Epidemiology of OHCA in Korea

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KRCPR
(Prospective, Multi-center, Hospital-based Registry)

• 23 hospital
n = 1,132 (1 year, Oct 2004 - Sep 2005)

KRCPR (Korean Registry of Cardio Pulmonary Resuscitation)

Resuscitation Council, Korean Society of Emergency Medicine
905 cases were analyzed (167 trauma-related, 60 No CPR attempted)
- Age 56.8 ±19
- Cardiac 57.8% (VT/VF 19.2%)

Place: Home (57%), public place (24%), ambulance (6%)

Witnessed (94%) by
Family (59%), Bystander (23%), EMT (5%), First responder (3%)

Transferred to Hospital by
119 (87%), ambulance (5%), private car (5%), taxi (1.6%), police cab (0.3%)

(KJ Song, Personnel communication, presented at 2009 APCC)
Pre-hospital phase

• The Collapse to
  – 119 (EMS) *Call* 4.9 min
  – The Collapse to EMS arrival 13.3 min
  – The Collapse to ED(Hospital) 27.4 min

• Bystander CPR 5.8%

*(KJ Song, Personnel communication, presented at 2009 APCC)*
Clinical Outcome

• ROSC 44%
• Death after ROSC
  – Within 24 hours 20%
  – After 24 hours 9.4%
• Moribund discharge 4%
• Discharge alive 10.3%

• Cause of death after ROSC
  – AMI 27%, Shock 24%, CHF 4%, CVA 14%, ARF 4%

(KJ Song, Personnel communication, presented at 2009 APCC)
NEDIS-based CA Registry

(NEDIS: National Emergency Department Information system)

• Jan 2008~July 2009, from 29 hospitals
• 4,156 resuscitation-attempted OHCA

• 9.6% survived to discharge
• 1.9% discharged with good neurological outcomes

Cardiac Arrest Cohort

• Study was funded by KCDC
  – Nationwide, 119(EMS) Report Registry
  – Reviewed the referred hospital records in 92%.

• 39,833 cases of out-of-hospital Cardiac Arrest were reported during 2006-2007 (for 2 years)
  – The approximated incidence of out-of-hospital cardiac arrest in Korea is 41/100,000 person year.
  – Cardiac 65.3%

(2009, Chronic Disease Survey Team, KCDC: Korea Center for Disease Control and Prevention)
심정지 장소의 분포

위치

공공 영역  가정  야외  기타/미상

2006  2007

Witnessed  40.1%  (unknown 13.1%)
Bystander CPR  1.4%  (unknown 44.7%)
# Time to care

<table>
<thead>
<tr>
<th>Region</th>
<th>Call to EMS arrival (BLS 제공까지 시간)</th>
<th>Delivery to Hospital (ED) (ALS 제공까지 시간)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
</tr>
<tr>
<td>Total</td>
<td>39,723</td>
<td>7.8</td>
</tr>
<tr>
<td>Seoul</td>
<td>6,851</td>
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<td>Busan</td>
<td>2,596</td>
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<td>Daegu</td>
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<td>Incheon</td>
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<td>Gwangju</td>
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<td>Ulsan</td>
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<td>GyeongGi</td>
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<td>Gangwon</td>
<td>1,781</td>
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<td>Chungbuk</td>
<td>1,421</td>
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<td>1,911</td>
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<td>Jeonbuk</td>
<td>1,914</td>
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<td>Jeonnam</td>
<td>2,074</td>
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<tr>
<td>Gyeongbuk</td>
<td>3,141</td>
<td>9.2</td>
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<td>3,004</td>
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<tr>
<td>Jeju</td>
<td>997</td>
<td>6.3</td>
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## Clinical Outcome

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<tr>
<th></th>
<th>Total</th>
<th>CPR attempted</th>
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<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Case analyzed</td>
<td>34,408</td>
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<tr>
<td>death</td>
<td>32,287</td>
<td>93.84</td>
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<tr>
<td>Survival to hospital admission</td>
<td>3,998</td>
<td>11.62</td>
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<tr>
<td>Survival to hospital discharge</td>
<td>841</td>
<td>2.44</td>
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<td>Neurologically “Good”</td>
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<td></td>
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<tr>
<td>CPC1</td>
<td>150</td>
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<td>CPC2</td>
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<td>Neurologically “Bad”</td>
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<td>CPC3</td>
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<td>CPC4</td>
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<td>CPC5</td>
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<tr>
<td>unknown</td>
<td>82</td>
<td>0.24</td>
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(2000년 4월 18일)

(2010년 2월 7일)

(OHCA: Out-Of-Hospital Cardiac Arrest)
History Of KACPR (Korean Association of CPR)

- 2002. 11 – lunching the organization (9 key members *)
- 2004. 11 – approved by the Ministry of Health and Welfare
- 2004. 12 – International Training Organization with AHA
- 2005 - Resuscitation Council of ASIA, started the AHA BLS Course
- 2006 – launched the layperson CPR education course
  Nationwide education sites of CPR (BLS, ACLS, PALS)
- 2012~2016 – CPR standard education program (KCDC)
- 2013 – 10th Anniversary Symposium of KACPR
- 2014 – KACPR received the Recognition Award Gold of AHA

2nd CPR day at Seoul City Hall Square
22 Oct 2006

Seoul Marathon
5 Nov 2006
(2011May8)

50 days later

138 days later
Figure 1  National Implementation of Utstein Ten-step Implementation Strategy by study period. CPR, cardiopulmonary resuscitation; AED, automatic external defibrillation; KOHCAR, Korea out-of-hospital cardiac arrest registry; EMS, emergency medical services; T-CPR, telephone-assisted CPR; OA, quality assurance; OHCA, out-of-hospital cardiac arrest.

(Kim YT, Shin SD. BMJ Open 2017;7:e016925)
EMS

• Started Telephone(Dispatch)-CPR guide
  – In 2011, Seoul
  – In 2012 Nation-wide

• 119/EMS QA (Quality Assessment) index
T-CPR Program to Improve Outcome in OHCA

- Bystander CPR rate
- Prehospital ROSC rate
- Survival to discharge rate
- Good neurological outcome rate
Korean OHCA Registry

EMS/119 report

KCDC

국가 심장정지 조사·감시 자문위원회

서방청

주요지표 결과 환류

구급활동일지 제공

질병관리본부 만성질환관리과

사업계획 수립
조사 수행 및 자료 등록
자료 질 관리
조사문항 및 지침 표준화
분석 및 통계집 발간

의무기록 조사

의무기록 조사 협조

의료기관

Hospital Medical Record

National CA Surveillance Consulting Committee
Some change in outcomes

- Prehospital ROSC: <.001
- Survival to discharge: <.001
- Good CPC: <.001
<table>
<thead>
<tr>
<th>Year</th>
<th>Incidence <em>(Standardized)</em></th>
<th>Bystander CPR <em>(raw)</em></th>
<th>Discharge-alive <em>(standardized)</em></th>
<th>Alive with <em>intact brain</em> <em>(standardized)</em></th>
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<td>2006</td>
<td>39.3</td>
<td></td>
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<td>2007</td>
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<td>5</td>
<td>4.3</td>
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<td>2017</td>
<td>39.4</td>
<td>21</td>
<td>10</td>
<td>6.1</td>
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MEASURE

IMPROVE

Slide courtesy Tom Rea, MD, Seattle
In 2015, 4 years later from collapse, Mr. Shin did the First Ball event at the Football stadium in audience of his previous colleague.
Still long way to go.....

• We have room to improve further.

• “Whole society, whole government” organization is required.

• Regional variation could be improved by Regionalized approach.

• We should build-up Preventive strategies in population
  – Need to define risk factors in population