

Poster Corner 1: Emergency and Neuro-Intensive Care

001 - FACTORS ASSOCIATED WITH SURVIVAL AFTER REARREST IN OHCA PATIENTS WITH FIELD ROSC: A PROSPECTIVE MULTIREGIONAL STUDY

J.H. Woo¹, J.S. Cho¹

¹Gachon University Gil Medical Center, Department of Emergency and Critical Care Medicine, Incheon, Korea, Republic of

INTRODUCTION. To our knowledge, there have been few studies of rearrest after field return of spontaneous circulation (ROSC) in out-of-hospital cardiac arrest (OHCA) patients. Most were retrospective studies that only used pre-hospital emergency medical service (EMS) records or electrocardiography records^{1,2}.

OBJECTIVES. Investigate factors associated with the occurrence of rearrest after field ROSC and examine factors associated with survival despite the occurrence of rearrest.

METHODS. We conducted a prospective multiregional study for OHCA patients between August 2015 and July 2016. Patients were treated with prehospital advanced cardiovascular life support (ACLS) by emergency medical technicians who were directly controlled by medical directors (physicians) via real-time smartphone video calls [smartphone-based ACLS (SALS)]. Data were collected from prospective databases including prehospital EMS records, medical directors' records, and hospital medical records. Study populations were categorized as "rearrest (+) group" and "rearrest (-) group" contingent upon the occurrence of rearrest after field ROSC. Study populations with rearrest were also categorized as survivors or non-survivors based on their survival upon hospital discharge.

RESULTS. During the study period, 1,711 OHCA patients received SALS. Field ROSC occurred in 345 patients (20.2%). In the rearrest (+) group [182 patients (52.8%)], initial shockable rhythm was less frequent [68 (37.3%) vs. 89 (54.6%), $p = 0.001$], the interval from collapse to first ROSC was longer [31 (24-38) vs. 23 (16-30) min, $p < 0.001$], and the systolic blood pressure was lower [90 (80-117.5) vs. 110 (90-140) mmHg, $p = 0.005$] than in the rearrest (-) group. In survivors after rearrest, an initial shockable rhythm was more frequent than in non-survivors [28 (77.8%) vs. 40 (27.4%), $p < 0.001$]. Using multivariate analysis, a longer interval from collapse to first ROSC [odds ratio (OR) 1.053; 95% confidence interval (CI) 1.015-1.093; $p = 0.006$] and lower systolic blood pressure [OR 0.987; 95% CI 0.976-0.998; $p = 0.02$] were independently related to the occurrence of rearrest and an initial shockable rhythm [OR 4.512; 95% CI 1.171-17.391; $p = 0.03$] was independently related to survival after rearrest.

CONCLUSIONS. A longer interval from collapse to first field ROSC was associated with the occurrence of rearrest and the initial shockable rhythm was associated with survival despite the occurrence of rearrest.

REFERENCES.

1. Bhardwaj A, Ikeda DJ, Grossestreuer AV, et al. Factors associated with re-arrest following initial resuscitation from cardiac arrest. *Resuscitation*. 2017 Feb;111:90-95.
 2. Salcido DD, Sundermann ML, Koller AC, Menegazzi JJ. Incidence and outcomes of rearrest following out-of-hospital cardiac arrest. *Resuscitation*. 2015 Jan;86:19-24.
- Grant Acknowledgement: This study was conducted with the support of the Ministry of Health and Welfare of the Republic of Korea.

002 - RESTARTING THERAPEUTIC ANTICOAGULATION IN PATIENTS WITH INTRACEREBRAL HAEMORRHAGE AND MECHANICAL HEART VALVES

J.B. Kuramatsu¹, J.A. Sembill¹, I. Retrace Investigators¹, S. Schwab¹, H.B. Huttner¹

¹University Hospital Erlangen, Neurology, Erlangen, Germany

AIMS. Evidence is lacking regarding acute anticoagulation management in patients after intracerebral haemorrhage(ICH) with implanted mechanical heart valves(MHV). Our objective was to investigate anticoagulation reversal and resumption strategies by evaluating incidences of haemorrhagic- and thromboembolic complications, thereby defining an optimal time-window when to restart therapeutic anticoagulation(TA) in patients with MHV and ICH.

METHODS AND RESULTS. We pooled individual patient-data($n=2504$) from a nationwide multicentre cohort-study (RETRACE, conducted at 22 German centres) and eventually identified MHV-patients patients ($n=137$) with anticoagulation-associated ICH for outcome analyses. The primary outcome

consisted of major haemorrhagic-complications analysed during hospital stay according to treatment exposure (restarted TA *versus* no-TA). Secondary outcomes comprised thromboembolic-complications, the composite outcome (haemorrhagic- and thromboembolic-complications), timing of TA, and mortality. Adjusted analyses involved propensity-score matching and multivariable cox-regressions to identify optimal timing of TA. In 66/137(48%) of patients TA was restarted, being associated with increased haemorrhagic-(TA=17/66(26%) *versus* no-TA=4/71(6%); $p < 0.01$) and a trend to decreased thromboembolic-complications (TA=1/66(2%) *versus* no-TA=7/71(10%); $p=0.06$). Controlling treatment crossovers provided an incidence rate-ratio(10.31,[95%CI:3.67-35.70]; $p < 0.01$) in disadvantage of TA for haemorrhagic-complications. Analyses of TA-timing displayed significant harm until day 13 after ICH (hazard-ratio: 7.06,[95%CI:2.33-21.37]; $p < 0.01$). The hazard for the composite - balancing both complications - was increased for restarted TA until day 6 (hazard-ratio: 2.51,[95%CI:1.10-5.70]; $p=0.03$).

CONCLUSION. Restarting TA within less than two weeks after ICH in patients with MHV was associated with increased haemorrhagic complications. Optimal weighing - between least risks for thromboembolic and haemorrhagic complications - provided an earliest starting point of TA at day 6, reserved only for patients at high thromboembolic risk.

003 - PEAK TROPONIN I LEVELS ARE ASSOCIATED WITH FUNCTIONAL OUTCOME IN INTRACEREBRAL HEMORRHAGE

S. Gerner¹, K. Auerbeck¹, M. Sprügel¹, J. Sembill¹, D. Madzar¹, P. Göllitz², P. Hoelter², J. Kuramatsu¹, H. Huttner¹

¹University Hospital Erlangen, Department of Neurology, Erlangen, Germany, ²University Hospital Erlangen, Department of Neuroradiology, Erlangen, Germany

INTRODUCTION. Troponin I is a widely used marker of myocardial damage and routinely measured in acute stroke care. Some reports suggested associations between troponin levels on admission with in-hospital mortality in patients with intracerebral hemorrhage (ICH). However, the impact of troponin elevations during hospital stay on functional outcome in these patients has not yet been established.

OBJECTIVES. To investigate the associations of troponin I levels during hospital stay with functional outcome in patients with atraumatic ICH.

METHODS. Observational single-center study including conservatively treated ICH patients over a 9-year period. Patients were categorized according to peak troponin I level during hospital stay (≤ 0.040 ng/ml; 0.041-0.500ng/ml; > 0.500 ng/ml) and compared regarding baseline and hematoma characteristics. Multivariable analyses were performed to investigate independent associations of troponin levels during hospital stay with functional outcome - assessed using the modified Rankin scale (favorable 0-3/unfavorable 4-6) - and mortality after 3 and 12 months. To account for possible confounding propensity-score (PS)-matching (1:1;caliper 0.1) was performed accounting for imbalances in baseline characteristics to investigate the impact of troponin I values on outcome.

RESULTS. Troponin elevations (> 0.040 ng/ml) during hospital stay were observed in 308/745 (41.3%) patients and associated with poorer status on admission (GCS/NIHSS) and more frequent intraventricular involvement (> 0.040 ng/ml: 204/308 (66.2%) *versus* ≤ 0.040 ng/ml: 182/437 (41.6%); $p < 0.001$). Multivariable analysis revealed troponin I levels during hospital stay to be independently associated with unfavorable outcome after 12 months (Risk-ratio (95%CI): 1.030 (1.009-1.051) per increment of 1.0ng/ml; $p=0.005$), but not with mortality. After PS-matching, patients with troponin I elevation (≥ 0.040 ng/ml) *versus* those without had a significant higher rate of unfavorable outcome after 12 months (mRS 4-6 at 12 months: ≥ 0.040 ng/ml: 179/266 (71.3%) *versus* < 0.040 ng/ml: 141/248 (56.9%); $p=0.001$).

CONCLUSIONS. Troponin I elevations during hospital stay occur frequently in ICH patients and are independently associated with functional outcome after 3 and 12 months, but not with mortality.

004 - DELAYED CEREBRAL ISCHAEMIA AFTER COILING VS. CLIPPING IN STABLE PATIENTS

T. Westerlund¹, P. Patel¹, S. Forrester¹, N. Keshwan¹, F.E. Martinez¹

¹John Hunter Hospital, Intensive Care Unit, New Lambton Heights, Australia

BACKGROUND. Delayed cerebral ischaemia (DCI) complicates aneurysmal subarachnoid

haemorrhage (aSAH) in approximately 30% of patients, with greatest risk 3-14 days after initial haemorrhage and would ideally require monitoring in a neurosurgical intensive care unit. [1] Since critical care is a finite resource in many parts of the world, some ICUs will discharge patients to a neurosurgical ward even before the risk period for DCI is over. [2] These patients are still at risk of DCI and finding ways to decrease this risk is important. [3]

OBJECTIVE. To determine whether early (within 72 hours) clipping or coiling of aSAH is associated with less risk of DCI in patients that are not requiring organ support and able to be discharged, or have been discharged, from ICU.

METHODS. Retrospective, single-centre, observational study.

RESULTS. All aSAH patients admitted to the ICU of a tertiary-referral, university-affiliated hospital, between June 2012 and June 2016 were screened. Patients still alive on aSAH day 7 post ictus, who had aneurysmal repair within 72 hours post ictus, and who were either discharged or not requiring ICU-specific interventions on day 7 were included. Ninety-seven patients were eligible for analysis. The overall rate of DCI was 29% (28/97). The rate of DCI for patients that underwent clipping was 43% (12/28) and for patients that underwent coiling was 57% (16/28) (Fisher's exact test $p= 1.0$).

Conclusions In aSAH patients that have undergone early securing of the aneurysm and who are not needing any ICU specific therapy at day 7 post ictus, there is no difference in rate of DCI between clipping versus coiling.



[DCI after clipping versus coiling in stable patients]

REFERENCES.

1. Rowland, M. J., Hadjipavlou, G., Kelly, M., Westbrook, J. & Pattinson, K. T. S. Delayed cerebral ischaemia after subarachnoid haemorrhage: looking beyond vasospasm. *Br. J. Anaesth.* 109: 315-329 (2012).
2. Spetzler, R.F. et al. The Barrow Ruptured Aneurysm Trial: 6 year results. *J Neurosurg.* 123: 609-617 (2015)
3. Dorhout Mees, S. M. et al. Occurrence and impact of delayed cerebral ischemia after coiling and after clipping in the International Subarachnoid Aneurysm Trial (ISAT). *J Neurosurg.* 259(4): 679-683 (2012)

005 - NONINVASIVE BRAIN TEMPERATURE MONITORING IN SWINE CARDIAC ARREST MODEL

G.J. Suh^{1,2}, K.S. Kim², W.Y. Kwon², Y.S. Jung², S.M. Shin², T. Kim², J.-I. Ko², K.S. Park³, D.S. Sung³
¹Seoul National University College of Medicine, Emergency Medicine, Seoul, Korea, Republic of,
²Seoul National University Hospital, Emergency Medicine, Seoul, Korea, Republic of, ³Seoul National University College of Medicine, Biomedical Engineering, Seoul, Korea, Republic of

INTRODUCTION. Therapeutic hypothermia (TH) after return of spontaneous circulation (ROSC) is the only way to reduce brain injury in post-cardiac arrest syndrome. During TH, esophageal, rectal or pulmonary artery temperature monitoring has been usually used as an alternative to reflect true brain temperature monitoring. However, temperature difference may occur depending on the measurement site. Moreover, injury to the brain results in thermopooling, which can cause greater temperature differences. However, direct brain temperature monitoring is too invasive to be applied clinically.

OBJECTIVES. Our aims were to compare invasive brain temperature with pulmonary artery, esophageal, rectal temperatures during TH in swine cardiac arrest or sham animals, and to develop a novel noninvasive brain temperature monitoring device to reflect true brain temperature.

METHODS. TH was provided to the swine CPR (post-ROSC) group or sham (no cardiac arrest) group. TH of 33°C ± 0.5°C was given for 8 hours and then slowly rewarmed over a 16 hours period. Invasive brain temperature using Hemadex system, pulmonary artery temperature, esophageal temperature and rectal temperatures were measured, respectively, and compared between the CPR and sham groups. Non-invasive brain temperature using double sensor device was also measured, Following K-value adjustment, validation study was done to compare invasive and noninvasive core brain temperature.

RESULTS. The difference between invasive brain temperature and rectal temperature was significant

in the CPR group compared to the sham group (0.21°C in CPR vs 0.07 sham, $p = 0.005$). However, the difference between invasive brain temperature and pulmonary artery or esophageal temperature showed no significance between the two groups. Noninvasive brain temperature monitoring were also well correlated with invasive brain temperature monitoring (correlation coefficient 0.9914).

CONCLUSIONS. We developed a novel noninvasive brain temperature monitoring device which can be used as an alternative for the invasive brain temperature monitoring. Temperature difference between invasive brain temperature and rectal was significantly different during the TH after ROSC.

REFERENCES.

Hypothermia after Cardiac Arrest Study Group. Mild therapeutic hypothermia to improve the neurologic outcome after cardiac arrest. *N Engl J Med* 2002;346:549-56. Lefrant JY, Muller L, de La Coussaye JE, et al. Temperature measurement in intensive care patients: comparison of urinary bladder, esophageal, rectal, axillary, and inguinal methods versus pulmonary artery core method. *Intensive Care Med* 2003;29:414-8.11.

Shin J, Kim J, Song K, et al. Core temperature measurement in therapeutic hypothermia according to different phases: comparison of bladder, rectal, and tympanic versus pulmonary artery methods. *Resuscitation* 2013;84:810-7.

GRANT ACKNOWLEDGMENT. This work was supported by a grant of the National Research Foundation of Korea (grant number: 10106259).

006 - PATIENTS WITH INTRACEREBRAL HEMORRHAGE AND NEED FOR RED BLOOD CELL TRANSFUSION MAY BENEFIT FROM A RESTRICTIVE TRANSFUSION PRACTICE

V.D. Beuscher¹, M.I. Sprügel¹, R. Zimmermann², S.T. Gerner¹, J.A. Sembill¹, H. Lücking³, A. Dörfler³, S. Schwab¹, H.B. Huttner¹, J.B. Kuramatsu¹

¹University Hospital Erlangen, Neurology, Erlangen, Germany, ²University Hospital Erlangen, Transfusion Medicine and Haemostaseology, Erlangen, Germany, ³University Hospital Erlangen, Neuroradiology, Erlangen, Germany

BACKGROUND. Data regarding influence of anemia and its treatment - using red blood cell transfusions (RBCT) - on functional outcome in intracerebral hemorrhage (ICH) do barely exist. Large randomized trials investigating RBCT excluded neuro-critical care patients, therefore evidence on transfusion thresholds remain highly debated. Aim of the present study was to delineate the impact of RBCT on functional outcome and identify an optimal transfusion threshold in ICH-patients.

METHODS. Prospective observational cohort study of ICH-patients admitted to Department of Neurology between 2006-2012, investigating as primary outcome the dichotomized functional status (modified Rankin-Scale(mRS)=0-3 versus 4-6) at 3 and 12 months according to treatment exposure (RBCT-versus-non-RBCT). Sub-analyses comprised patients who received RBCT to analyze transfusion thresholds. Confounding was addressed by propensity-score(ps)-matching (caliper 0.1) and adjusted regression analyses.

RESULTS. We identified 610 eligible ICH patients, of which 82(13.4%) received RBCT with a median of 2(2-4) units transfused at day 9(4-13) after admission. Confounders associated with RBCT consisted of younger age ($p < 0.01$), poorer neurological status (GCS;NIHSS; $p < 0.01$), larger ICH-volume ($p < 0.01$), and greater extent of intraventricular hemorrhage ($p < 0.01$). After balancing for confounding by ps-matching, patients that received RBCT showed a significantly decreased rate of favorable functional outcome at 3 (RBCT:6/80(7.5%)-versus-non-RBCT:39/144(27.1%); $p < 0.01$) and 12-months (RBCT:14/80(17.5%)-versus-non-RBCT:48/144(33.3%); $p = 0.01$). Sub-analyses showed that a restrictive transfusion regime (at hemoglobin levels < 4.97 mmol/l) was independently associated with favorable long-term functional outcome (risk-ratio:3.01(1.03-8.77); $p = 0.04$).

CONCLUSION. RBCT in ICH-patients was associated with poorer functional outcome even after rigorous correction for confounders. In transfused ICH-patients RBCT delivered at restrictive transfusion thresholds were independently associated with improved outcome at one year.

007 - NEUTROPHIL-TO-LYMPHOCYTE RATIO IS AN INDEPENDENT PREDICTOR FOR UNFAVORABLE FUNCTIONAL OUTCOME IN ANEURYSMAL SUBARACHNOID HEMORRHAGE

A. Giede-Jeppe¹, J. Reichl¹, H. Lücking², P. Hoelter², J.B. Kuramatsu¹, H.B. Huttner¹, S.T. Gerner¹, Huttner

¹University Hospital of Erlangen-Nuremberg, Department of Neurology, Erlangen, Germany,

²University of Erlangen-Nuremberg, Department of Neuroradiology, Erlangen, Germany

INTRODUCTION. Stroke-associated immunosuppression and inflammation are increasingly recognized as factors triggering infections and thus potentially influencing outcome after stroke. Several studies demonstrated that elevated neutrophil-to-lymphocyte ratio(NLR) is a significant predictor of adverse outcomes for patients with ischemic stroke or intracerebral hemorrhage. So far, in patients with subarachnoid hemorrhage the association between NLR and outcome remains unclear.

OBJECTIVES. To investigate the association between NLR on admission and functional outcome in aneurysmal subarachnoid hemorrhage (SAH) patients.

METHODS. This observational study included all consecutive aneurysmal SAH-patients admitted at a German tertiary center over a 5-year period (2008-2012). Patient demographics, clinical, laboratory and in-hospital measures as well as neuroradiological data were retrieved from institutional databases. Functional outcome at 3 months was assessed using the modified Rankin scale (mRS) and categorized into favorable (mRS 0-2) and unfavorable (mRS 3-6). Patients', radiological and laboratory characteristics were compared between SAH-patients with favorable and unfavorable outcome at 3 months. Further, multivariate analysis was conducted to investigate parameters independently associated with outcome and receiver operating characteristic (ROC-)curve analysis was undertaken to identify the best cut-off for NLR to discriminate between favorable and unfavorable outcome in these patients.

RESULTS. Overall, 322 patients with aneurysmal SAH were identified. Patients with unfavorable outcome were older, had worse clinical status on admission (Glasgow Coma Scale and Hunt&Hess grade), a greater amount of subarachnoidal and intraventricular hemorrhage (modified Fisher and Graeb score) and a higher rate of infectious complications (pneumonia and sepsis). A significantly higher NLR on admission was observed in patients with unfavorable outcome (median[IQR]: mRS=0-2: 5.82[3.01-10.04] vs. mRS=3-6: 8.25[4.53-12.61]; p=0.001). After adjusting for already established parameters associated with outcome, NLR on admission was a significant predictor for unfavorable outcome in SAH patients (Odds ratio[95%CI]:1.014[1.001-1.027];p=0.028). In ROC-analysis, a NLR of 7.05 was identified as best cut-off value to discriminate between favorable and unfavorable outcome at 3 months (area under the curve=0.614,p< 0.0001, Youden's index=0.211;mRS3-6:NLR_≥ 7.05 95/155(61.3%) vs. NLR< 7.05 67/167(40.1%);p< 0.001).

CONCLUSIONS. Among aneurysmal SAH patients NLR represents an independent parameter associated with unfavorable functional outcome. Whether the impact of NLR on functional outcome reflects a preexisting comorbidity or if there are independent effects in context of stroke-associated immunosuppression should be investigated in future studies.

GRANT ACKNOWLEDGMENT. None.

008 - ABDOMINAL TRAUMA: OCCURRENCE AND OUTCOME, AN EXPERIENCE FROM 500 PATIENTS

A.S. Alsheikhly¹

¹Hamad Medical Corporation, Doha, Qatar

Different forms of trauma have been a leading cause of death as seen in the Accident and Emergency specially in the age group of 1-50 years. Most of the usual causes outlined in the published literature include road traffic accidents, stab wounds, falls from height and gunshot wounds.

The abdomen is traumatized in about 10-15% of cases; this would be attributed to its large surface area compared with other parts of the body. This prospective study was carried out over a period of ten years starting January 2006 till end of December 2015, involving 500 cases with isolated abdominal injuries in some of the Gulf states and Iraq major hospitals. We highlight the incidence, gender distribution, available modalities of investigation and methods of improving management and prognosis of abdominal trauma in these variable hospitals. There were 500 purely abdominal trauma patients involved in the review over this ten-year period. Penetrating injuries were seen in 66 patients (13.2%) and nonpenetrating in 434 patients (86.8%). Gunshot injuries and fall from heights were (2.02%) and (3.05%) of the injuries respectively. The overall ratio of non-penetrating to penetrating injuries was approximately 6:1.

Wound sepsis was the most common complication of patients that underwent surgical exploration; mortality rate was (10%). The major cause of death was irreversible hypovolemic shock due to severe blood loss either prior to arrival in hospital or uncontrollable hemorrhage in the operating room and

extreme coagulopathy in the immediate post-operative period.

We advocate rapid transportation and prompt resuscitative measures, availability of modern technological investigations as well as surgical and intensive therapy skills in improving the outcome for victims of abdominal trauma regardless of the etiology. Spreading more awareness of the major factors in the causation of vehicular accidents and health education for drivers and road users, conspicuous display of speed limits as well as identification of the known accident black spots where road traffic accidents have historically been concentrated will be of significance in the prevention of future accidents and complications.

009 - LOW VERSUS STANDARD-BLOOD-FLOW REPERFUSION STRATEGY IN EXPERIMENTAL ISCHEMIC REFRACTORY CARDIAC ARREST TREATED WITH EXTRA CORPOREAL LIFE SUPPORT

L. yun¹

¹universite de lorraine, nancy, France

OBJECTIVE. This study was designed to assess the effect of two extracorporeal life support (ECLS) blood-flow strategy in an experimental model of E-CPR in the first six hours of resuscitation on macrocirculatory and microcirculatory parameters, lactate clearance and cytokine storm.

METHODS. Cardiac arrest was induced in 18 pigs by surgical ligation of the left descending coronary artery. ECLS was initiated after 40 minutes of cardiopulmonary resuscitation and the ECLS blood flow was set on 30-35 ml.kg⁻¹.min⁻¹ versus 65-70 ml.kg⁻¹.min⁻¹ according to the randomized group.

Continuous systemic blood pressure and carotid blood flow were continuously monitored. Blood gas analysis and lactate were measured at baseline H0, H3 and H6. Sublingual microcirculatory was assessed by sidestream dark field (SDF) technology and the following parameters were assessed: total and perfused vessels density (TVD, PVD), the proportion of perfused vessels (PPV) and microvascular flow index (MFI). Leg tissue oxygenation (StiO₂) was monitored by a Near-Infrared Spectrometer (NIRS) device. Cytokine inflammatory was measured by enzyme-linked immunosorbent assay (ELISA).

RESULTS. There was no differences between groups at baseline and at ECLS initiation (H0). Lactate and sublingual microvascular parameters were significantly impaired after the low-flow period. MAP target (65 mmHg) was reach in each randomized group. Total infused norepinephrine ((1422[908-2254] vs 710[63-1325] ug.kg⁻¹, $p=0.0623$) and total infused fluid (7600[4150, 19000] vs 9000[3100, 20750] ml, $p=0.9827$) were similar between the 2 groups. A significant difference was observed in the six hours evolution concerning carotid blood flow (low-blood-flow group vs standard-blood-flow group at H6: 19[5-34.45] vs 67.81[43.5-82] %, $p < 0.05$). Lactate clearance at H6 was inferior in the low-blood-flow group compared with the standard-blood-flow group (6.67[-10.46-18.78] vs 44.72[19.54-69.07] %, $p < 0.05$). Concerning the microvascular parameters, the low-blood-flow group had lower PVD (9.72[4.35-11.02] vs 12.05[10.94-14.51] mm.mm⁻², $p < 0.05$), PPV (70.55[36.07-78.92] vs 86.12[78.9-88.51] %, $p < 0.05$) and MFI (1.63[0.97, 2.35] vs 2.5[2.32, 2.69], $p < 0.05$) at H3 compared with the standard-blood-flow group but no significant difference observed at H6. TNF-a was lower (361[73-778] vs 1164[177-1848] ng.ml⁻¹, $p < 0.05$) in the low-blood-flow group at the end of the experiment.

CONCLUSION. In an experimental porcine model of refractory cardiac arrest treated by ECLS, a low-blood-flow strategy during the first six hours of resuscitation was associated with a decreased cerebral blood flow, lactate clearance and microcirculatory parameters despite a lower inflammatory response.

Key words: Extracorporeal life support; refractory cardiac arrest; ECLS blood flow; microcirculation; inflammatory response

010 - CLINICAL AND RADIOLOGICAL FINDINGS THAT PREDICT EARLY EVOLUTION TOWARD BRAIN DEATH

I. Astola¹, C. del Busto¹, L. Forcelledo¹, A. Meilan², B. Leoz Gordillo¹, S. Balboa¹, C. Díaz Gómez¹, R.M. Rodriguez García¹, L. Alvarez García¹, D. Escudero¹, Grupo de Investigación en Microbiología Traslacional del Instituto de Investigación Sanitaria del Principado de Asturias (ISPA).

OBJECTIVE. To identify clinical and radiological factors (CT scan) that can predict an early evolution toward brain death (BD) defined as the one that happens within the first 48h after admission.

METHOD. retrospective study in a third level hospital throughout 2015. Clinical and radiological variables of patients that evolved to BD were analysed by Student-Welch, Mann-Whitney and Chi-square tests. CT scans were interpreted by neuroradiologist.

RESULTS. 50 patients were assessed. Mean age 61,5 years-old [IC 0,95 (58-65)]. 52% male. Diagnosis at admission were 36% intracerebral haemorrhage, 24% subarachnoid haemorrhage, 16% brain trauma, 12% ictus and 12% post-anoxic encephalopathy. We found no statistical significance when comparing these variables with early BD.

Clinical history: 54% hypertension, 30% smoking, 24% dyslipidemia, 16% atrial fibrillation, 12% enolism, 8% diabetes, 24% oral anticoagulants and 16% anti-platelet agents. We found no statistical significance when comparing these variables with early BD.

The use of osmotic diuretics ($p=0,002$), neuromuscular bloking ($p=0,004$) and barbiturates ($p=0.05$) were related to a late BD.

The average volume of intracerebral haemorrhages was 51 ml IC (34,4-67,6). The average displacement of midline of the brain was 8,9mm IC (6,8-11) and the average optic nerve sheath diameter measured at 3 mm from the optic disc was 6,4 mm IC (6,1-6,5) and at 10 mm 4,6 (4,5-4,8) being similar in both eyes. We found no statistical significance when comparing these variables with early BD.

The partial obliteration of basal cisterns, sulci and ventricles effacement was not related to early BD. A complete obliteration of basal cisterns on CT scan (82% of the patients dyed in < 48h, $p=0.016$) and the loss of cortic-subcortical differentiation ($p=0,029$) were statistically significant. The presence of 4 of these radiological sings were also related to BD ($p=0,05$).

CONCLUSIONS.

1) There is no statistically significant relation between clinical variables assessed and the early evolution towards BD.

2) A complete obliteration of basal cisterns, the loss of cortic-subcortical differentiation and the presence of 4 radiological sings were related to BD

011 - ENTROPY - GUIDED DEPTH OF HYPNOSIS ON GENERAL ANAESTHESIA IN CRITICALLY ILL POLYTRAUMA PATIENTS

A.F. Rogobete¹, O.H. Bedreag¹, D. Sandesc¹

¹Victor Babes University of Medicine and Pharmacy, Anesthesia and Intensive Care, Timisoara, Romania

INTRODUCTION. A high percentage of polytrauma patients require surgery within the first 24 hours to stabilize primary traumatic injuries. One of the main intraoperative complications in this type of patients is due to hemodynamic instability. Thus, it is necessary to implement multimodal monitoring involving both hemodynamic monitoring and monitoring of general anesthesia.

OBJECTIVES. The objectives of this study were to identify the possible implications of Entropy monitoring on hemodynamic stability in critically ill polytrauma patients.

METHODS. Prospective Observational Study, Deployed in the Clinic of Anesthesia and Intensive Care, Emergency County Hospital "Pius Brinzeu" Timisoara, Romania. ClinicalTrials.Gov Identifier. There were two groups, Group A (N = 37), in which the depth of hypnosis was monitored through Entropy (GE Healthcare, Helsinki, Finland) and Group B (N = 35).

RESULTS. The incidence of hypotension and tachycardia episodes was statistically significantly lower in Group A, unlike the control group ($p < 0.05$). Moreover, a statistically significant ($p < 0.05$) consumption of inhaled anesthetic agent was recorded in Group A compared with Group B. Consumption of vasopressor was also lower in Group A ($p < 0.0001$, difference between means 0.960 ± 0.063 , 95% confidence interval 0.8334 - 1.0866).

CONCLUSION. Deploying monitoring for the depth of hypnosis in general anesthesia using Entropy can significantly increase the hemodynamic stability of critically ill polytrauma patients.

012 - NEUTROPHIL-TO-LYMPHOCYTE RATIO AS A PREDICTOR OF POOR PROGNOSIS AFTER INTRACEREBRAL HAEMORRHAGE

A. Ramos¹, A. Dogliotti², D. Latasa¹, F. Acharta¹, J. Toledo³, C. Oitana¹, F. Gerber¹, L. Lovesio¹, A. Ugolini⁴, C. Lovesio⁵

¹Sanatorio Parque, Critical Care, Rosario, Argentina, ²Sanatorio Parque, Statistics and Epidemiology, Rosario, Argentina, ³Sanatorio Parque, Neurosurgery, Rosario, Argentina, ⁴Sanatorio Parque, Internal Medicine, Rosario, Argentina, ⁵Sanatorio Parque, Critical Care Director, Rosario, Argentina

INTRODUCTION. Inflammation plays a central role in secondary brain injury. Neutrophil-to-lymphocyte ratio (NLR) is an inflammation marker. The aim was to assess the relationship between NLR and poor outcome.

METHODS. Between January 2007 and October 2017, 102 patients with supra-tentorial ICH within 24 hours of onset of symptoms were admitted. On admission we recorded patient characteristics, clinical and laboratory findings, radiologic features and functional neurologic outcome. Poor outcome was defined as a Glasgow Outcome Scale (GOS) ≤ 3 at hospital discharge. The logistic regression model was used to identify if NLR was independently associated with poor outcome, including variables which showed a p value ≤ 0.2 and NLR regardless of the value of p.

RESULTS. From 102 patients admitted to intensive care unit due to acute ICH, 71 presented a poor outcome. Multivariate model was constructed by: APACHE II (p = 0.01), age (p = 0.05), Glasgow Coma Scale (p < 0.001), white blood cells counts elevated (p = 0.02), hyperglycaemia (p < 0.001), hypomagnesemia (p = 0.17), NLR (p = 0.34) and normal pupils (p = 0.04). There was no relation between NLR and poor outcome (p = 0.55) in the multivariate model. Instead, we found an association between hyperglycaemia and older age with the end point (p = 0.02 and 0.04, respectively).

CONCLUSION. We found no relationship between NLR and poor outcome in patients with ICH.

013 - EPIDEMIOLOGY AND OUTCOMES OF TRAUMA VICTIMS BY VIOLENCE ADMITTED TO THE ICU OF A UNIVERSITY HOSPITAL

T.T. Chung¹, G.F. Pogorzelski², T.A.A.L. Silva², T. Piazza², T.M. Lacerda², P.A.D. Duarte¹

¹Hospital Universitario do Oeste do Parana, General ICU, Cascavel, Brazil, ²Hospital Universitario do Oeste do Parana, Cascavel, Brazil

INTRODUCTION. Despite being a major cause of hospital admissions and have manifold complications and high mortality rates, data on ICU admissions by trauma (especially by violence) are scarce in developing and low-income countries, where its incidence has been increasing.

OBJECTIVES. To study the epidemiology of patients with trauma due to violence that were admitted in an ICU of a public teaching hospital.

METHODS. Retrospective cohort study, based on the medical records of patients admitted for trauma in the adult ICU of a 173-beds public university hospital, throughout the year 2012.

RESULTS. Of 147 trauma patients hospitalized in the ICU of a University Hospital in the year 2012, 45 (30.6%) had violence as a mechanism of trauma. They were subdivided in firearm injuries (FAI) (60%), stab injuries (SI) (15.5%) and aggression/beatings (24.5%). The main topographies of the trauma were chest (44.4%) and abdomen (40%), followed by neurocranium (35.5%) and upper limbs (17.8%). The mean age of these patients was 30.9 years and 91.1% were male. About half of these patients (48.9%) had a Glasgow coma scale (GCS) higher than 13 at admission, revealing a higher incidence of mild neurological trauma. The victims of aggression/beatings predominantly suffered brain trauma injury (BTI) (90.9%) and presented, on admission, the worst mean on the GCS (7.3). FAI and SI occurred mainly in the thoracoabdominal region.

About the complications presented, 46.7% had ARDS (acute respiratory distress syndrome), with mean time on mechanical ventilation (MV) of 7.8 days. 25.5% developed acute renal failure (ARF) and of this subgroup, 41.7% needed hemodialysis. The mean ICU stay was 9.8 days, with a mortality rate of 20.0%.

CONCLUSION. The prevalence of injuries due to violence was significant, with high morbidity and mortality, particularly victims of aggression/beatings. The incidence of respiratory and renal complications is very high in this group.

014 - METABOLIC BRAIN PATTERN IN VEGETATIVE STATES.

I. Astola¹, L. Alvarez García¹, L. Forcelledo¹, B. Quindós¹, L. López Amor¹, R.M. Rodríguez García¹, P. Recena¹, O. Leizaola¹, L. Viña¹, D. Escudero¹, Grupo de Investigación en Microbiología Traslacional del Instituto de Investigación Sanitaria del Principado de Asturias (ISPA).

¹Hospital Universitario Central de Asturias, Intensive Care Unit, Oviedo, Spain

INTRODUCTION. The diagnosis of the vegetative state (VS) is difficult, around 40% of the diagnoses being erroneous. The 18F-2-fluoro-deoxy-D-glucose positron emission tomography/computed tomography (18F-FDG PET/CT) allows the study of brain activity, the brain uptake of this radiotracer is related to intracellular glucose transport and therefore represents an in vivo measurement of neuronal integrity.

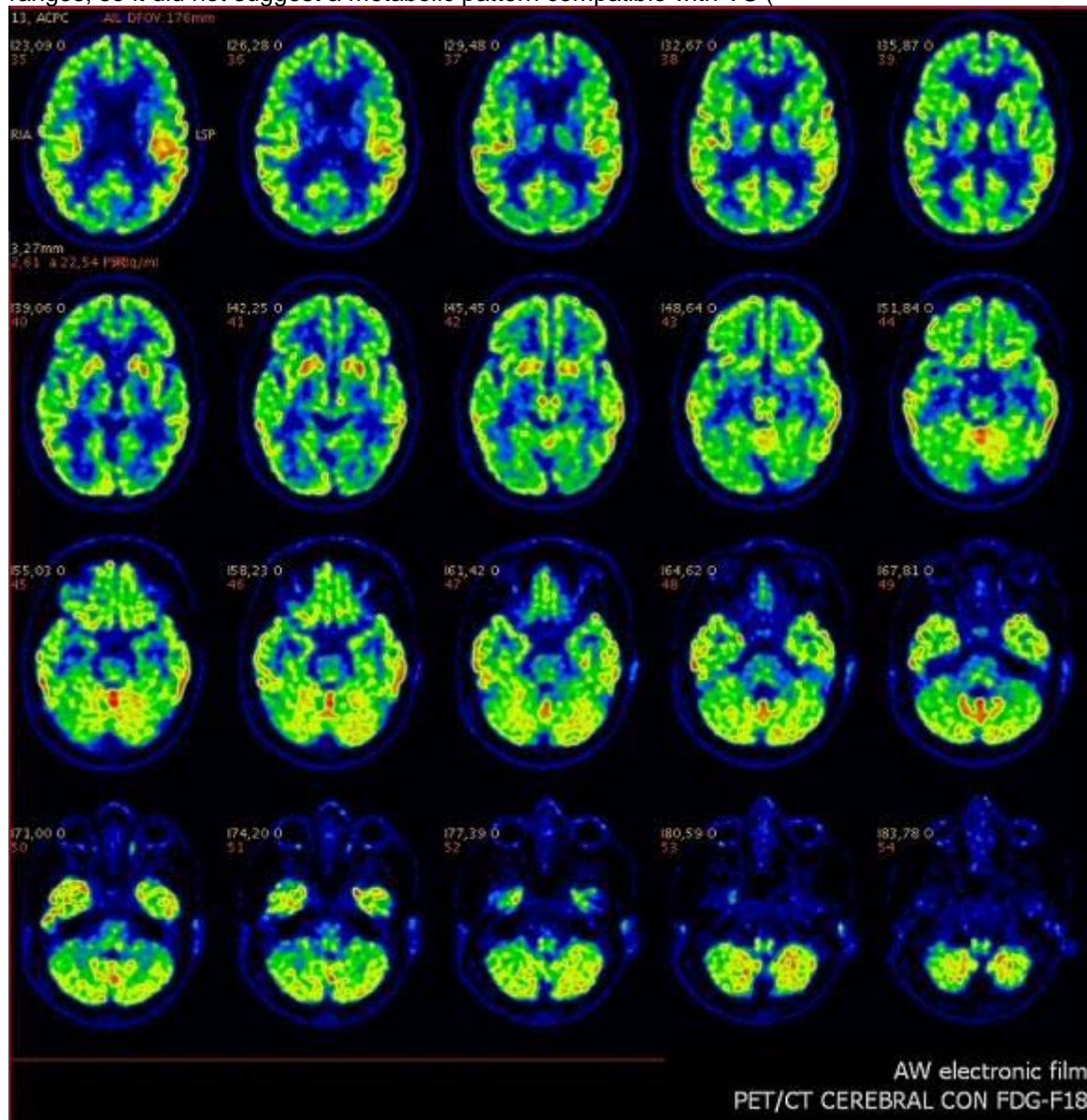
METHODS. 2 clinical cases where 18F-FDG PET/CT helped with the diagnosis.

RESULTS.

Case 1: 16-year-old man admitted in ICU after cardiac arrest due to electrocution and anoxic encephalopathy that caused a dystonic status (DS) due to an encephalomalacia of *Globus pallidus*. DS was difficult to control and required sedation a neuromuscular blockade and did not allow to assess the level of consciousness.

Short latency (N20) and long latency (N70) Somatosensory Evoked Potentials (SSEP) were performed obtaining bilateral cortical response.

18F-FDG PET/CT was performed; the metabolism of the fronto-parietal cortex was within normal ranges, so it did not suggest a metabolic pattern compatible with VS (



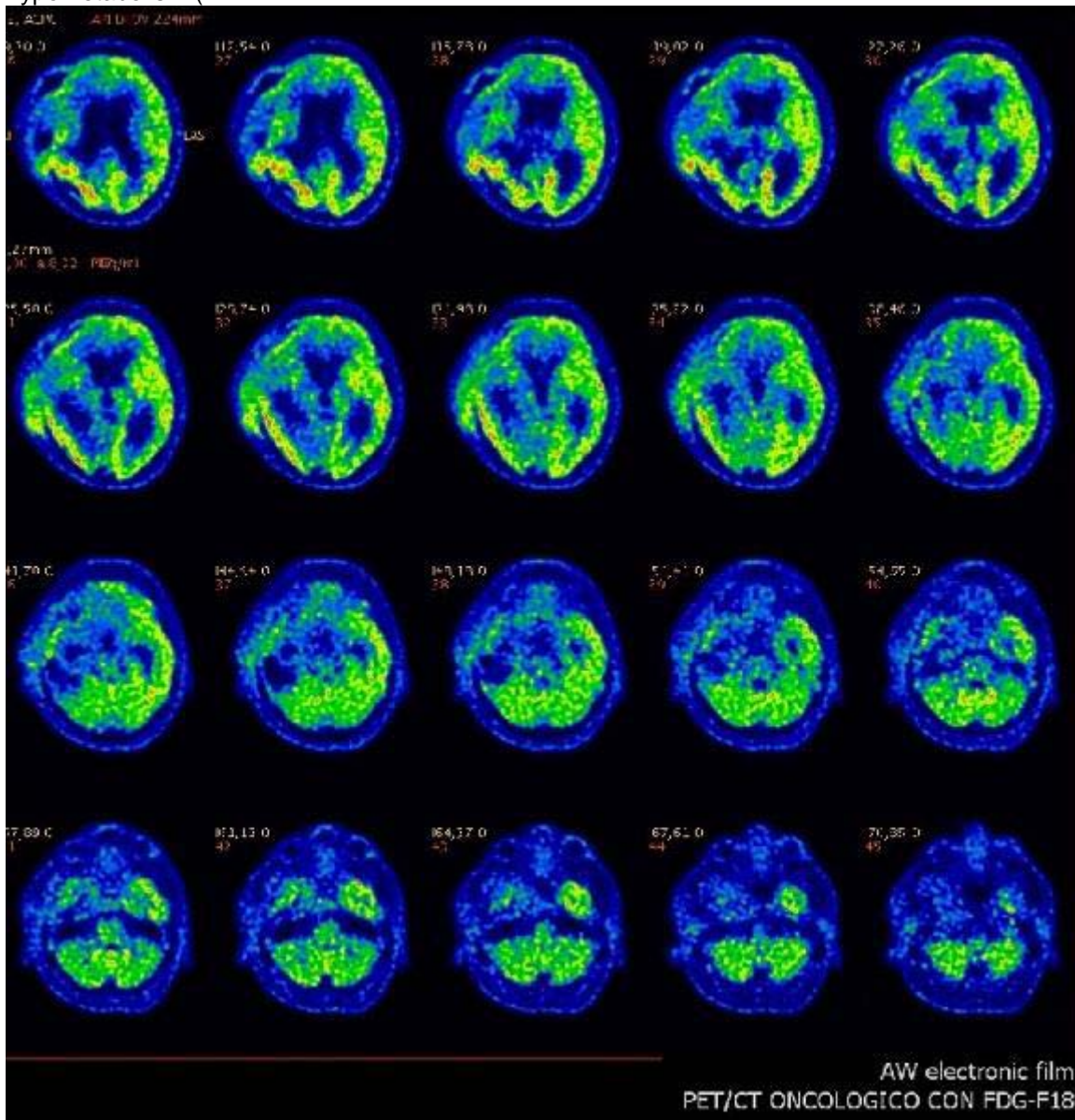
[Normal glucose consumption at cerebral cortex.]

). With this result, we decided to continue with the treatment and control of the DS requiring 11-months ICU stay.

Once the DS was controlled, the patient awakens fully oriented and collaborative, preserving cognitive functions.

Case 2: 44-year-old man admitted in ICU on GCS 4 and left anisocoria secondary to subdural hematoma of the right convexity. Emergent surgery was performed to evacuate the hematoma and decompressive craniectomy. It evolves unfavorably with intracranial hypertension. After resolution of the cerebral edema, the clinical examination was compatible with VS. SSEP (N20) was performed with absence of cortical response.

18F-FDG PET/CT was performed with the interest of seeing the correlation of cerebral metabolism with neurological examination and SSEP. 18F-FDG PET/CT proved marked frontoparietal hypometabolism (



[Cerebral hypometabolism.]

). 17 months later, the patient continues in a vegetative state.

CONCLUSIONS.

- On VS, cerebral hypometabolism is proved on 18F-FDG PET/CT (Case 2). Although we do not have the experience to confirm the diagnosis through this test, it seems useful to rule it out in situations where exploration is not possible (Case 1).
- Its usefulness seems promising, if the brain hypometabolism patterns are finally correlated with the

exploration and the SSEP.

015 - SIGNIFICANCE OF PROCALCITONIN IN PATIENT WITH NON TRAUMATIC SUBARACHNOID HEMORRHAGE AND INTRACEREBRAL HEMORRHAGE

A. Gupta¹, R. Shurtliff², L. Gupta²

¹OhloneCollege, Fremont, United States, ²Regional Medical Center of San Jose, San Jose, United States

BACKGROUND. Procalcitonin is a known biomarker for sepsis. We are trying to evaluate the significance of procalcitonin in differentiating infectious vs non infectious causes of fever

METHODS. 271 patients with subarachnoid hemorrhage and intracerebral hemorrhage were studied retrospectively from September 2014 to September 2017 Procalcitonin levels, leucocytosis and degrees of fever were noted for each of these patients. PCT were measured on day 2 and day 5 after admission.

DataOn admission, the average level of PCT was higher in patients with positive blood cultures, respiratory cultures and urine cultures. we also found lower levels of procalcitonin in patients with non infectious causes of fever - drug related, and fever secondary to hemorrhage.

RESULTS. We hence recommend to measure procalcitonin in patients with febrile illness in subarachnoid and intracerebral hemorrhage to assist in differentiating infectious vs non-infectious causes of fever

CONCLUSIONS. Measuring procalcitonin levels in patients with SAH and ICH can be used to predict cause of fever in neurocritical care unit.

016 - SERUM CALCIUM LEVEL AS A PREDICTOR OF NEUROLOGICAL DETERIORATION SECONDARY TO HEMATOMA EXPANSION IN PATIENTS WITH SPONTANEOUS INTRACEREBRAL HEMORRHAGE

A. Ramos¹, A. Dogliotti², M. Perezlindo¹, D. Latasa¹, J. Toledo³, F. Acharta¹, U. Antonella⁴, L. Lovesio¹, C. Lovesio⁵

¹Sanatorio Parque, Critical Care, Rosario, Argentina, ²Grupo Oroño, Statistics and Epidemiology, Rosario, Argentina, ³Sanatorio Parque, Neurosurgery, Rosario, Argentina, ⁴Sanatorio Parque, Internal Medicine, Rosario, Argentina, ⁵Sanatorio Parque, Rosario, Argentina

INTRODUCTION. Intracerebral hemorrhage (ICH) is a principal cause of early neurological deterioration secondary to hematoma expansion. Calcium is a cofactor of the coagulation cascade. The objective of this study was to assess the relationship between serum calcium level at admission with neurological deterioration due to hematoma expansion.

METHODS. Between January 2007 and October 2017, 102 patients diagnosed with supra-tentorial ICH within 24 hours of symptoms were admitted. On admission data including patient characteristics, clinical and laboratory findings and radiologic features were assessed and further analysed. Neurological deterioration due to hematoma expansion was defined as a decrease of two points in the Glasgow Coma Scale and an increase of ≤ 6 ml in the hematoma volume.

The logistic regression model was used to identify if serum calcium level was independently associated with neurological deterioration. We included in the analysis variables which showed a value of $p \leq 0.2$.

RESULTS. From 102 patients admitted to intensive care unit because of acute ICH, 9 presented neurological deterioration secondary to hematoma expansion. Multivariate model was constructed by: female gender ($p=0.1$), history of diabetes ($p=0.09$), antiplatelet therapy ($p=0.16$), systolic blood pressure ($p=0.006$), ICH score ($p=0.1$), pupils abnormalities ($p=0.19$) and serum calcium level ($p=0.001$). There was any relationship between serum calcium levels and neurological deterioration secondary to hematoma expansion ($p=0.18$).

CONCLUSION. We found no relationship between serum calcium levels and neurological deterioration secondary to hematoma expansion in patients with supra-tentorial ICH.

017 - EFFICIENCY OF COMPUTED TOMOGRAPHY IN EVALUATING TRAUMATIC BLEEDING SEVERITY SCORE IN THE HYBRID EMERGENCY ROOM: A SINGLE CENTER RETROSPECTIVE COHORT STUDY

T. Yamagishi¹, K. Sugiyama², K. Shibahashi², Y. Ohkura², H. Hoda², H. Fujita², Y. Hamabe²
¹Saitama Citizens Medical Center, Division of General Medicine, Saitama, Japan, ²Tokyo Metropolitan Bokutoh Hospital, Tertiary Emergency Medical Center, Tokyo, Japan

INTRODUCTION. The Traumatic Bleeding Severity Score (TBSS) and modified TBSS were developed in Japan and are useful models in predicting the need for massive transfusion (MT) in patients with major trauma. Recently, whole-body computed tomography (CT) scan has demonstrated efficiency as a diagnostic tool in early trauma care.

OBJECTIVES. The purpose of this study was to evaluate the TBSS and modified TBSS using CT (RBSS-CT and modified TBSS-CT, respectively) instead of focused assessment with sonography in trauma (FAST) and radiography as part of the TBSS and modified TBSS in the hybrid emergency room (ER) (where interventional radiology-CT system was installed and CT could be performed immediately).

< Methods>Patients with trauma (N=384) treated at the hybrid ER between August 2014 and July 2015 were included in the study. Patients younger than 18 years, who were transferred from other hospitals, had experienced an out of hospital cardiac arrest, penetrating trauma, and solely traumatic brain injury were all excluded. The TBSS-CT and modified TBSS-CT were calculated,

Variables	Value	Points
① Patient's Age (years)	$\leq 59, \geq 60$	0, 6
② Systolic Blood Pressure (mmHg)	$\geq 110, 100 \leq < 110, 90 \leq, < 100, < 90$	0, 4, 8, 12
③ CT (pericardium, bilateral thorax, perihepatic, perisplenic and suprapubic view)	Number of regions	Number regions \times 3
④ Pelvic Fracture (AO)	TypeA, TypeB, TypeC	3, 6, 9
⑤ Lactate Concentration (mmol/L)	$0 \leq < 2.5, 2.5 \leq < 5.0, 5.0 \leq < 7.5, 7.5 \leq$	0, 4, 8, 12
Systolic blood pressure: after rapid infusion of 1,000 mL crystalloid (TBSS-CT) or on arrival (modified TBSS-CT), AO: Arbeitsgemeinschaft fur Osteosynthes Fragen/ Orthopedic Trauma Association classification, CT: computed tomography.		

[Clinical application of the TBSS, modified TBSS-CT]

and the Trauma Associated Severe Hemorrhage (TASH) score were also calculated for comparison. Area under the receiver operating characteristic curves (AUROC) were compared with these scoring systems. The time intervals from patient arrival to performing CT and delivering blood sample to the laboratory were also extracted to estimate the time taken to calculate these scores.

RESULTS. A total of 248 patients were included in the analysis. The median TBSS-CT was significantly greater in patients who received MT than in those who did not (14 vs. 4; $p < 0.001$). The median

modified TBSS-CT showed a similar trend (21 vs. 4; $p < 0.001$). The AUROCs of TBSS-CT, modified TBSS-CT and TASH score were 0.826, 0.881 and 0.897, respectively.

	TASH score	TBSS-CT	Modified TBSS-CT
AUROC	0.897	0.826	0.881
	cutoff: 7	cutoff: 10	cutoff: 10
Sensitivity	88.2%	76.5%	82.4%
Specificity	87.1%	81.9%	79.7%
Positive predictive value	34.0%	24.1%	23.4%
Negative predictive value	99.0%	97.9%	98.4%

[AUROC for estimating the ability to predict MT.]

The median time from patient arrival to CT was 18 minutes (interquartile range [IQR], 15-23), and the median time of 21 minutes (IQR, 18-25) was taken to deliver blood sample to the laboratory upon arrival at the ER.

CONCLUSIONS. The modified TBSS-CT is equivalent to the TASH score in predicting the need for MT. Furthermore, the modified TBSS-CT could be calculated sooner than the TASH score.