

Comparison between Initial Blood Examination Data and Neurological Outcome in Out-of hospital Cardiac Arrest Patients Treated with Hypothermia Therapy, from Multicenter Hypothermia Registry in Japan: J-PULSE- Hypo registry.

Kazunori Kashiwase, Naohiro Yonemoto, Hiroyuki Yokoyama, Ken Nagao, Hiroshi Nonogi and J-PULSE-Hypo Investigators.

Background: Although mild hypothermia (MH) has neurological benefits for patients with return of spontaneous circulation (ROSC) after out-of-hospital ventricular fibrillation cardiac arrest, there are limited data about predictors of good neurological outcome in these patients.

Method: Four years (2005-2008) data were available for 281 patients treated with MH in the multicenter registry in Japan (J-Pulse-Hypo). We examined the relationship between initial blood examination data and neurological outcome. Primary end point of this study was favorable neurologic outcome (cerebral performance category (CPC) 1 and 2) rate at 30 days.

Result: According to neurologic outcome at 30 days, we divided all cases into two groups: the favorable outcome group (n=158 (CPC 1=143, CPC 2=15)) and the unfavorable outcome one (n=123 (CPC 3=29, CPC 4=36 CPC 5 or death=58)). Favorable outcome rate at 30 days was 56.2%. Among initial data of blood examinations, there were significant differences in hematocrit (HCT), potassium (K), lactate dehydrogenase (LDH), glucose (BS), pH, carbon dioxide (PaCO₂), and base excess between the favorable and unfavorable outcome groups. By the multiple logistic regression analysis, HCT, LDH, BS, and PaCO₂ were revealed as the independent predictors of 30 days favorable outcome in addition to age, witness of cardiac arrest, and ROSC before admission.

Conclusion: Anemia, high LDH, hyperglycemia, and hypercapnia on admission were significantly associated with poor neurological outcome even among patients treated with hypothermia therapy.

Efficacy of Early Induction of Hypothermia Using Intravenous Ice-cold Fluids (J-PLUSE-Hypo registry) and Its Optimal Monitoring Places of Core Temperature

Background Animal studies showed that very early induction of hypothermia was beneficial to neurological outcome. Intravenous ice-cold fluids alone cannot be used to maintain hypothermia, but this cooling method can be used to institute easily and inexpensively.

Methods The J-PLUSE-Hypo was conducted as a multi-center hypothermia study. We added a study of optimal monitoring places of core temperature during intravenous 2000mL of normal saline at 4°C using high-pressure infusion bags to the J-PLUSE-Hypo. In our additional study, esophagus, rectum and bladder temperature were monitored as core temperatures. The primary endpoint of the J-PLUSE-Hypo was a favorable neurological outcome in 30 days survival.

Results In the J-PULSE-Hypo, 165 patients with return of spontaneous circulation after out-of-hospital ventricular fibrillation cardiac arrest were treated with mild hypothermia (34°C for 1 to 3 days). Of those, 74 were treated with intravenous ice-cold fluids in combination with other cooling methods (IV group) and 91 induced hypothermia using external or extracorporeal cooling method (no-IV group). The two groups had similar cooling-to-34°C interval (median: 168 min vs. 195 min, $p=0.68$), but a significant difference was seen in a favorable neurological outcome between the two groups (72% vs. 52%, $p=0.009$). In those patients, a core temperature was monitored by bladder, rectum or pulmonary artery temperature during the maintenance of hypothermia.

In our additional study, a mean administrated interval of ice-cold fluids was 14 minutes. Significant differences were seen in the core temperatures before and after initiation of ice-cold fluids among the three monitoring places (before ice-cold fluids: $34.4\pm 2.3^{\circ}\text{C}$ in the esophagus vs. $37.0\pm 1.2^{\circ}\text{C}$ in the rectum vs. $36.5\pm 1.2^{\circ}\text{C}$ in the bladder, $p<0.001$; after 30 minutes of ice-cold fluids: $32.5\pm 2.5^{\circ}\text{C}$ in the esophagus vs. $34.8\pm 1.7^{\circ}\text{C}$ in the rectum and $35.0\pm 1.5^{\circ}\text{C}$ in the bladder, $p<0.001$).

Conclusions Early induction of hypothermia using intravenous ice-cold fluids was associated with better neurological outcomes. During ice-cold fluids, the esophagus temperature was not suitable as a core temperature monitoring and its temperature created an overestimation.

Title: Impact of Target Core Temperature on Neurological Outcome of Cardiac Arrest Patients Treated with Therapeutic Hypothermia

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Background: Therapeutic hypothermia improves neurological outcome in patients with out-of-hospital cardiac arrest. However, ideal target core temperature remains unclear. We investigated the effects of target core temperature on neurological outcome of cardiac arrest patients treated with therapeutic hypothermia.

Methods: We conducted a multi-center retrospective study at 12 institutions to evaluate the effect of therapeutic hypothermia on out-of-hospital cardiac arrest between January 2005 and December 2008. The study committee entrusted each hospital with the timing of cooling, cooling methods, target temperature, duration, and rewarming rate. Enrolled patients were divided into the L group (32-33°C) and the M group (34-35°C) according to target core temperature, and neurological outcome was compared at hospital discharge. A favorable outcome was defined as a Cerebral Performance Category (CPC) of 1-2.

Results: A total of 281 patients were enrolled. The median interval from collapse to return of spontaneous circulation was 18 (13-25) minutes. Between the L group (n=35) and the M group (n=246), the rates of survivors (74% vs. 79%) and favorable outcomes (51% vs. 57%) were not statistically different. As compared with the M group, the L group had significantly higher rates of inadequately controlled core temperature (60% vs. 35%, $p=0.005$), and side effects of hypothermia (50% vs. 26%, $p=0.0079$).

Conclusions: This study indicated that target core temperature did not affect neurological outcome of cardiac arrest patients. In addition, the lower target temperature might cause increase of side effects. To control core temperature adequately, further studies of cooling methods and management are needed.

Impact of Percutaneous Coronary Intervention and Mild Hypothermia therapy for Patients with out-of-hospital Cardiac Arrest of Acute Coronary Syndrome from Multicenter Hypothermia Registry in Japan.

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Naohiro Yonemoto, Hiroyuki Yokoyama, Hiroshi Nonogi, National Cardiovascular Center and J-PULSE-Hypo Investigators.

(Background)

Mild hypothermia (MH) had neurological benefits for patients with return of spontaneous circulation (ROSC) after ventricular fibrillation (Vf) cardiac arrest. In the majority of those patients, sudden arrest is caused by acute coronary syndrome (ACS). Percutaneous coronary intervention (PCI) was preferred treatment strategy for patients with ACS after ROSC. The purpose of this study was to evaluate favorable neurological outcomes (cerebral performance category [CPC] 1 and 2) at 30 days for unconscious patients with ROSC after out-of hospital cardiac arrest.

(Method)

Three years (2005-2007) data were available for the 281 patients treated with MH in the multicenter registry (12 institutions) of the J-PULSE-Hypo in Japan. Of those 122 were diagnosed as ACS by coronary angiography after ROSC (age 60+/-11, man 95% [N=116]) and were treated with MH and PCI. Intra-aortic balloon pumping (IABP) or Percutaneous cardiopulmonary assisted devices (PCPS) were used in shock state.

(Result)

Mean core temperature was 33.9 degrees C and mean cooling duration was 32 hours. Mean time interval from collapse to ROSC was 30min and IABP was used in 61.5% (N=75), and PCPS in 29.5% (N=36). Favorable outcome rate at 30 days was 52.3% (N=64, CPC 1=58), including 59.4% in Vf, 27.4% in Pulseless Electrical Activity and 10.0% in asystole. In multivariate analysis, age, diabetes, and time interval from collapse to ROSC were the independent predictors of 30-day favorable outcome

(Conclusion)

MH with PCI for patients with ROSC after out-of-hospital cardiac arrest of ACS was effective for improvement of 30 days neurologic outcome even in the case of hemodynamic unstable and in any rhythm.

Key Word

Hypothermia, Acute coronary Syndrome, Percutaneous coronary intervention, Sudden cardiac death

Relationship between favorable neurological outcomes and time interval from collapse to ROSC in patients treated with hypothermia: a multicenter observational study

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Background Clinical evidence strongly supported mild hypothermia as an effective therapy for patients with return of spontaneous circulation (ROSC) after out-of-hospital cardiac arrest, but the patients who may benefit from this treatment have not been fully elucidated. We investigated the relationship between neurological benefits and time interval from collapse to ROSC.

Methods We did a multicenter observational study of therapeutic hypothermia for unconscious adult patients with ROSC after out-of-hospital cardiac arrest. The committee entrusted each hospital with timing of cooling, cooling methods, target temperature, duration, and rewarming rate. The primary endpoint was a favorable neurological outcome at hospital discharge.

Results A total of 281 patients were enrolled in this study. Of those, a favorable neurological outcome was seen in 157(55.9%). A median (IQR) collapse-to-ROSC interval was 25 (17-40) min, and the collapse-to-ROSC interval of patients with favorable neurological outcome was shorter than that with unfavorable neurological outcome (median; 18 min vs. 34 min, $p<0.0001$). The collapse-to-ROSC interval cutoff value of 25.5 min had an accuracy of 76.0% for identification of a favorable neurological outcome. In addition, a

collapse-to-ROSC interval of 65.5 min had a negative predictive of 100% for a favorable neurological outcome. In the multiple logistic-regression analysis, a collapse-to-ROSC interval cutoff value of 25.5 min was an independent predictor of a favorable neurological outcome.

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 25 min or longer.

Impact of Duration of Cooling in Mild Therapeutic Hypothermia on Comatose Survivors of Out-of-Hospital Cardiac Arrest: J-PULSE-Hypo Registry

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Introduction: Mild therapeutic hypothermia (MTH) has neuroprotective effect and provides improved survival and neurological outcome on comatose survivors of out-of-hospital cardiac arrest. But it is still unclear the optimal duration of cooling in MTH.

Hypothesis: We assessed the hypothesis that longer duration of cooling provide better neurologic outcome on comatose survivors of cardiac arrest treated with MTH.

Methods: We conducted a multicenter retrospective study at 12 institutions to evaluate the efficacy of MTH on comatose survivors of out-of-hospital cardiac arrest treated with MTH between 2005 and 2008. Duration of cooling was recorded in 251 patients. Patients were divided into 2 groups according to duration of cooling of < 36 hours (Group-A, N=150) or \geq 36 hours (Group-B, N=101). We assessed 30-day survival, 30-day favorable neurological finding, and complications. A favorable neurological finding was defined as a cerebral Pittsburgh performance category of 1 or 2.

Results: Time interval from collapse to return of spontaneous circulation (ROSC) was significantly longer in Group-A than in Group-B (median 18 min vs 22 min, $P=0.04$). There were no significant difference in the rate of 30-day survival (83% vs 84%, $P=0.74$) and 30-day favorable neurological finding (60% vs 55%, $P=0.47$) between Group-A and Group-B. Complications occurred more frequently in Group-A than in Group-B (19% vs 41%, $P<0.01$). Because baseline severity of patients (time interval from collapse to ROSC) was different between 2 groups, we provide additional analysis in patients with prolonged resuscitation (time interval from collapse to ROSC \geq 30 min). In patients with prolonged resuscitation (Group-A, N=39; Group-B, N=29; time interval from collapse to ROSC median 51 min vs 47 min, $P=0.47$), similar findings in the rate of 30-day survival (58% vs 68%, $P=0.53$), 30-day favorable neurological finding (33% vs 28%, $P=0.61$), and complications (36% vs 56%, $P=0.11$) were observed in Group-A and Group-B.

Conclusions: Cooling duration of more than 36 hours may not provide better neurological outcome, but also increase complications in comatose survivors of out-of-hospital cardiac arrest treated with MTH.

Multivariate analysis of 30 days favorable neurologic outcome

Variables	Hazard Ratio	95% C.I	p value
Age	1.044	1.014-1.075	0.004
Witness of cardiac arrest	3.924	1.330-11.577	0.013
ROSC before admission	2.495	1.044-5.964	0.040
<i>VT/VF in initial rhythm</i>	<i>0.964</i>	<i>0.652-1.425</i>	<i>0.854</i>
Time interval from collapse to ROSC	1.026	1.000-1.053	0.051
<i>Pupillary diameter on admission</i>	<i>1.224</i>	<i>0.953-1.572</i>	<i>0.114</i>
HCT	0.931	0.874-0.992	0.027
<i>K</i>	<i>0.892</i>	<i>0.594-1.340</i>	<i>0.583</i>
<i>Blood urea nitrogen (BUN)</i>	<i>1.018</i>	<i>0.987-1.049</i>	<i>0.266</i>
BS	1.005	1.001-1.009	0.027
LDH	1.003	1.001-1.005	0.006
PaCO₂	1.018	1.001-1.035	0.039
BE	0.940	0.880-1.004	0.067

Impact of Percutaneous Coronary Intervention and Mild Hypothermia therapy for Patients with out-of-hospital Cardiac Arrest of Acute Coronary Syndrome from Multicenter Hypothermia Registry in Japan.

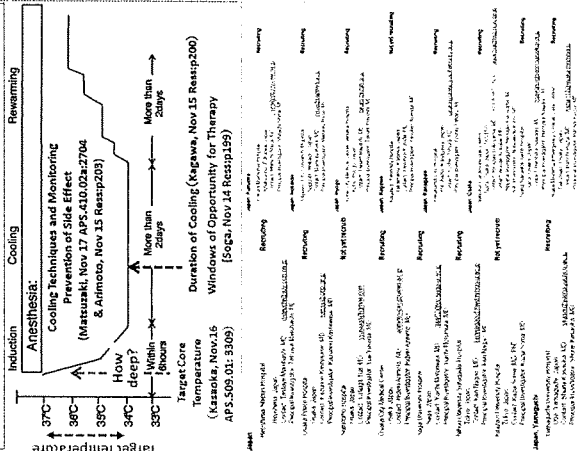
Shinichi Shirai¹, Tatsuki Doijiri¹, Kokura Memorial Hospital, Ken Nagao, Nihon University, Naohiro Yonemoto, Hiroyuki Yokoyama, Hiroshi Nonogi, National Cardiovascular Center and J-PULSE-Hypo Investigators.

BACKGROUND

Mild hypothermia (MH) had neurological benefits for patients with return of spontaneous circulation (ROSC) after ventricular fibrillation (VF) cardiac arrest. In the majority of those patients, sudden arrest is caused by acute coronary syndromes (ACS). Percutaneous coronary intervention (PCI) was preferred treatment strategy for patients with ACS after ROSC. And the success of revascularization was independent predictor of the survival. So far, evidence for the efficacy of combination therapy of mild hypothermia therapy with PCI was limited in the resuscitated patients with ST-elevation myocardial infarction (STEMI), however, it remains unknown of the efficacy of hypothermia therapy and PCI for the comatous survivors after cardiac arrest because of ACS. The purpose of this study was to evaluate the combination therapy of MH and PCI for the comatous survivors with established diagnosis of acute coronary syndrome by emergency coronary angiography performed immediately after ROSC for all of such patients with a aim.

8 Clinical Questions from J-PULSE-Hypo in 2009

Patients characteristics
Initial Patients Evolution (blood exam.) (Kashiwase, Nov 15 Resusp202)
Impact of AMI/ACS (Shirai, Nov 14 Resp p94)
PCPS with Hemodynamic Compromised State (Kokubu, Nov 14 Resusp95)



Method

The exclusion of this study was 1) less than 15years old, 2) pregnant woman, 3) aortic dissection with or without cardiac tamponade 4) cerebral hemorrhage or subarachnoid hemorrhage, 5) known terminal disease. Non-shockable rhythm such as asystole or pulseless electrical activity (PEA) and complicating cardiogenic shock were enrolled in this study. All of suspicious patients of acute coronary ischemic events or without clear etiology of arrest were transferred to catheter laboratory immediately after ROSC even without ST segment elevation in ECG and with compromised hemodynamic. If the thrombotic stenosis or occlusion was found in the culprit coronary artery, percutaneous coronary intervention was attempted, followed by stent implantation if needed.

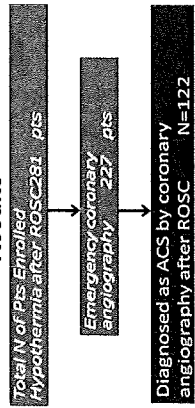
Intra-aortic balloon pumping (IABP) or percutaneous cardio-pulmonary support (PCPS) were used for the patients with compromised hemodynamic state at the discretion of the operator.

Cerebral performance category (CPC) with levels 1 (Normal mental performance), 2 (moderate disability), 3 (severe disability), 4 (vegetative state) was used at 30days. Favorable outcome was defined in CPC 1 or 2.

End-point of this study

Primary endpoint of this study was to evaluate favorable neurological outcomes (cerebral performance category [CPC] 1 and 2) at 30 days for unconscious patients with ROSC after out-of-hospital cardiac arrest. Secondary Endpoint of this study was to predict the 30 days neurologic outcomes.

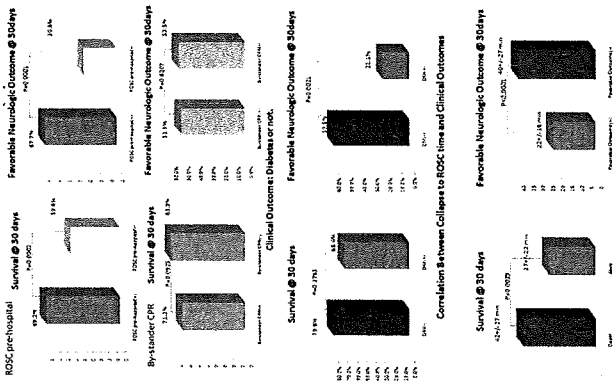
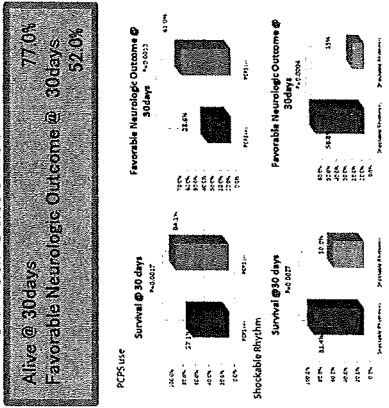
Results



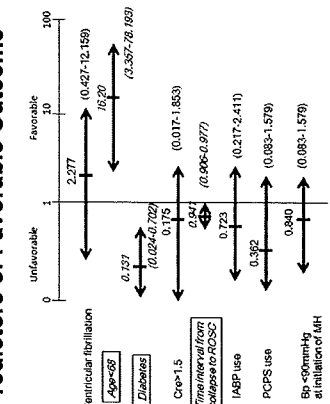
Baseline characteristics

Mean (X)	95.1
AGE	80.7±11
Bystander CPR (%)	54.1
Shockable Rhythm (%)	82.8
Mean no flow time (min)	3.0
OMI (%)	2.5
History of Heart Failure (%)	4.9
Stroke (%)	5.7
Hypertension (%)	35.0
Diabetes (%)	15.6
Mean GCS	3.8
ROSC before ER (%)	55.7
Hb (mean g/dl)	14.0±1.6
Serum K (mEq/l)	4.1±0.9
Cr_e (1.5 (X))	12.3
mean BE	-12.9
mean CA-ROSC	30.4±24
Cold saline use (%)	52.7
Surface cooling (%)	58.6
Over cooling during Tx (%)	26.0
cooling start to target temperature (min)	239.8±211.4
Mean cooling time (hrs)	35.6±14.0
Re-warming	
24 hours>= (%)	24.6
24-48 hours (%)	30.3
48-72 hours (%)	33.6
72 hours< (%)	9.0
Multivessel disease (%)	41.0
Anterior MI (%)	63.1
Left main culprit (%)	4.0
IABP use (%)	61.5
PCPS use (%)	29.5

Clinical Outcomes



Predictors of Favorable Outcome



Conclusion

MH with PCI for patients with ROSC after out-of-hospital cardiac arrest of ACS was effective for improvement of 30 days neurologic outcome even in the case of hemodynamic unstable and in any rhythm.

Comparison between Initial Blood Examination Data and Neurological Outcome in Out-of hospital Cardiac Arrest Patients Treated with Hypothermia Therapy, from Multicenter Hypothermia Registry in Japan: J-PULSE- Hypo registry.

Kazunori Kashiwase, Naohiro Yonemoto, Hiroyuki Yokoyama, Ken Nagao, Hiroshi Nonogi and J-PULSE-Hypo Investigators.

Abstract

Background: Although mild hypothermia (MH) has neurological benefits for patients with return of spontaneous circulation (ROSC) after out-of-hospital ventricular fibrillation cardiac arrest, there are limited data about predictors of good neurological outcome in these patients.

Method: Four years (2005-2008) data were available for 281 patients treated with MH in the multicenter registry in Japan (J-Pulse-Hypo). We examined the relationship between initial blood examination data and neurological outcome. Primary end point of this study was favorable neurologic outcome (cerebral performance category (CPC) 1 and 2) rate at 30 days.

Results: According to neurologic outcome at 30 days, we divided all cases into two groups: the favorable outcome group (n=158 (CPC 1=143, CPC 2=15)) and the unfavorable outcome one (n=123 (CPC 3=29, CPC 4=36 CPC 5 or death=58)). Favorable outcome rate at 30 days was 56.2%. Among initial data of blood examinations, there were significant differences in hematocrit (HCT), potassium (K), lactate dehydrogenase (LDH), glucose (BS), pH, carbon dioxide (PaCO₂), and base excess between the favorable and unfavorable outcome groups. By the multiple logistic regression analysis, HCT, LDH, BS, and PaCO₂ were revealed as the independent predictors of 30 days favorable outcome in addition to age, witness of cardiac arrest, and ROSC before admission.

Conclusion: Anemia, high LDH, hyperglycemia, and hypercapnia on admission were significantly associated with poor neurological outcome even among patients treated with hypothermia therapy.

Background

Although mild hypothermia (MH) has neurological benefits for patients with return of spontaneous circulation (ROSC) after out-of-hospital cardiac arrest, there are limited data about predictors of good neurological outcome in these patients.

Objective

To clarify the relationship between initial blood examination data and neurological outcome in patients with ROSC after out-of-hospital cardiac arrest treated with MH.

Methods: population

From 2005 to 2009, 281 patients treated with MH in the multicenter registry in Japan were analyzed retrospectively.

The exclusion criteria

- 1) less than 15 years old
- 2) pregnant woman
- 3) aortic dissection with or without cardiac tamponade
- 4) cerebral hemorrhage or subarachnoid hemorrhage
- 5) known terminal disease.

Primary end point

favorable neurologic outcome (cerebral performance category (CPC) 1 and 2) rate at 30 days.

Methods: mild hypothermia

After sedation with analgesia and in some cases, cold intra venous fluid (4 Celsius degree) was administered over 30-60 min to initiate hypothermia.

The methods of initiation or maintenance of hypothermia

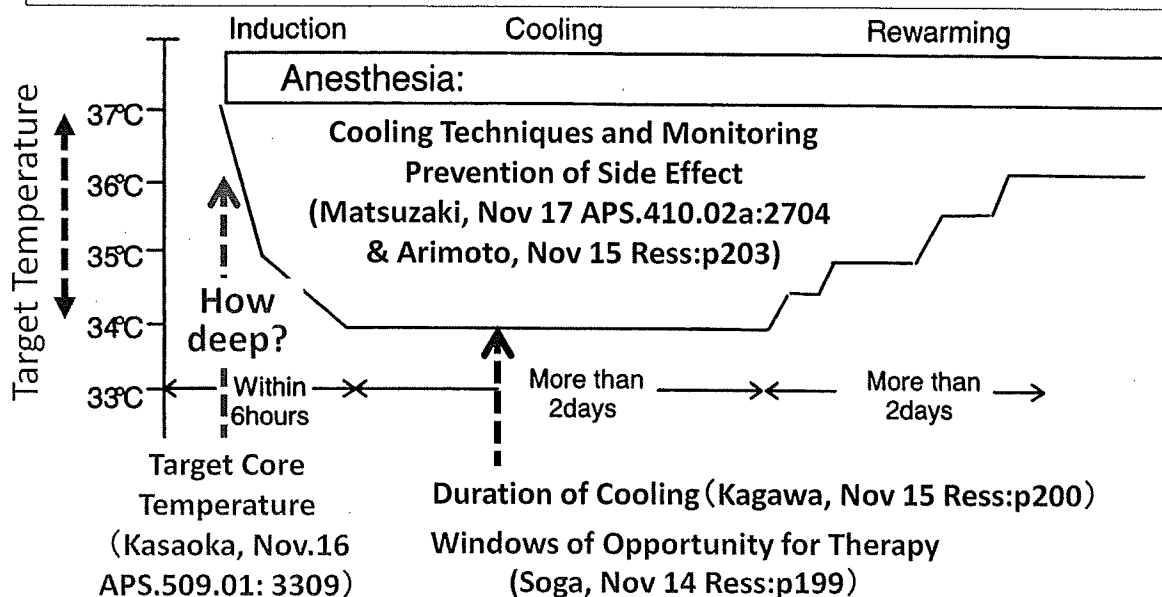
- 1) Surface cooling
 - a: Cooling Blanket (Blanketrol II)
 - b: Cooling device with self-adhesive, hydrogel-coated pads (Arctic Sun)
- 2) Blood cooling
 - c: Extracorporeal direct blood cooling (KTEK-II)
 - d: Endovascular cooling device (CoolGard 3000)

Mild hypothermia (32-34C) was maintained for 24-72 hours. Rewarming was conducted slowly and gradually and took at least 24-72 hours. Protocol of hypothermia was determined in each institutional state.

8 Clinical Questions from J-PULSE-Hypo in 2009

Patients characteristic

Initial Patients Evaluation (blood exam.) (Kashiwase, Nov 15 Res:p202)
Impact of AMI/ACS (Shirai, Nov 14 Res: p94)
PCPS with Hemodynamic Compromised State (Kokubu, Nov 14 Res:p95)



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Multicenter Registry Study With Therapeutic Hypothermia After Cardiac Arrest in Japan (J-PULSE-HYPO)

This study is currently recruiting participants.
Verified by National Cardiovascular Center, Japan, May 2009

Study Population

Patients with therapeutic hypothermia after cardiac arrest from 2005 to 2009 in each hospitals.

Criteria

Inclusion Criteria:

- Adult patients who remained unconscious after resuscitation from out-of-hospital or in-hospital cardiac arrest
- Presented the stable hemodynamics with drug treatments or mechanical supporting system including IABP or PCPS

Exclusion Criteria:

- Patients with:
 - pregnancy
 - acute aortic dissection
 - pulmonary thromboembolism
 - drug poisoning
 - poor daily activity

J-PULSE
hypothermia
registry

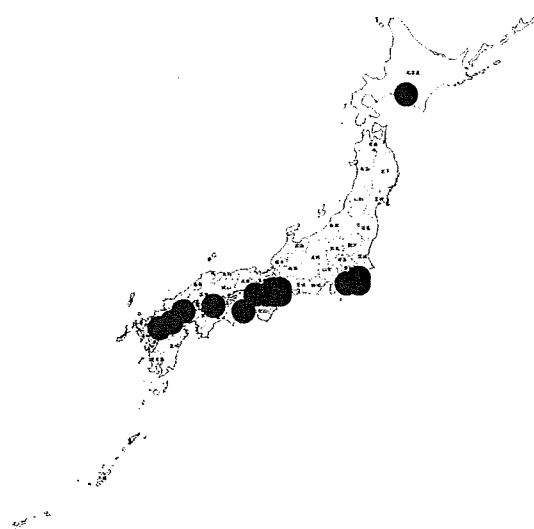
Multicenter Registry Study With Therapeutic Hypothermia After Cardiac Arrest in Japan (J-PULSE-HYPO)

ClinicalTrials.gov
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This study is currently recruiting participants.
Verified by National Cardiovascular Center, Japan, May 2009

First Received: May 12, 2009 No Changes Posted

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J-PULSE
hypothermia
registry

Results (1) Baseline Characteristics

	the favorable outcome group (n = 158)	the unfavorable outcome group (n = 123)	p value
Age (y)	55 ± 13	61 ± 12	< 0.01
Male (%)	****	****	****
Witness of cardiac arrest	****	****	****
ROSC before admission (%)	****	****	****
VT/VF in initial rhythm (%)	****	****	****
Time interval from collapse to ROSC (min)	22 ± 11	30 ± 15	< 0.01
Pupillary diameter on admission (mm)	3.6 ± 1.4	4.6 ± 1.8	< 0.01
Blood pressure at the initiation of MH (mmHg)	135 ± 34.8	118 ± 35.7	< 0.01
Heart rate at the initiation of MH (bpm)	100 ± 29	102 ± 28	0.427

Results (2) Initial blood examination

	the favorable outcome group (n = 158)	the unfavorable outcome group (n = 123)	p value
WBC ($10^3/\text{mm}^3$)	12.0 ± 4.88	12.6 ± 6.23	0.361
Hematocrit (Hct) (%)	42 ± 5.8	39 ± 7.1	0.01
potassium (K) (mEq/L)	3.9 ± 0.86	4.3 ± 1.2	0.410
BUN (mg/dL)	19 ± 13	22 ± 15	0.054
Creatinine (mg/dL)	1.4 ± 1.9	1.5 ± 1.5	0.553
Blood sugar (BS) (mg/dL)	246 ± 71.6	289 ± 114	< 0.01
lactate dehydrogenase (LDH) (mg/dL)	358 ± 153	433 ± 187	< 0.01
pH (blood gas)	7.22 ± 0.139	7.05 ± 0.196	< 0.01
PaO ²	278 ± 158	244 ± 177	0.111
PaCO ²	43 ± 17	58 ± 27	< 0.01
Base excess (BE)	-10 ± 5.9	-15 ± 6.2	< 0.01

Results (3) multiple logistic regression analysis

Variables	Hazard Ratio	95% C.I	p value
High age	1.044	1.014-1.075	0.004
Without witness of cardiac arrest	3.924	1.330-11.577	0.013
Without ROSC before admission	2.495	1.044-5.964	0.040
<i>VT/VF in initial rhythm</i>	0.964	0.652-1.425	0.854
Long time from collapse to ROSC	1.026	1.000-1.053	0.051
<i>Pupillary diameter on admission</i>	1.224	0.953-1.572	0.114
High HCT	0.931	0.874-0.992	0.027
<i>High K</i>	0.892	0.594-1.340	0.583
<i>High Blood urea nitrogen (BUN)</i>	1.018	0.987-1.049	0.266
High BS	1.005	1.001-1.009	0.027
High LDH	1.003	1.001-1.005	0.006
High PaCO ₂	1.018	1.001-1.035	0.039
High BE	0.940	0.880-1.004	0.067

Summary

There were significant differences in hematocrit (HCT), potassium (K), lactate dehydrogenase (LDH), glucose (BS), pH, carbon dioxide (PaCO₂), and base excess between the favorable and unfavorable outcome groups.

By the multiple logistic regression analysis, HCT, LDH, BS, and PaCO₂ were revealed as the independent predictors of 30 days favorable outcome in addition to age, witness of cardiac arrest, and ROSC before admission.

Conclusion

Anemia, high LDH, hyperglycemia, and hypercapnia on admission were significantly associated with poor neurological outcome even among patients treated with hypothermia therapy.

Presenter Disclosure Information

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Title: Comparison between Initial Blood Examination Data and Neurological Outcome in Out-of hospital Cardiac Arrest Patients Treated with Hypothermia Therapy, from Multicenter Hypothermia Registry in Japan: J-PULSE- Hypo registry.

DISCLOSURE INFORMATION:

There is no relationship related to this presentation.

Impact of Target Core Temperature on Neurological Outcome of Cardiac Arrest Patients Treated with Therapeutic Hypothermia

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Background

Therapeutic hypothermia improves neurological outcome in patients with out-of-hospital cardiac arrest. However, ideal target core temperature remains unclear.