Predictive value of scoring system in severe pediatric head injury

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Key words: *pediatric head trauma; Glasgow Coma Scale, Pediatric Trauma Score; Glasgow Outcome Scale, Pediatric Index of Mortality 2.*

Summary. *Objectives. To determine the threshold values of Pediatric Index of Mortality 2 (PIM 2) score, Pediatric Trauma Score (PTS), and Glasgow Coma Scale (GCS) score for mortality in children after severe head injury and to evaluate changes in outcomes of children after severe head injury on discharge and after 6 months.*

Material and methods. All children with severe head injury admitted to the Pediatric Intensive Care Unit of Kaunas University of Medicine Hospital, Lithuania, from January 2004 to June 2006 were prospectively included in the study. The severity of head injury was categorized according to the GCS score ≤8.

As initial assessment tools, the PTS, postresuscitation GCS, and PIM 2 scores were calculated for each patient. Outcome was assessed according to Glasgow Outcome Scale on discharge and after 6 months.

Results. The study population consisted of 59 children with severe head injury. The group consisted of 37 (62.7%) boys and 22(37.3%) girls; the mean age was 10.6±6.02.

The mean GCS, PTS, and PIM 2 scores were 5.9±1.8, 4.8±2.7, and 14.0±19.5, respectively. In terms of overall outcome, 46 (78.0%) patients survived and 13 (22.0%) died.

All three scales appeared to be significant predictors of death. Threshold values for which potential mortality in children after severe head injury increased were 10.75 for PIM 2, 3 for PTS and 5 for GCS. PIM 2 score provided the best discrimination between survivors and nonsurvivors.

Conclusions. The threshold values for mortality in children after severe head trauma were PIM 2≥10.75%, PTS≤3 and GCS≤5, and these values were significant risk factors of death in severely head injured children. The changes in outcome for survivals on discharge and after 6 months were statistically significant.

Introduction

Trauma remains one of the most important diseases of childhood, accounting for serious, potentially life-long morbidity and representing the most likely cause of death after the first year of life in developed nations (1, 2).

Even when less developed nations are included, with proportionally more deaths as a result of infectious diseases and inadequate sanitation, in 2001 injuries accounted for 38.8% of all deaths in children younger than 19 years in Eastern Europe (1). Head trauma is one of the most common injuries in childhood. More than 80% of theses injuries are mild, but traumatic brain injury is the leading cause of death due to trauma in children (3).

Accidents among youths are a substantial public health problem in Lithuania as well as in other countries. Approximately 150 of Lithuanian children younger than 14 years die from unintentional and intentional injuries each year. Mortality from external causes is several times higher in Lithuania than in most European countries. Population-based studies indicate that approximately 25% of children and adolescents younger than 19 years receive medical care for an injury each year. Out of these, 2.5% require hospitalization, and in 55% of cases, injuries result in at least temporary disability (4).

Early recognition of factors predicting outcome is important for quality assessment and could contribute to a more selective management of the most severe

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injuries (5).

For patient's evaluation after severe head trauma, several scores such as Pediatric Trauma Score (PTS), Glasgow Coma Score (GCS), and Pediatric Index of Mortality 2 (PIM 2) can be used.

Trauma scoring systems have played a pivotal role in the development of trauma care over the past 20 years; yet, these remain poorly understood by many emergency physicians (6).

Understanding and suitable use of trauma scoring system together with the use of specific guidelines for treatment can make a significant contribution to improving the prognosis of children after severe head injury.

The aim of the study

The aim of the study was to determine the threshold values of PIM2, PTS, and GCS for mortality in children after severe head injury and to evaluate changes in outcomes of children after severe head injury on discharge and after 6 months.

Materials and methods

The study was performed with the permission of the Ethical Committee of Kaunas University of Medicine (No. BE-2-46; 21/09/2005).

All children with severe head injury admitted to the pediatric intensive care unit (PICU) of Kaunas University of Medicine Hospital (KUMH), Lithuania, from January 2004 to June 2006 were prospectively included in the study. The severity of head injury was categorized according to the Glasgow Coma Scale – scale score ≤8 indicated severe head injury (7).

The study included 59 children with severe head injury; there were 37 (62.7%) boys and 22 (37.3%) girls. The mean age was 10.6 years (range from 2.4 months to 18 years).

Most injuries were due to road traffic accidents (47, 79.7%) and falls (9, 15.3%); 2 (3.4%) children were beaten by other people, 1 (1.7%) was hit by a horse. Only 16 (27.1%) patients were transported directly to our PICU from the accident scene. The majority – 43 (72.9%) – originated from the outlying hospital and were transferred by the pediatric transport team from our PICU. The mean admission time (time from the accident to arrival in the PICU) was 6.5±7.4 hours and was longer in patients initially managed in regional hospital, than in patients directly transferred to our PICU (8.2±7.9 *vs.* 2.3±2.7 hours, respectively; P<0.01).

As initial assessment tools, the Pediatric Trauma Score (6, 8) postresuscitation Glasgow Coma Scale

(6, 7), and Pediatric Index of Mortality 2 (9–12) were estimated for each patient. GCS and PTS were calculated on arrival to the first hospital. PIM 2 score for each patient was calculated from the information collected at the time a child was admitted to PICU of KUMH or recorded at the time of the first face-to-face contact between the patient and a doctor from a special pediatric transport team from PICU of KUMH in case of transporting the patient from the regional hospital.

For children younger than 1 year, Pediatric Glasgow Coma Scale (PGSC) was applied instead of GCS. Only verbal response subscale of PGSC is different from GSC (Table 1).

The six variables of the PTS are following: a) weight, b) airway, c) systolic blood pressure (SBP), d) loss of consciousness (LOC), e) open wounds, and f) skeletal injuries. Each element is scored from +2 (normal) to –1 (most severe injuries). A higher score on the PTS indicates a less injured patient. Patients scoring ≤8 are optimally treated at a level 1 pediatric trauma unit. Critics have also pointed out that the PTS suffers from scoring ambiguity. For example, the term "obtunded" when used to describe a child, could be interpreted in a number of ways. Such ambiguity lends itself to misinterpretation and inadequate scoring (6).

To avoid the misinterpretation in our study, the term "obtunded" was stated if the child has or had any deterioration of consciousness any time after injury.

PIM 2 score is calculated from the information collected at the time a child is admitted to the PICU. The nine variables of PIM 2 are following: 1) systolic blood pressure, 2) pupillary reactions, 3) blood oxygenation, 4) base excess in capillary or arterial blood, 5) mechanical ventilation at any time during the first hour in PICU, 6) elective admission to PICU, 7) recovery from surgery, 8) admitted following cardiac bypass, 9) high-risk diagnosis. Because PIM 2 describes how ill the child was at the time intensive care was started, the observations to be recorded are those made at or about the time of the first face-to-face (not telephone) contact between the patient and a doctor from the intensive care unit (or a doctor from a specialist pediatric transport team). The first value of each variable measured within the period from the first contact to 1 hour after arrival in the PICU is used. The first contact may be in the PICU, the emergency department, a ward in the hospital, or in another hospital (*e.g.* on a retrieval). If information is missing (*e.g.* base excess is not measured) record zero, except for systolic blood pressure, which should be recorded as 120 (13).

Table 1. Comparison of Glasgow Coma Scale and Pediatric Glasgow Coma Scale

Glasgow Coma Scale	Pediatric Glasgow Coma Scale	Score
Variable	Variable	
1. Eye opening	1. Eye opening	5
Spontaneous	Spontaneous	4
To voice	To voice	3
To pain	To pain	2
None	None	1
2. Verbal response	2. Verbal response	
Oriented	Appropriate words or social smiles, fixes on and follows objects	5
Confused	Cries but is consolable	4
Inappropriate words	Persistently irritable	3
Incomprehensible sound	Restless, agitated	2
None	Silent	1
3. Motor response	3. Motor response	
Obeys commands	Obeys commands	6
Localizes pain	Localizes pain	5
Withdraw (pain)	Withdraw (pain)	4
Flexion (pain)	Flexion (pain)	3
Extension (pain)	Extension (pain)	2
None	None	1

PIM 2-based mortality index was evaluated based on the regression equation as published in the literature (9).

All patients were treated according to the protocol of management of severe head injury, which is based on intracranial pressure (ICP)-targeted therapy (11) and a set of guidelines for the acute management of severe traumatic brain injury in infants, children, and adolescents (12). ICP was measured in 34 (55.7%) cases.

The outcome was assessed at the time of discharge from the hospital and 6 months after the trauma using the Glasgow Outcome Scale (GOS) (14–16). The method of follow-up used was a telephone interview. A GOS score of 1 was assigned to the children who died; a GOS score of 2, to the children who demonstrated persistent vegetative state with no obvious cortical function; a GOS score of 3, for severe disability (conscious but disabled); a GOS score of 4, for a moderate disability or mild neurological defect (disabled but independent); and GOS score of 5, for good recovery (completely healthy child).

Statistical analysis

Statistical analysis of the data was performed by using SPSS 12 software package. Data are expressed as mean ± standard deviation (SD) or median (inter-quartile range) as appropriate.

Significance level of 0.05 was chosen for testing statistical hypothesis. After testing for normality, parametric and nonparametric criteria, the Student's t, ANOVA, and Mann-Whitney U and Kruskal-Wallis tests were used to compare two or more groups.

We used receiver operating characteristic curves (ROC curves) (17) to determine the threshold value in which the risk of outcome (survives or dies) changes.

Having the threshold values of the scales, we evaluated their sensitivity, specificity, and odds ratio.

The marginal homogeneity test was used for detection of the changes in GOS scores for survival on discharge and after 6 months.

Results

Descriptive statistics and comparison for survivors and nonsurvivors are shown in Table 2. We can see that the changes in groups are statistically significant for all three scales (P<0.01).

ROC curves illustrate the relationship between sensitivity and specificity in determining the predictive value for death after severe traumatic brain injury (Fig. A, B, C).

Using the ROC curves, we determined that threshold values for which potential mortality in children after severe head injury changed were PIM 2≥10.75%, PTS≤3, GCS≤5. Our study showed that PIM 2≥10.75%,

***Table 2.* Comparison of PIM 2, PTS, and GCS scores between groups of survivors and nonsurvivors**

Score system	Survivors (n=46)		Nonsurvivors (n=13)		P
	median	interquartile range	median	interquartile range	
PIM 2	5.6	3.5	36.0	56	<0.01
PTS	6.0	3.0	3.0	5	<0.01
GCS	7.0	3	4.0	5	<0.01

PIM 2 – Pediatric Index of Mortality 2; PTS – Pediatric Trauma Score; GCS – Glasgow Coma Scale.

PTS≤3, GCS≤5 are significant risk factor for death in children after severe head injury. Area under the curve was 0.749 for PTS, 0.82 for PIM 2, 0.74 for GCS; sensitivity and specificity for each of the scores were as follows: 0.64 and 0.85; 0.71 and 0.93; 0.79 and 0.67. Odds ratios (OR) for PIM 2≥10.75% were 13.2; for PTS≤3, 10.0; for GCS≤5, 7.5.

GCS shows the highest sensitivity for death (0.79), and PIM 2 is the most specific for survival (0.93) (Table 3).

In terms of overall outcome, 46 (78.0%) patients survived and 13 (22.0%) died.

One child demonstrated persistent vegetative state (GOS=2) on discharge, and after 6 months, his condition did not change. Data about outcome after 6 months of one patient was lost. These two patients were excluded from further calculations. The changes in outcome on discharge and after 6 months were evaluated in 44 patients.

As we can see from cross-tabulation table for outcomes of survived patients on discharge and after 6 months (Table 4), severe disability was applied to 16 children on discharge and only 2 (12.5%) children after 6 months. From 18 patients with moderate disability on discharge all 18 showed good recovery after 6 months. Marginal homogeneity test showed a statistically significant improvement after 6 months (P<0.001).

Discussion

This study was an attempt to identify the markers of unfavorable outcome within the first few hours of admission and to evaluate their relative importance in predicting the outcome.

Trauma scoring systems can be classified into physiological, anatomical, and combined systems (6).

***Table 3.* Association of PIM 2, PTS, and GCS scores with outcome of children after severe head injury**

Score system	Threshold value	Sensitivity	Specificity	OR	95% CI	
					lower	upper
PIM 2	≥10.75	0.71	0.93	13.2	3.1	56.6
PTS	≤3	0.64	0.85	10.0	2.6	39.0
GCS	≤5	0.79	0.67	7.6	1.8	31.3

PIM 2 – Pediatric Index of Mortality 2; PTS – Pediatric Trauma Score; GCS – Glasgow Coma Scale; OR – odds ratio; CI – confidence interval.

***Table 4.* Distribution of outcomes for survivals on discharge and after 6 months**
(Glasgow Outcome Scale on discharge and Glasgow Outcome Scale after 6 months. Cross-tabulation)

Glasgow Outcome Scale after 6 months / Glasgow Outcome Scale on discharge	Severe disability	Moderate disability	Good recovery	Total
Severe disability	2	11	3	16
Moderate disability	0	0	18	18
Good recovery	0	0	10	10
Total	2	11	31	44

A

ROC curve for PTS
Area under the curve 0.749
Sensitivity 0.64
Specificity 0.85
Threshold value for increased risk
for mortality: PTS=3

B

ROC curve for PIM 2
Area under the curve 0.82
Sensitivity 0.71
Specificity 0.93
Threshold value for increased risk
for mortality: PIM 2=10.75%

C

ROC curve for GCS
Area under the curve 0.74
Sensitivity 0.79
Specificity 0.67
Threshold value for increased risk
of mortality: GCS=5

***Fig.* Receiver operating characteristic curves showing the relation between sensitivity and
1-specificity in determining the predictive value of the Pediatric Trauma Score (PTS) (A),
Pediatric Index of Mortality 2 (PIM 2) (B), and Glasgow Coma Scale (GCS) (C)**
ROC – receiver operating characteristic curve.

All three scores were clear predictors of death, with highly significant differences in the comparison of scores between survivors and nonsurvivors (P<0.001).

PIM 2 as a general severity of illness for pediatric patients score is not specifically developed for evaluating trauma patients. However, we used PIM 2 as a predictor of mortality for pediatric head trauma patients and showed that PIM 2 was superior to PTS and GCS for discrimination between survivors and nonsurvivors, as reflected by the higher OR (13.2 for PIM 2, 10.0 for PTS, and 7.6 for GCS)

In this study, we showed that PIM 2≥10.75%, PTS≤3, and GCS≤5 represented risk factors for death in children after severe head injury.

PTS is a combined trauma score. The PTS was developed to predict survival of injured children. Specifically designed for children, PTS incorporates elements similar to those evaluated for adult trauma victims. The PTS evaluates only three anatomical and three physiological components, making it simple and quick to use.

Tepas *et al.* in their study documented the direct linear relationship between PTS and injury severity and confirmed the PTS as an effective predictor of both severity of injury and potential for mortality already in 1988. The threshold value for PTS was 6 in this study (16). Other study performed in 1998 by Orliaguet *et al.* determined that the threshold value for mortality after severe injury was PTS≤4 (18). In 2001, Cantais *et al.* found that death was significantly associated with PTS<5 in severely traumatized children. The occurrence of head trauma significantly influenced the mortality rate (19).

The original publication of the Glasgow Outcome Scale in 1975 (14) reviewed the term already in use to describe survivors of severe head injuries. The aim of producing GOS was to have a limited number of exclusive categories that summarized the social capacity of the patient rather than listing specific disabilities (15).

Time of outcome assessment largely depends on the purpose for which this is being done. If mortality is the main measure sought then this may reasonably be assessed at the time of discharge from the facility providing acute care, as most deaths occur in the first week (15). Studies have shown that most patients have reached their final point on the 5-point outcome scale by 6 months. For this reason, many international studies are based on a 6-month outcome, which also proves to be an interval at which the majority of patients in a study can be successfully followed up (15).

The advantages of GOS include its ease at time of administration, as well as appropriateness for any age group (13). In the study, where GOS was used to evaluate short-term outcomes of pediatric polytrauma patients at 6 weeks, 3 months, 6 months, and 1 year following injury, children demonstrated an improvement in function over the 12-month period according to the GOS, with statistically significant differences found between 6 weeks and 3 months, and 3 and 6 months postinjury. These improvements appeared to slow over the next 6 months, with no statistically significant results seen between 6 and 12 months (13).

GCS and GOS were developed primarily to facilitate the assessment and recording of initial severity of brain dysfunction and of ultimate outcome in a multicenter study of outcome after severe brain damage. The aim was to use simple terms that could be readily understood by a wide range of observers, including doctors, nurses, and others (15). The most valid time to assess GCS for prognosis is therefore probably after resuscitation and stabilization. After resuscitation, however, many patients are often intubated and sedated, making assessment on the full scale then impossible. Clinicians vary in how they deal with this, but the motor score alone can remain useful in such circumstances (15). GCS is used as means of communication between different staff caring for the patients from the scene of accident through to the intensive care unit. Beyond the care of the patients, the GCS has been used to classify head-injured patients in epidemiological studies worldwide. Three grades of severity are recognized: severe (GSC 8 or less), moderate (GCS 9–12), and mild (GSC 13–15) (15).

Odebode and Abubakar also found the relationship between GCS and GOS in pediatric head trauma patients, but they did not determine the threshold value for the scale (20). Some of the authors (19, 21) use GCS as means of dividing pediatric head trauma patients into subgroups, founding the statistically significant difference of means in outcome of the divided subgroups. Ducrocg *et al.* found that threshold value of GCS score for death was 5 (22), but the authors did not define PTS as an independent predictor of death and poor outcome.

Some authors tried to define the predictive value of Injury Severity Score (ISS) (22) and find it to be an independent predictor of death after severe trauma; however, ISS is strictly anatomical trauma score and suits more for patients with multiple injuries, while PTS is a combined trauma score and besides it is adjusted for pediatric trauma patient's scoring. Moreover, the PTS is simple enough to be used for triage of pediatric trauma patients by any care providers,

whatever their level of proficiency. The calculation of this very simple index, which is very quick to perform, could be very useful in an emergency because it does not only predict the severity of injury, but it also identifies the children in immediate danger of dying without appropriate and timely intervention (19).

The threshold value of GCS score for death after severe head trauma was ≤5. In fact, in our study, we did not take into account brain ischemia or hypoxia-associated lesions, the absence of which can lead to good functional outcome even when the GCS score is 3–5 (19).

Of course, threshold values for poor outcome after severe pediatric head injury can vary dependently the differences of trauma system of the country, region, or institution, but in general, our study has shown that all the three trauma-scoring scales are good predictive agents in pediatric trauma scoring.

However, as PTS is easy to apply, it is recommended to use for triage purposes: according to our study, PTS≤3 requires immediate intervention, as the patient has a high risk of dying. For patients with PTS ≤8, transfer to the highest level pediatric or pediatric trauma center is necessary.

The question is, "What kind of scoring system do we need if we are to include children in clinical trials?" We probably need a score that represents well the patient's condition early after admission to the PICU. With this aim in mind, the PIM score appears superior to the PRISM (Pediatric Risk of Mortality) and PRISM III scores. PIM score takes into account the condition of the patient directly on arrival in the PICU (*e.g.* when the patient's condition is least affected by therapeutic interventions) (10).

The validity of the PIM rests on how well it does what it is developed to do: to predict death for patients who die and survival for those who live. The evaluation of the ability of a score to discriminate between these two populations is described by the area under ROC curve. One area where the PIM clearly outperformes the PRISM III is in ease of use. The PIM requires collection of only eight variables upon admission. The PRISM III requires collection of the most abnormal (highest and lowest) values of 17 physiological variables during the first 24 h after admission plus six additional risk factors. The labor required to collect the data is obviously greater with the PRISM III unless automated data collection systems are present. The authors of the PIM emphasize that the coefficients for the PIM are freely available, whereas use of the PRISM III requires payment of a fee (23).

As for PIM 2, it showed the best discrimination for survivals and nonsurvivals in our study. And two more advantages of this score are the early evaluation of patient's condition and its free accessibility for worldwide use, while some other pediatric mortality scores such as Pediatric Risk of Mortality (PRISM) score, though has good sensitivity and specificity to predict mortality (24), is pretty cumbersome and requires payment of a fee (23). Even the best scoring system cannot be used to predict individual outcome or to guide treatment in individual patients. On the other hand, PIM has eight variables, it is easy to collect, and the coefficients of the model were published in the literature some years ago (12).

GCS is widely used for clinical assessment and the changes of level of consciousness, for defining the severity of head trauma; it also can be used as a predictor of outcome in severe pediatric head trauma.

The GSC was first introduced in the 1970s to provide a simple reliable method of recording the level of consciousness of patients and monitor change. In essence, the GCS was developed to standardize the reporting of neurological findings and to provide an objective measure of the level of function of comatose patients. The GCS is one of the most common tools used by trauma care providers as it enables the gradation of head injury severity using simple observations rather than invasive or specialist techniques. In particular, the GCS is commonly used to predict patient's outcome following trauma. As for the prehospital setting, the motor component of the GSC alone was shown to be efficacious in predicting mortality following trauma (7).

The GCS was developed to standardize assessments of a patient's level of consciousness (LOC). Only three behavior elements are evaluated: a) motor, b) verbal, and c) eye opening. This makes GCS easy to use, even in prehospital setting. The GCS can assess the depth and predict the duration of coma. The GCS can be used to follow up the changes in LOC over time. The GSC has been modified for use with children, producing the Pediatric Glasgow Coma Scale for use with preverbal children (6).

Emergency physicians should be familiar with extant trauma scoring systems. The differences among systems should be taught in emergency medicine residencies (6).

It is very important to remember that intensive care mortality models should only be used in groups of patients; they should never be used to guide the management of an individual patient. It is sensible to use PRISM or PIM to compare the actual number of deaths

in your unit with the number predicted by one of the models, but not to decide that an individual patient is too sick to be worth treating (11).

Conclusions

1. The threshold values for mortality in children after severe head trauma were following: PIM $2\geq10.75\%$, PTS≤3, and GCS≤5, and these values were significant risk factors for death in children with severe head injury.

2. The changes in outcome for survivals on discharge and after 6 months were statistically significant.

Skalių, naudojamų būklės sunkumui įvertinti, prognostinė vertė vaikams, patyrusiems sunkią galvos smegenų traumą

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Raktažodžiai: vaikų galvos trauma, Glazgo komos skalė, vaikų traumų skalė, vaikų mirštamumo indeksas 2.

Santrauka. *Darbo tikslas.* Nustatyti kritines vaikų mirštamumo indekso 2 (PIM 2), vaikų traumų skalės (PTS) ir Glazgo komos skalės (GKS) reikšmes vaikams, patyrusiems sunkią galvos smegenų traumą, ir įvertinti vaikų, patyrusių sunkią galvos traumą, gydymo baigčių pokyčius išrašant iš gydymo įstaigos ir po šešių mėnesių.

Tyrimo medžiaga ir metodai. Prospektyviai tirti visi vaikai, gydyti Kauno medicinos universiteto klinikų Vaikų intensyviosios terapijos skyriuje nuo 2004 metų sausio iki 2006 metų birželio mėn. dėl sunkios galvos traumos. Galvos traumos sunkumas nustatytas remiantis Glazgo komos skale ≤8.

Visų hospitalizuotų vaikų būklė buvo vertinama remiantis vaikų traumos skale, Glazgo komos skale ir vaikų mirštamumo indeksu 2. Baigtys vertintos pacientus išrašant ir po 6 mėnesių naudojant Glazgo baigčių skalę (angl. *Glasgow Outcome Scale*).

Rezultatai. Tiriamųjų grupę sudarė 59 vaikai, patyrę sunkią galvos smegenų traumą. Iš jų 37 (62,7 proc.) berniukai ir 22 (37,3 proc.) mergaitės. Tiriamųjų amžiaus vidurkis – 10,6±6,02 metų.

Glazgo komos skalės, vaikų traumos skalės ir vaikų mirštamumo indekso 2 vidurkiai buvo šie: 5,9±1,8; 4,8±2,7; 14,0±19,5. Vertinant baigtis, 46 (78,0 proc.) pacientų išgyveno, 13 (33,0 proc.) mirė. Visos vertinimo skalės statistiškai reikšmingai prognozavo letalias baigtis. Kritinės vertinimo skalių reikšmių ribos, virš kurių potencialiai padidėja vaikų mirštamumo rizika, po sunkios galvos traumos buvo: PIM2$\geq$10,75; PTS$\leq$3; GKS$\leq$5. PIM2 geriausiai atspindėjo skirtumą tarp mirusių ir išgyvenusių pacientų.

Išvados. Nustatytos šios kritinės būklės vertinimo skalių reikšmės: PIM2$\geq$10,75 proc., PTS$\leq$3 ir GKS$\leq$5. Šios reikšmės buvo statistiškai reikšmingas mirties prognostinis veiksnys vaikams, patyrusiems sunkią galvos smegenų traumą. Išgyvenusių vaikų būklės pokyčiai, išrašant iš gydymo įstaigos ir praėjus šešiems mėnesiams po traumos, buvo statistiškai reikšmingi.

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