

EFFECTS OF MAGNITUDE AND DURATION OF SECONDARY INSULTS ON OUTCOME IN TRAUMATIC BRAIN INJURED PATIENTS.

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Introduction

Secondary insults occur frequently after traumatic brain injury (TBI) and have a deleterious influence on outcome.

Objectives

To examine the incidence and course of hypotensive (systolic blood pressure < 90mmHg) and hypoxic (SpO₂ < 90%) episodes in TBI patients and their relationship with 6-months outcome.

Materials and Methods

Multicenter data from 2261 patients admitted in 3 NeuroIntensive Care Units (NICUs) were prospectively collected from 1997 until 2012. Detailed prehospital, hospital admission and outcome data have been analyzed. Lost to follow up patients have been excluded from the database, leaving 2072 patients available for statistical analysis. We investigated the contribution of persistency of secondary insults (hypotension and hypoxia) from pre-hospital setting to admission on dichotomized outcome (Glasgow Outcome Scale (GOS); favorable = 4-5; unfavorable = 1-3). We described the magnitude of both hypotensive and hypoxic episodes. We define secondary insult courses comparing the record of the event at the scene of accident and at admission (sustained: in both settings; resolved: present at scene of accident, not at admission hospital; new event: no record in the prehospital setting, but only at admission hospital; never: no events).

Results

Results are summarized by Table 1.

	Course	N (%)	OUTCOME			ADMISSION MAP (mmHg)		ADMISSION PaO ₂ (mmHg)	
			Fav (N, %)	Unfav (N, %)	p value	Median (1 st - 3 rd quartile)	p value	Median (1 st - 3 rd quartile)	p value
Hypotension	Sustained	118 (6.1)	27 (22.9)	91 (77.1)	< 0.0001	54.2 (46.7 - 60.0)	< 0.0001	-	
	Resolved	275 (14.3)	110 (40.0)	165 (60.0)		86.7 (76.7 - 96.7)			
	New event	30 (1.6)	15 (50.0)	15 (50.0)		55.0 (49.2 - 60.9)			
	Never	1507 (78.0)	835 (55.4)	672 (44.6)		96.7 (86.7 - 106.7)			
Hypoxia	Sustained	34 (2.1)	9 (26.5)	25 (73.5)	< 0.0001	-		52.9 (47.1 - 56.3)	< 0.0001
	Resolved	426 (26.6)	163 (38.3)	263 (61.7)				174.1 (107.5 - 271.2)	
	New event	17 (1.1)	5 (29.4)	12 (70.6)				49.0 (42.5 - 51.5)	
	Never	1127 (70.2)	628 (55.7)	499 (44.3)				201.0 (135.0 - 284.0)	
Hypoxia & Hypotension	Sustained	11 (1.0)	1 (9.1)	10 (90.9)	< 0.0001	53.3 (46.6 - 60.0)	< 0.0001	55.0 (45.0 - 57.0)	< 0.0001
	Resolved	137 (12.2)	45 (32.9)	92 (67.1)		90.0 (76.7 - 100.0)		176.6 (98.4 - 278.5)	
	New event	2 (0.2)	0 (0.0)	2 (100.0)		54.2 (50.0 - 58.3)		48.5 (47.0 - 50.0)	
	Never	975 (86.6)	563 (57.7)	412 (42.3)		96.7 (88.3 - 106.7)		201.0 (136.9 - 281.8)	

Table 1. Magnitude and duration of secondary insults vs. outcome in TBI patients.

Discussion

Secondary insults are less frequent than described in the past but are still associated with worse outcome compared with no insults. The resolution of the prehospital secondary outcome before admission is associated with a less negative outcome, but the stigma of the insults still remains.