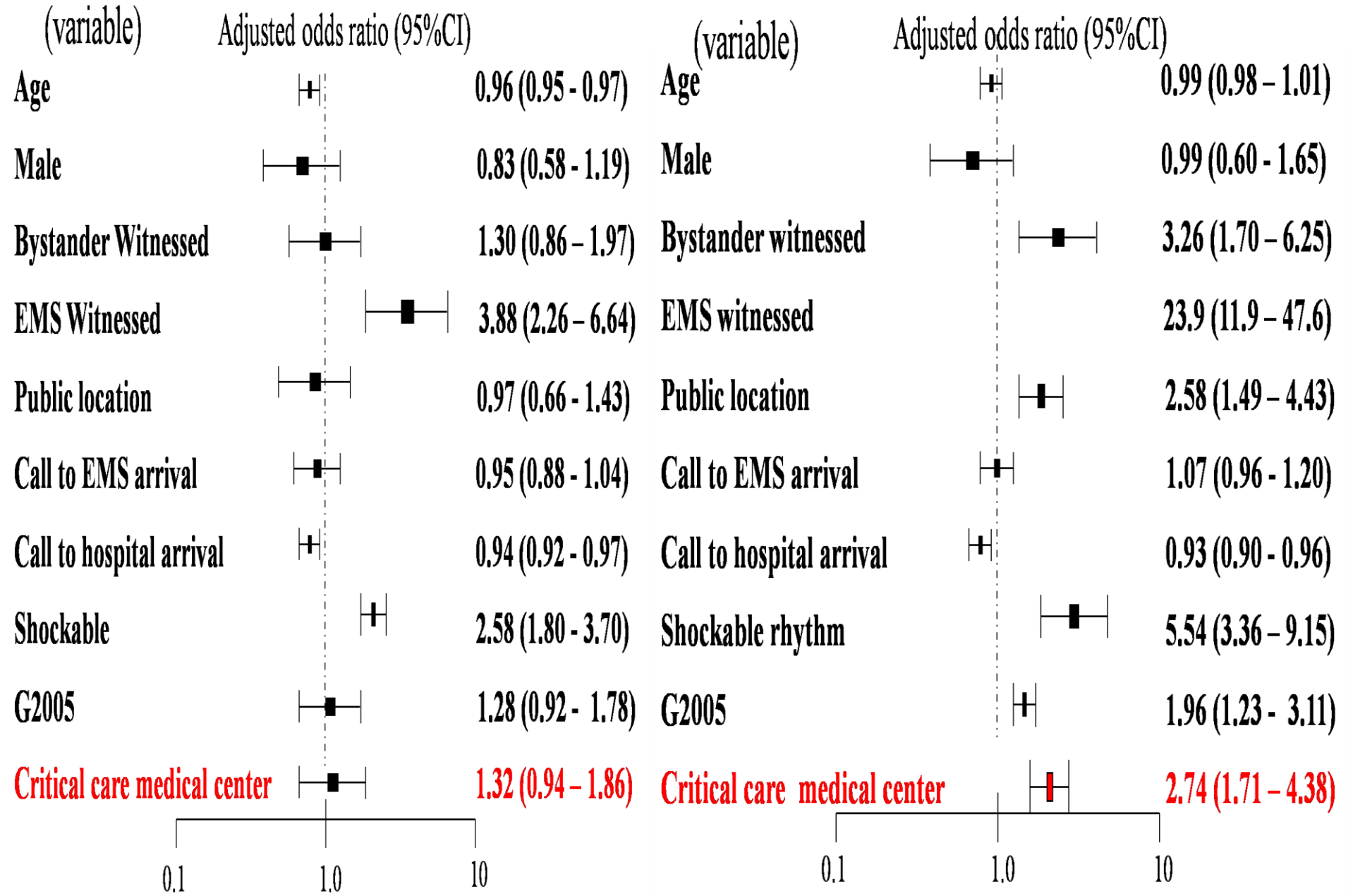
Kajino et.al, Resuscitation. 2010

Table 2: Patient main Outcomes according to ROSC status

	A) field ROSC			B) without field ROSC		
Number (%)	CCMC	NCCH		CCMC	NCCH	
	354	440	P value	2,527	7,062	P value
Hospital admission	301 (85.0)	384 (87.3)	0.361	496 (19.6)	1,251 (17.7)	0.032
	0.83 (0.55-1.24)	Reference		1.13 (1.01-1.27)	Reference	
1-month survival	203 (58.2)	245 (56.6)	0.656	130 (5.2)	157 (2.2)	＜0.001
	1.07 (0.80-1.42)	Reference		2.39 (1.89-3.03)	Reference	
Neurologically favorable outcome (CPC 1 or 2)	150 (43.0)	177 (40.9)	0.554	43 (1.7)	36 (0.5)	＜0.001
	1.09 (0.82-1.45)	Reference		**3.39 (2.17-5.29)**	**Reference**	

A:Field ROSC cases

B:Without field ROSC cases



Summary

Outcomes of patients with OHCA with field ROSC were similar regardless of transport destination in Osaka, Japan.

For patients without field ROSC, in-hospital resuscitation and post-resuscitation care in the CCMC were an independent predictor of outcome from OHCA

Conclusion

- Medical Control Committee and 'The Utstein Osaka project' have evaluated the activity of the EMS providers for the individual and all cardiac arrest case and assured the quality of emergency services.

- It is necessary to cooperate with emergency physician , Paramedic and administration for improving Prehospital care.

- We should continue developing patient centered Emergency Medical service.