

AHA2010 蘇生科学への貢献



2010AHA international award



日本の蘇生科学チーム



AHA2011 Orlando

Award in AHA2010



AHA2011 班研究発表者



アリゾナ大学、アリゾナ州



循環器内科Ewy教授

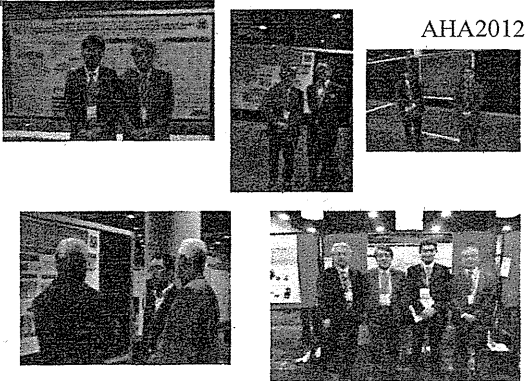
循環器医局会(ランチョン)で意見交換

レジデント3ヶ月留学、蘇生科学の実験で論文完成

Berg教授、小児集中・救急、ペンシルバニア大学へ移動

循環器Kern教授

AHA2012



AHA2012での国際交流促進



AHA-ECC

3月来日予定のBobrow, Koster先生

The Giants!

The Young Generation

Asian Night 2012

Becker先生、Danaさんのポスト

日本の蘇生科学チーム



AHA2012 LA 蘇生科学を語る夕べ

2010AHA international award to J-PULSE-

FAHA in AHA2012



救急蘇生に関するAHAとの連携 2012

For Resuscitation Science field in 2012 ReSS and AHA,

52 presentations from Japan (12%, 44/360抄録ReSS全体)
 (日本からAHA抄録857,42%採択率)
 JCS-RESS 19 (14 ReSS, 5 AHA)
 J-PULSE-Hypo 1(1 ReSS,)
 JRCPR 1(1 AHA), J-PULSE-III,1(ReSS1)
 SAVE-J 2(ReSS1, AHA1), others 28(27ReSS,1AHA)

日本冠疾患学会 Edelson先生
 日循2013 シンポジウム, JCS-RESS Bobrow先生
 第6回J-ReSS 2013 東京, 日本救急医学会A-ReSSとして開催

System of Care: Cardiac Arrest

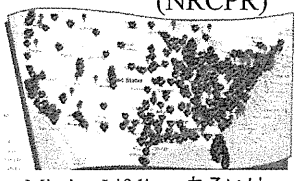
Minneapolis Heart Institute: Mooney先生、3月日循で来日



Lab Digest

1. Direct to earth lab
2. Equipment to earth lab
3. Pulse checks
4. Pulse applied
5. Group process
6. Log complications
7. Direct to Minneapolis, Minnesota
8. Mechanical ventilation

Post-cardiac-arrest care component added to Get With The Guidelines-Resuscitation program (NRCPR)



AHA2012LA

Mission Lifeline あるいは NRCPRで認証された病院

プログラム座長

Regional Systems of Care for Out-of-Hospital Cardiac Arrest & Policy Statement from the American Heart Association

Task Force convened to explore addition of Cardiac Resuscitation quality improvement efforts to current M.L. Program

Launch of STEM and Cardiac Resuscitation Systems of Care Mission-Lifeline program

STEMI & CARDIAC RESUSCITATION IDEAL SYSTEM

MISSION: LIFELINE

心停止の認識

- 心停止から6時間以内の低体温療法
- 早期のPCI
- 3日以内は脳機能判定を義務
- 遠くまで運ぶ必要あり

地域/市長

- 通報
- パンクオナー-CPR
- AED使用

救急隊

- 真の早いCPR
- 心停止後数分以内で心電図記録
- 鎮定プロトコール

救急トリアージ

緊急PCI対応施設


病院間連携

PCI非実施施設

- 心停止から6時間以内の低体温療法の開始
- 目標状態で血行動態が安定している非PCI施設への搬送を考慮

Lance Becker, MD

Center for Resuscitation Science
University of Pennsylvania



Cardiopulmonary Bypass

Mitochondrial Cocktail Hypothermia

Strategies to Limit reperfusion injury

The Future

www.ncvc.go.jp/topic... ↻

Google



国立循環器病研究センター
National Cerebral and Cardiovascular Center

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文字サイズ変更 (小) (中) (大)

[センターについて](#)

[教育・研修](#)

[研究推進・実績](#)

[イベント・ニュース](#)

[院員募集](#)

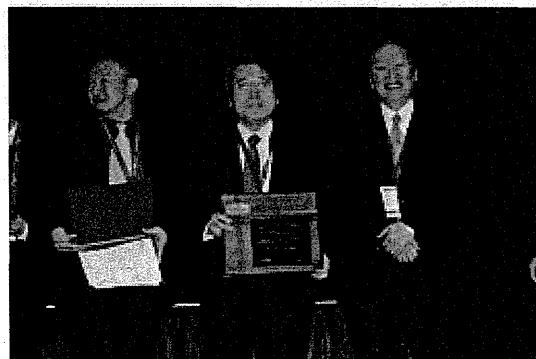
[関連情報](#)

現在の場所: [ホーム](#) → [トピックス](#) → 野々木 宏・心臓血管内科部門長が米国心臓協会年次集会で表彰されました。

野々木 宏・心臓血管内科部門長が米国心臓協会年次集会で表彰されました。

【表彰概要】

1st International Collaboration Award to Resuscitation Science (蘇生の科学における国際的貢献に対する表彰)
2010年11月13日米国心臓協会 (AHA) 学術集会蘇生科学シンポジウム (シカゴマコーミックプレイス)



【背景と意義】

病院外での突然死が数多く、その救命率は1割以下であり、その対策として、心肺蘇生法やAEDの普及により、徐々に救命例が増加しています。しかし、救命例の半数は脳機能の回復が十分ではなく、社会復帰できていませんでした (いわゆる植物状態)。

そのため、救命直後 (心拍が再開) に脳低体温療法で32°Cから34°Cの軽度低体温をすることで脳の機能回復が得られることがわかり、各国で実施されるようになりましたが、その適用例や適切な温度目標や実施期間、復温期間など不明なことが数多く、その決定が待たれていたところです。

我が国は、低体温療法や補助循環法など世界をリードできる環境にあり、厚生労働科学研究 (J-PULSE) では、その解明に多施設共同研究で世界で最大規模の症例数を収集し、2年間で19の演題を学術集会で報告し、蘇生の科学の推進に大きな貢献をしたことで今回の表彰にいたりました。初めて開設された賞であり、初受賞となったことは荣誉と考えられます。



American Heart Association
Resuscitation Science Symposium

Award for International Group Collaboration
to Advance Resuscitation Science

*Recognizing major contributions to fundamental or
clinical science related to cardiac arrest or traumatic injury*

J-PULSE Investigators



November 13, 2010

Chicago, Illinois

日本循環器学会

J-Hypo

抄録・スライド

Relationship between favorable neurological outcome and time interval from collapse to return of spontaneous circulation in patients treated with hypothermia: J-PULSE-Hypo

Taketomo Soga, Ken Nagao, Hiroyuki Yokoyama, Naohiro Yonemoto, Hiroshi Nonogi, J-PULSE-Hypo investigators

Background

The early defibrillation using automatic external defibrillation (AED) improved likelihood of survival for patients with out-of-hospital ventricular fibrillation (VF), but the neurological intact survival rate was about 15%. We investigated the relationship between neurological benefits and time interval from collapse to return of spontaneous circulation (ROSC) in patients treated with hypothermia.

Methods

We did a multicenter observational study of hypothermia for unconscious adult patients with ROSC after out-of-hospital cardiac arrest.

Results

Of the 452 unconscious adult patients treated with therapeutic hypothermia, 435 who were cooled to 32°C to 34°C were included; 341 were VF arrest (VF group) and 94 were non-VF arrest (non-VF group). The VF group had a higher frequency of favorable neurological outcome than the non-VF group (63.7% vs. 27.7%, $p < 0.0001$). The favorable neurological outcome of VF group decreased in stepwise fashion across the increasing quartiles of the collapse-to-ROSC interval. The collapse-to-ROSC interval cutoff value of 27.5 min had an accuracy of 72.2% for identification of a favorable neurological outcome. A frequency of favorable neurological outcome was 81.5% in patients who achieved ROSC within 27.5 minutes after VF cardiac arrest.

Conclusions

In patients undergoing mild hypothermia after ROSC, time interval from collapse to ROSC was an independent predictor for a favorable neurological outcome. Further research is needed in patients with prolonged CPR of 27.5 min or longer.

Early Induction of Hypothermia Using Intravenous Ice-cold Fluids Contributes Neurological Outcomes for patients with Out-of-hospital VF Cardiac Arrest: J-PLUSE-Hypo Registry

Background: Animal studies showed that the sooner cooling is initiated after return of spontaneous circulation (ROSC) from cardiac arrest, the better the outcome. In clinical cases, although intravenous ice-cold fluids cannot be used to reach a target core temperature of 34°C or less and to maintain hypothermia, it can be conducted rapidly, easily and inexpensively.

Methods: We conducted a multicenter observational study of therapeutic hypothermia for unconscious adult patients with return of spontaneous circulation after out-of-hospital cardiac arrest (J-PLUSE-Hypo Registry). The J-PLUSE-Hypo committee entrusted each hospital with the timing of cooling, cooling methods, target temperature, duration, and rewarming rate.

Results: Of the 452 patients treated with hypothermia after ROSC from out-of-hospital cardiac arrest, 300 who were cooled to 34°C after ROSC from out-of-hospital cardiac arrest due to ventricular fibrillation were included; 157 received intravenous infusion of ice-cold fluids as an induction of hypothermia (IV group). 143 received hypothermia without intravenous cold fluid (Non-IV group). The time interval from collapse to initiation of the cooling was shorter in the IV group than in the Non-IV group (a median: 53 minutes vs. 165 minutes, $p < 0.001$). The IV group had higher frequency of favorable neurological outcome than the Non-IV group (69% vs. 55%, $p = 0.011$).

Conclusions: Early induction of hypothermia using intravenous ice-cold fluids was associated with better neurological outcome.

Title: Efficacy of Therapeutic Hypothermia for Out-of-hospital Cardiac Arrest in Patients with Non-ventricular Fibrillation: J-PULSE-Hypo Registry

Authors: Yoshio Tahara, Kazuo Kimura, Naoto Morimura, Ken Nagao, Naohiro Yonemoto, Hiroyuki Yokoyama, Hiroshi Nonogi

Abstract:

Background: Therapeutic hypothermia (TH) is effective for patients who remained comatose after resuscitation from out-of-hospital cardiac arrest (OHCA) due to ventricular fibrillation (VF). However, whether TH is effective for OHCA without VF remains unclear.

Methods: We conducted a multicenter retrospective study at 14 institutions to evaluate the effect of TH on OHCA from 2005 to 2009. Enrolled patients were divided into the VF group, pulseless electrical activity (PEA) group, and asystole group according to the initial rhythm, and neurologic outcomes at discharge from the hospital were compared. A favorable outcome was defined as a Cerebral Performance Category (CPC) of 1-2.

Results: A total of 452 patients were enrolled. The mean age was 59±13 years. Men accounted for 83% of all patients. As compared with the asystole group (N=36), the PEA group (N=63) and the VF group (N=353) had higher rates of favorable outcomes (VF 63%; PEA 32%; asystole 19%, $p<0.01$). In non-VF group, the interval from collapse to return of spontaneous circulation (22±13 vs. 44±23 min, $p<0.01$) and the rate of return of spontaneous circulation before arrival at the hospital (74% vs. 26%, $p<0.01$) differed significantly between patients who had favorable outcome (N=27) and those who did not (N=72).

Conclusions: Our results suggested that TH was effective not only for OHCA due to VF, but also for OHCA due to causes other VF, particularly short interval from collapse to return of spontaneous circulation.

Title: Efficacy of Therapeutic Hypothermia for Out-of-hospital Cardiac Arrest in Patients with Non-ventricular Fibrillation: J-PULSE-Hypo Registry vs. SOS-KANTO study

Authors: Yoshio Tahara, Kazuo Kimura, Naoto Morimura, Ken Nagao, Naohiro Yonemoto, Hiroyuki Yokoyama, Hiroshi Nonogi

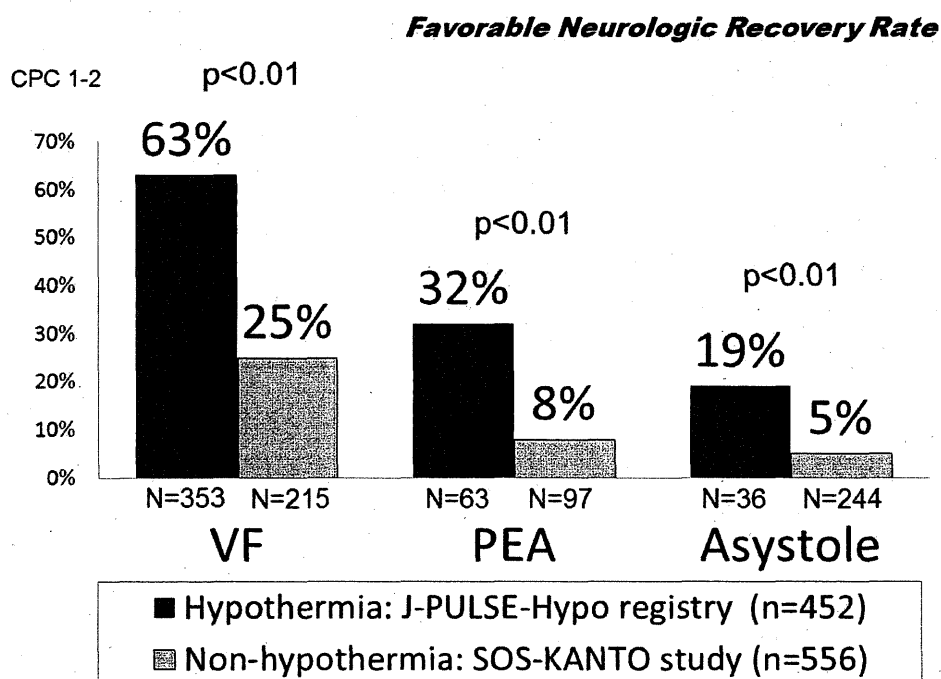
Abstract:

Background: It is unclear that therapeutic hypothermia (TH) is effective for patients who remained comatose after resuscitation from out-of-hospital cardiac arrest (OHCA) without ventricular fibrillation (VF).

Methods: We compared favorable outcomes (CPC 1-2) at discharge from the hospital according to the initial rhythm between the patients who received TH in the J-PULSE-Hypo registry (N=452, 14 institutions, from 2005 to 2009) and the patients who received standard advanced life support without TH in the SOS-KANTO study (N=556, 58 institutions, from 2002 to 2003).

Results: The rate of favorable outcomes according to the initial rhythm (VF, PEA, Asystole) differed significantly between the two studies.

Conclusions: Although the times and background characteristics of the studies differed, our results suggested that TH was effective not only for OHCA with VF, but also for OHCA without VF.



J-RCPR

抄録・スライド

The Impact of Individual Cardiovascular Disease on In-Hospital Cardiopulmonary Arrest (J-RCPR)

Author Block Taro Sasaoka, Natl Cerebral and Cardiovascular Ctr, Osaka, Japan; Naohiro Yonemoto, Natl Ctr of Neurology and Psychiatry, Tokyo, Japan; Hiroyuki Yokoyama, Hiroshi Nonogi, Natl Cerebral and Cardiovascular Ctr, Osaka, Japan; J-RCPR Investigators

Abstract:

Background: Some studies have shown almost one half of in-hospital cardiopulmonary arrest (IHCPA) patients are based on cardiovascular diseases. However, the detail of individual cardiovascular disease remains unknown. **Method:** A consecutive series of 491 adults with IHCPA were registered in Japanese registry of CPR for in-hospital cardiac arrest (J-RCPR). Among them, 222 patients (45%) were hospitalized for cardiovascular diseases; acute coronary syndrome (ACS, Group A, n=78), heart failure (HF, Group B, n=56), and arrhythmia (Group C, n=77). **Result:** Baseline characteristics IHCPA did not show significant difference in each group. Compared with other groups, Group B showed lower rate of ECG monitoring (Group A: 90%, Group B: 70%, Group C: 95%, $p<0.001$). Patients in Group A showed greater rate of IHCPA within 2 days of hospitalization (61% vs. 39% vs. 43%, $p<0.05$). The prevalence of first documented rhythm of IHCPA was not different in each group; however, the rate of return of spontaneous circulation (ROSC) was significantly higher in Group C (67%, 55%, 92%, $p<0.001$) and survival rate after 30days of IHCPA was significantly lower in Group B (41%, 27%, 52%, $p<0.001$). **Conclusion:** ACS patients showed higher rate of IHCPA within 2days of hospitalization. Interestingly, patients with HF showed poorer prognosis even though the prevalence of first documented rhythm was not different.

Cardiovascular and Non-cardiovascular Disease on the Prognosis of In-Hospital Cardiac Arrest (J-RCPR)

Author Block Taro Sasaoka, Natl Cerebral and Cardiovascular Ctr, Osaka, Japan; Naohiro Yonemoto, Natl Ctr of Neurology and Psychiatry, Tokyo, Japan; Hiroyuki Yokoyama, Hiroshi Nonogi, Natl Cerebral and Cardiovascular Ctr, Osaka, Japan; The Japanese Registry of CardioPulmonary Resuscitation (J-RCPR) Investigators

Abstract:

Background: In-hospital cardiopulmonary arrest (IHCPA) is an important factor of death; however, the detail of underlying disease remains unknown.

Method: 491 consecutive patients were registered in Japanese registry of CPR for in-hospital cardiac arrest (J-RCPR). They were divided into two groups; definitive cardiovascular disease (Group C, n=265), and non-cardiovascular disease (Group N, n=226).

Result: The prevalence of Vf/VT as first documented rhythm was 38.5% (16.4%, $p<0.0001$), asystole was 20.8% (39.8%, $p<0.0001$) in Group C (Group N). The survival rate was significantly higher in Group C, even though the rate of return of spontaneous circulation (ROSC) was not different. The rate of favorable neurological function was also higher in Group C (82.4% vs. 45.9%, $p<0.001$).

Conclusion: Patients with cardiovascular disease showed better outcome in IHCPA compared to patients with non-cardiovascular disease.

	Cardiovascular disease (Group C)	Non-Cardiovascular disease (Group N)	p-value
N	265	226	
Witness of IHCPA	85.7%	66.4%	<0.0001
First documented rhythm at IHCPA			
Vf or VT	38.5%	16.4%	<0.0001
Asystole	20.8%	39.8%	<0.0001
IHCPA within 2 days of hospitalization	46.0%	30.1%	<0.001
Place of IHCPA confirmed			
General Ward	41.1%	65.9%	<0.01
Intensive Care Unit	28.3%	18.1%	<0.0001
Outcome 30 days after IHCPA			
Death	63.4%	81.4%	<0.0001
Discharge	26.8%	18.1%	<0.0001
Favorable Neurological outcome (among pts survived at 30 days)	82.4%	45.9%	<0.001

Effect of CPR training on favorable neurologic outcome for in-hospital cardiac arrest from the Japanese Registry of CPR for In-hospital Cardiac Arrest (JRCPR)

Background:

Many training courses for CPR have been performed to medical personnel but few data have been reported those effect.

Method:

From 2008 to 2009, during 24 month, 491 patients were registered in the Japanese Registry of CPR for In-hospital Cardiac Arrest (JRCPR). In this study, 445 patients treated by the first responder received the CPR training (Group T n=357) and non-trained first responder (group n-T n=88) were analyzed.

We evaluated the ratio of return of spontaneous circulation (ROSC), 24 hours survival, survival discharge, good neurological function patients at discharge (CPC1 or 2 in Glasgow-Pittsburgh cerebral performance category) in each groups. We also analyzed each indexes initial rhythm VF/VT arrest (n=122) and PEA/Asystole (n=316).

Result:

The ratio of ROSC, 24hr survival, survival discharge and good neurological performance were 65.8%, 47.1%, 28.0%, 21.1% in group T, and 59.1%, 48.9%, 28.4%, 10.3% in group n-T (In good CPC $p < 0.05$). In VF/VT, the ratio were 80.2%, 70.3%, 50.5%, 45.5% in group T, and 74.2%, 64.5%, 35.5%, 15.4% in group n-T (In good CPC $p < 0.05$). In PEA/Asystole, the ratio were 60.8%, 38.5%, 19.6%, 12.6% in group T, 50.0%, 39.3%, 23.2%, 5.9% in group n-T.

Conclusion:

In-hospital cardiac arrest treated by the first responder with the CPR training is significantly associated with higher rate of favorable neurologic outcome, especially in VF/VT.

演題名 :

Clinical Outcome from In-Hospital Cardiac Arrest During Nights and Weekends: Japanese Registry of CPR for In-Hospital Cardiac Arrest(JRCPR)

抄録用図表の有無 : なし

抄録本文 :

Purpose: To examine whether outcomes after in-hospital cardiac arrest during nights and weekends differ from those during days and weekdays. Method: We examined survival from cardiac arrest in hourly time segments, defining day the time as from 8:00 to 15: 59, evening as from 16:00 to 23: 59, night as from 0:00 to 7:59, and weekends as Saturday and Sunday, in 488 adult, consecutive in-hospital cardiac arrest events in JRCPR obtained from 11 hospitals from January 1, 2008 though December 31, 2009. Results: 203 cases of in-hospital cardiac arrest occurred during day (106 on weekdays and 40 on weekends), 152 cases occurred during evening (106 on weekdays and 46 on weekends), 133 occurred during night (106 on weekdays and 27 on weekends). Rates of return of spontaneous circulation (ROS) during day were 79.1% on weekdays and 65.0% on weekends. Rates of ROS during evening were 64.2% and 58.7%, respectively. Rates of ROS during night were 53.8% and 37.0%, respectively. Survivals at 24 hours during day were 58.9% on weekdays and 50.0% on weekends. Survivals at 24 hours during evening were 47.2% and 47.8%, respectively. Survivals at 24 hours during night were 45.2% and 26.0%, respectively. Conclusion: Survival rates from in-hospital cardiac arrest are lower during nights and weekends.

演題名 :

Factors Related to Clinical Outcome in Patients with Ventricular tachycardia and fibrillation as Initial Arrest Rhythm in In-hospital Cardiopulmonary Arrest

抄録用図表の有無 : なし

抄録本文 :

(Background) Better survival rate had been reported in case of ventricular tachycardia (VT) and ventricular fibrillation (VF) as initial arrest rhythm compared with other rhythms (PEA or Asystole) in in-hospital cardiopulmonary arrest. It is still unknown about predictive factors related to clinical mortality in patients with VT and VF as initial arrest rhythm.

(Methods) In a prospective observational study from multicenter registry (JRCPR) from 2008 to 2009, 24 month, total of 137 adults (≥ 20 years, age: 66 ± 15) with VT and VF were assessed. Survival data (ratio of Return of Spontaneous Circulation (ROSC), 24-hour survival, survival to hospital discharge) and arrest variables were collected, including preexisting conditions and therapeutic interventions. To detect predictive factors related to

mortality, multivariate logistic regression analysis were performed. (Result) Of 137 patients, ratio of ROSC, 24-hour survival and survival to hospital discharge were 78.8%, 72.3% and 47.4%. After multivariate logistic regression analysis, advancing age, events during night and epinephrine use were significantly associated with poor outcome of both ROSC and survival to hospital discharge.

(Conclusion) For cardiac arrest with VT and VF as initial rhythm, high age, night event and epinephrine use appear to relate to poor outcome in in-hospital cardiopulmonary arrest. Further studies are needed to clarify the factors determining the prognosis of VT and VF in in-hospital cardiopulmonary arrest.

演題名：

The Impact of Therapeutic Hypothermia in the Treatment with Patients with out-of-Hospital Cardiacpulmonary arrest from J-Pulse-Hypo registry

抄録本文：

[Background] Mild hypothermia is an effective therapy for patients with return of spontaneous circulation after out-of-hospital cardiac arrest. However, the evidence of the efficacy of therapeutic hypothermia remains unclear. The purpose is to resolve clinical questions concerning therapeutic hypothermia by using multicenter registry database.

[Methods] We conducted a multicenter retrospective registry in Japan (J-Pulse-Hypo) from 14 institutions, to evaluate the effect of therapeutic hypothermia on out-of-hospital cardiac arrest, between January 2005 and December 2009. The committee entrusted each hospital with the timing of cooling, cooling methods, target temperature, duration, rewarming rate. Selection of cooling procedure was left to each institution.

[Results] In this study period, 452 patients (375 men) were enrolled into the registry. The age was 59 ± 13 years. Initial ECG are VF/VT 78%, PEA 14%, asystole 8%. The median interval from collapse to return of spontaneous circulation was 25 (17-40) minutes. Mean temperature was 33.9 ± 0.4 degrees C and mean cooling time was 32 hours. 102 patients (22.6%) were treated with percutaneous cardiopulmonary assisted devices, used in case with hemodynamic compromised state. The rates of favorable outcomes, Cerebral Performance Category of 1-2, at 30 days after onset was 69%. The rates of favorable outcomes were 63% in VF group, 32% in PEA group and 19% in asystole group.

[Conclusions] We conducted a multicenter retrospective registry and showed clinical aspect of therapeutic hypothermia.

演題名：

The Report from The Japanese Registry of CPR for In-hospital Cardiac Arrest (J-RCPR)

抄録本文：

[Backgrounds] In-hospital cardiopulmonary arrest (CPA) is an important matter and National Registry of Cardiopulmonary Resuscitation (NRCPR) from the United States reported that the rate of survival of hospital discharge following CPA was 18%. However, limited data are available in-hospital CPA in Japan. [Methods] Major pre-#8722;cardiac arrest and event, therapeutic interventions and time intervals and the data about condition of patients finally confirmed alive before CPA were collected. The patients with in-hospital CPA were registered prospectively from 11 hospitals, during January 2008 to December 2009 in Japan. All patients, visitors, employees, and staff within the facility campus, who experience a cardiopulmonary resuscitation event defined as either a pulselessness or a pulse with inadequate perfusion requiring chest compressions and/or defibrillation of ventricular fibrillation or pulseless ventricular tachycardia were registered with J-RCPR. [Results] 490 adults (71.0±14.9, M/F 310/180) enrolled. The prevalence of VF/VT as first documented rhythm was 28.3%, asystole was 30.0% and PEA was 41.7%. ROSC (return of spontaneous contraction) was 64.7%, rates of survival on 24 hr after CPA was 50.2%, and rates of good neurological outcome at 30 days after CPA was 21.4%. These prognosis of in-hospital CPA were similar as the report from NRCPR. Immediate cause(s) of event were arrhythmia 31.0%, hypotension 15.9%, and acute respiratory insufficiency 26.3%. 67.1% of the patients were confirmed alive within 10 min before CPA, 53.9% of the patients were monitored and 78.0% of the patients were witnessed at CPA. [Conclusion] This is the first report of in-hospital CPA in Japan. These results were similar as the results reported from NRCPR in the United States.

疫学学会

全国の救急医療機関からの搬送時間と循環器死亡率の関連:地理的要因の検討

米本直裕(ヨネモトナオヒロ) 嘉田晃子(カダアキコ) 横山広行(ヨコヤマヒロユキ) 野々木宏(ノギヒロシ):厚生労働科学研究班 J-PULSE:3
(国立循環器病研究センター)

目的:急性心筋梗塞症や脳卒中発症時に高度医療を時間の遅延なく効果的に提供できる救急医療システム構築が必要である。そこで、全国の循環器疾患による死亡状況を把握し、救急医療機関からの距離・時間の情報をあわせて分析し、急性期医療システムのあり方を検討する。

方法:エコロジカル研究。市区町村別死因別死亡率は、厚生労働省人口動態死亡調査のデータを用いた。実際の救急搬送の距離と搬送時間を収集するのは困難であるため、全国の循環器救急二次施設を特定し、施設と市区町村役場との距離を地図上で計測する方法を用いた。性年齢調整死亡率(SMR)、搬送時間、および両者の関連について記述、市区町村別地図に示した。

結果:特定した循環器救急二次施設は、全国で1998施設であり、都市部に集中していた。搬送時間の分布は、中央値:13分、25%点:4分、75%点:32分であり、施設の分布と対応し、施設の少ない地域の時間が長かった。73%の市区町村が30分以内であった。心疾患(高血圧以外)のSMRと搬送時間の関係では、東北や北海道、中国、四国、和歌山などの山間部や半島の先端に、SMRが高く搬送時間が長い地域が認められた。また、脳血管障害のSMRと搬送時間の関係は心疾患と類似していた。

考察:心疾患と脳血管障害について、搬送時間とSMRの関係を全国レベルで評価した。その結果、SMRが高く搬送時間が長い地域が明らかになった。施設の分布が都市部に集中していることから、施設までのアクセスに大きな違いがあり、そのアクセスの不便さがSMRの違いにつながっている可能性が示唆された。ただし、本研究はエコロジカル研究のためバイアスの影響の可能性があり、個人レベルのデータでの評価が今後必要である。