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Disorders of Consciousness in Patients after Craniocerebral Trauma on Individual Days of Hospitalization — Prospective Study

Zaburzenia przytomności u pacjentów po urazach czaszkowo-mózgowych w poszczególnych dobach hospitalizacji — badania prospektywne

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Abstract

Introduction. Disorders of consciousness are states in which there is a gradual limitation of contact (of a person) with the external environment, i.e. the surroundings. In this situation, the body becomes unresponsive to external stimuli. Disorders of consciousness in traumatic brain injury can take various forms, from mild concussion with brief loss of consciousness to severe brain damage leading to coma. Symptoms may include loss of consciousness, memory impairment, headache, nausea, vomiting, dizziness, balance problems, as well as changes in behavior and mood.

Aim. The aim of the study was to analyze the influence of variables on the occurrence of consciousness disorders in patients after craniocerebral injuries in individual days of hospitalization.

Material and Methods. The study was conducted among 100 patients hospitalized in the neurotraumatology department. The prospective study employed a diagnostic survey method, utilizing measurement techniques and a questionnaire. The Glasgow Coma Scale (GCS) was used to assess the level of consciousness impairment. The results were statistically analyzed, with $p<0.05$ considered statistically significant. Ethics Committee approval for the study was obtained.

Results. The analysis of our own research showed that there are no statistically significant differences in the mean results of the state of consciousness (GCS) between women and men on the day of admission to the hospital ($Z=0.163$; $p=0.163$), on the 3rd day of hospitalization ($Z=0.811$; $p=0.370$), on the 7th day of hospitalization ($Z=0.00$; $p=0.986$) and on the day of discharge ($Z=0.011$; $p=0.917$). It was found that the age of patients showed a negative correlation with the GCS scale results in all examined days of hospitalization. This correlation was statistically significant ($p<0.05$) for all measurements except admission ($p>0.05$). A statistically significant difference was found in the mean scores of the state of consciousness (GCS) depending on the cause of injury on the 3rd day of hospitalization ($H=3.207$; $p=0.016$) and on the 7th day of hospitalization ($H=3.390$; $p=0.012$). No significant differences were found on the day of admission ($p=0.200$) or on the day of discharge ($p=0.076$). There are statistically significant differences in the assessment of the level of consciousness (GCS) between the group of patients with comorbidities and the group without comorbidities on the day of hospital admission ($p=0.002$), on the 3rd day of hospital stay ($p=0.029$), and on the 7th day of hospitalization ($p=0.035$). However, the differences are not statistically significant on the day of hospital discharge ($p=0.095$).

Conclusions. The disturbances of consciousness occurring in patients after craniocerebral injuries during the individual days of hospitalization significantly evolve from severe disturbances (at the beginning of hospitalization) to mild or no disturbances on the day of discharge from the ward. The factors with the greatest influence on the change in the

degree of consciousness disturbances during individual days of hospitalization were the patient's age and the presence of comorbidities. **(JNNN 2025;14(2):68–75)**
Key Words: craniocerebral injuries, disorders of consciousness, Glasgow Coma Scale

Streszczenie

Wstęp. Zaburzenia przytomności to stany w których dochodzi do stopniowego ograniczenia kontaktu (osoby) ze środowiskiem zewnętrznym czyli otoczeniem. W sytuacji tej organizm nie reaguje na bodźce zewnętrzne. Zaburzenia przytomności w urazach czaszkowo-mózgowych mogą przybierać różne formy, od łagodnego wstrząśnienia mózgu z krótkotrwałą utratą przytomności, po ciężkie uszkodzenia mózgu prowadzące do śpiączki. Objawy mogą obejmować utratę przytomności, zaburzenia pamięci, ból głowy, nudności, wymioty, zawroty głowy, zaburzenia równowagi, a także zmiany w zachowaniu i nastroju.
Cel. Celem pracy była analiza wpływu zmiennych na występowanie zaburzeń przytomności u pacjentów po urazach czaszkowo-mózgowych w poszczególnych dobach hospitalizacji.
Materiał i metody. Badania przeprowadzono na grupie 100 pacjentów, hospitalizowanych na oddziale neurotraumatologii. W prospektywnych badaniach posłużono się metodą sondażu diagnostycznego z wykorzystaniem techniki pomiaru oraz ankiety. Do oceny stanu zaburzeń przytomności posłużono się skalą Glasgow (Glasgow Coma Scale). Otrzymane wyniki poddano analizie statystycznej, przyjmując za statystycznie istotną wartość poziom p<0,05. Na przeprowadzenie badań uzyskano zgodę Komisji Etycznej.
Wyniki. Analiza badań własnych wykazała, że nie ma statystycznie istotnych różnic w średnich wynikach stanu przytomności (GCS) między kobietami a mężczyznami w dniu przyjęciu do szpitala (Z=0,163; p=0,163) w 3 dniu hospitalizacji (Z=0,811; p=0,370) w 7 dniu hospitalizacji (Z=0,00; p=0,986) oraz w dniu wypisu (Z=0,011; p=0,917). Stwierdzono, że wiek pacjentów wykazuje ujemną korelację z wynikami skali GCS we wszystkich badanych dobach hospitalizacji. Korelacja ta jest statystycznie istotna (p<0,05) w przypadku wszystkich pomiarów poza przyjęciem do szpitala (p>0,05). Stwierdzono istotną statystycznie różnicę w średnich wynikach stanu przytomności (GCS) w zależności od przyczyny urazu w 3 dniu hospitalizacji (H=3,207; p=0,016) oraz w 7 dniu hospitalizacji (H=3,390; p=0,012). Nie stwierdzono istotnych różnic w dniu przyjęcia (p=0,200) i w dniu wypisu (p=0,076). Istnieją statystycznie istotne różnice w ocenie stanu przytomności (GCS) między grupą pacjentów z obecnością chorób współistniejących a grupą bez chorób współistniejących w dniu przyjęcia do szpitala (p=0,002) w 3 dniu pobytu w szpitalu (p=0,029) oraz w 7 dniu hospitalizacji (p=0,035). Natomiast różnice nie są istotne statystycznie w dniu wypisu ze szpitala (p=0,095).
Wnioski. Występujące zaburzenia przytomności u pacjentów po urazach czaszkowo-mózgowych w poszczególnych dobach hospitalizacji istotnie ewoluują od ciężkich zaburzeń (na początku hospitalizacji) do lekkich lub ich braku w dniu wypisu z oddziału. Czynnikami mającymi największy wpływ na zmianę stopnia zaburzeń przytomności w poszczególnych dobach hospitalizacji okazały się wiek chorego i występowanie chorób współistniejących. **(PNN 2025;14(2):68–75)**
Słowa kluczowe: urazy czaszkowo-mózgowe, zaburzenia przytomności, skala Glasgow

Introduction

Brain injury is a consequence of subjecting the skull to a force of mechanical energy that exceeds the adaptive capacity of the skull and meninges, where damage to the structures of the central nervous system results from the rapid impact of external forces. Brain dysfunction can be caused by diffuse changes or focal damage, with both disorders possibly occurring simultaneously. This results in altered Central Nervous System (CNS) functioning resulting from disturbances at the chemical and electrical levels of nerve cells [1].

The occurrence of craniocerebral injuries has been intensified in recent decades by the development of technology and the automotive industry, which is associated with an increase in road accidents, which, according to statistics, are the most common cause of these injuries. According to statistical studies, in highly developed countries, including Poland, craniocerebral injuries are considered the third leading cause of death and permanent disability among people aged 25 to 45. In subsequent positions, work-related accidents and falls from heights are proportionally ranked. Furthermore, ethanol is considered an extremely significant risk factor that increases the risk of craniocerebral injuries. It is estimated that a significant percentage of patients who suffered head injuries were under the influence of ethanol [1,2].

It is believed that the direct cause of craniocerebral injuries is sudden deceleration or acceleration. Available sources and research have demonstrated that during a crash, when the head strikes an obstacle, high positive pressure is generated inside the skull, while negative pressure is created on the side opposite the injury, which, through cavitation, leads to the rupture of brain tissue and blood vessels. This injury is called a contre-coup, while an injury located just below the point of impact is called a coup [1,3].

During an injury, brain tissue becomes contused. The brain's rapid displacement relative to the skull is

accompanied by so-called linear or rotational movement. The brain impacts the bumps and bulges within the surrounding bony capsule, most often causing contusion of the frontal poles of the brain [1,3].

A patient who has suffered a craniocerebral injury undergoes a thorough analysis of their condition. In clinical practice, several diagnostic methods can be distinguished, indicating the severity of brain lesions. These indicators are used to categorize the damage sustained by the injured patient's brain as a result of the injury. These include:

- the depth of coma in which the patient is, which is assessed using the GCS (Glasgow Coma Scale) scale,
- duration of the patient's loss of consciousness, with a score below 9 points on the GCS scale,
- the duration of PTA (post-traumatic amnesia), also known as anterograde amnesia, is the so-called period of time during which memory disorders occur in the patient from the moment of Traumatic Brain Injury (TBI) until the time of regaining continuous memory of everyday events,
- the occurrence of neurological symptoms and, consequently, confirmation of their cause by subjecting the patient to imaging diagnostic methods [1,4,5].

As a result of craniocerebral injuries, patients may experience a range of disorders. The effects of brain damage can have severe consequences, sometimes leading to permanent physical disability and irreversible behavioral and cognitive disorders, broadly defined as the consequences of craniocerebral injuries. The brain demonstrates the ability to regenerate, but the degree of repair depends on the severity of the injuries [1,3, 6–8].

Disorders of consciousness are conditions in which a person's contact with the external environment (i.e., the surroundings) is gradually reduced. In this situation, the body becomes unresponsive to external stimuli. Disorders of consciousness in TBI can take various forms, from mild concussion with brief loss of consciousness to severe brain damage leading to coma. Symptoms may include loss of consciousness, memory impairment, headache, nausea, vomiting, dizziness, balance problems, as well as changes in behavior and mood [1–4].

Studies examining disturbances of consciousness in patients with TBI during individual days of hospitalization allow for the observation of changes in the state of consciousness over time after the injury. Analyzing these changes over time, in conjunction with other clinical and radiological parameters, can provide valuable information about prognosis and the effectiveness of therapeutic interventions [1–4].

The aim of this study was to analyze the influence of variables on the occurrence of disturbances of consciousness in patients with TBI during individual days of hospitalization. Selected variables, such as gender, age, cause of injury, and comorbidities, were verified and their influence on the occurrence of disturbances of consciousness was determined.

Material and Methods

Study Design

The study was conducted among 100 patients hospitalized in the neurotraumatology department. The inclusion criteria were: a diagnosis of craniocerebral trauma by a neurology/neurosurgery specialist and a resulting hospitalization in the department for more than seven days.

Methods

In the prospective studies, a diagnostic survey method was used, using measurement and questionnaire techniques. The standard GCS was used to assess the level of impaired consciousness. This tool is the most widely used scale to assess the severity of impaired consciousness, a clinical feature of acute brain injury. The scale was designed to be easy to use in clinical practice in general and specialist wards. It is currently used by emergency medical services (EMS) teams, nurses, and physicians to assess all patients [9–11]. Three variables are assessed: I. Eye Opening (4 points — eyes open spontaneously, 3 — eyes opening to sound, 2 — eyes opening to pain, 1 — no eye opening); II. Verbal Response (5 points — Orientated, 4 — Confused, 3 — Inappropriate words, 3 — Incomprehensible sounds, 1 — No verbal response); III. Motor Response (6 points — Obeys commands, 5 — Localizing pain, 4 — Withdrawal from pain, 3 — Abnormal flexion to pain, 2 — Abnormal extension with pain, 1 — No motor response). The total score ranges from 3 to 15 points. For the purposes of these analyses, the following interpretation was adopted [12,13]: mild traumatic brain injury (mTBI), often referred to as a concussion (15–13 GCS points), moderate traumatic brain injury (12–9), unconsciousness (8–6), decortication (5), decerebration (4), cerebral death (3).

The study also utilized a survey questionnaire containing questions regarding the patient's sociodemographic and clinical data. Other data necessary to verify the hypotheses were obtained from medical records.

Material

The study included a group of 100 patients hospitalized for craniocerebral trauma. The inclusion criteria were: a craniocerebral trauma diagnosed by a neurology/neurosurgery specialist and a resulting hospitalization in a hospital ward exceeding 7 days. Exclusion criteria included a diagnosis of craniocerebral trauma not confirmed by a specialist, the length of stay in the hospital less than 7 days, and the patient being under the age of 18. Sociodemographic and clinical characteristics are presented in Table 1.

Table 1. Sociodemographic and clinical characteristics of the respondents

Variable	N	%
Gender		
Woman	36	36.0
Man	64	64.0
Age (Mean 56.24, SD 19.35)		
Type of craniocerebral injury*		
Abrasions, contusions, skin tears, subcutaneous hematomas	48	48.0
Skull fractures/cracks	34	34.0
Concussion	30	30.0
Brain contusion	54	54.0
Diffuse axonal injury	33	33.0
Intracranial hematomas	41	41.0
Cause/location of craniocerebral trauma		
School/workplace	15	15.0
Home	18	18.0
Accidents	18	18.0
Traffic accidents	35	35.0
Medical complications	12	12.0
Other	2	2.0
Comorbidities*		
Yes	17	17.0
No	83	83.0
Insulin-dependent diabetes mellitus	38	38.0
Asthma	10	10.0
Arterial hypertension	38	38.0
Chronic obstructive pulmonary disease (COPD)	10	10.0
Hyperthyroidism	13	13.0
Hypothyroidism	16	16.0
Rheumatoid arthritis	15	15.0
Ischemic heart disease	20	20.0
Neurological disorders	29	29.0

*multiple diagnoses/diseases; N — number of observations; % — percent

Ethical Considerations

The study was approved by the Bioethics Committee. The study was conducted in accordance with ethical principles and the requirements of the Declaration of Helsinki.

Data Analysis

The results were processed using Microsoft Excel and SPSS Statistica 25.0. Quantitative statistics and statistical descriptive methods were used in the statistical analysis: the arithmetic mean (M) as a measure of location, the standard deviation (SD) as a measure of diversity, and the standard error. Correlation tests (Pearson's correlation coefficient) and the significance of mean difference tests (Kruskall–Wallis test, Mann–Whitney U test) were used. A probability value of $p<0.05$ was considered statistically significant.

Results

Analysis of the State of Consciousness on Individual Days of Hospitalization

The analysis of the conducted studies (Table 2) shows that immediately after admission, 50% of the patients studied exhibited moderate traumatic brain injury, 23% — unconsciousness, 18% — mTBI, 6% — decortication, 2% — decerebration, and 1% — cerebral death. On the third day of hospitalization, the majority of the patients — 56% — exhibited moderate traumatic brain injury, 17% — unconsciousness, 19% — mTBI, 4% — decortication, 1% — decerebration, and 3% — cerebral death. On the 7th day of hospitalization, 32% of patients demonstrated moderate traumatic brain injury, 18% — unconsciousness, 40% — mTBI, 1% — decortication, 1% — decerebration, and 8% — cerebral death. On the day of discharge, 73% demonstrated mTBI, 13% demonstrated moderate traumatic brain injury, and 11% demonstrated cerebral death. 2% of patients demonstrated unconsciousness, while 1% demonstrated decerebration.

Gender and Disorders of Consciousness on Individual Days of Hospitalization

The conducted studies indicate that the differences in the mean scores of the state of consciousness (GCS) between women and men are not statistically significant at any of the examined time points (days of hospitalization). Based on the statistical analysis (Mann–Whitney test), it can be concluded that there are no statistically

Table 2. State of consciousness on individual days of hospitalization

GCS	Admission		3 day		7 day		Discharge	
	N	%	N	%	N	%	N	%
Unconsciousness	23	22.8	17	16.8	18	17.8	2	2
mTBI	18	17.8	19	18.8	40	39.6	73	72.3
Decortication	6	5.9	4	4	1	1	0	0
Decerebration	2	2	1	1	1	1	1	1
Cerebral death	1	1	3	3	8	7.9	11	10.9
Moderate traumatic brain injury	50	49.5	56	55.4	32	31.7	13	12.9
Total	100	100	100	100	100	100	100	100

N — number of observations; % — percent

Table 3. Gender and disorders of consciousness on individual days of hospitalization

Gender		GCS on the day of admission to the ward	GCS on the 3rd day of hospitalization	GCS on the 7th day of hospitalization	GCS on the day of discharge from the hospital
Women	$\bar{x}$	9.4844	9.8906	10.7344	12.4063
	N	64	64	64	64
	SD	2.90589	3.23236	3.97709	4.39956
Men	$\bar{x}$	10.3056	10.4722	10.7500	12.3056
	N	36	36	36	36
	SD	2.61664	2.84340	4.37117	4.94437
Total	$\bar{x}$	9.7800	10.1000	10.7400	12.3700
	N	100	100	100	100
	SD	2.81977	3.09610	4.10129	4.57851
Z		0.163	0.811	0.000	0.011
p		0.163	0.370	0.986	0.917

$\bar{x}$ — mean; N — number of observations; SD — standard deviation; Z — Mann–Whitney U test; p — level of statistical significance

significant differences in the mean scores of the state of consciousness (GCS) between women and men on the day of admission to the hospital (Z=0.163; p=0.163), on the 3rd day of hospitalization (Z=0.811; p=0.370), on the 7th day of hospitalization (Z=0.00; p=0.986) and on the day of discharge (Z=0.011; p=0.917) (Table 3).

Age and Disorders of Consciousness on Individual Days of Hospitalization

Patient age shows a negative correlation with GCS scores across all hospitalization days, meaning that the older the patient, the lower the mean GCS score. The correlation is statistically significant ($p<0.05$) for all measurements except hospital admission ($p>0.05$). On the day of hospital admission: the correlation is not statistically significant (p=0.073); on the 3rd day of hospital stay: the correlation is significant (p=0.006); on the 7th day of hospitalization: the correlation is significant (p=0.002); and on the day of hospital discharge: the correlation is very strongly significant (p=0.000) (Table 4).

Cause/Location of Injury and Disorders of Consciousness on Individual Days of Hospitalization

Based on the statistical analysis (Kruskall–Wallis test), it can be concluded that there is a statistically significant difference in the mean scores for the level of consciousness (GCS) depending on the cause of injury on the 3rd day of hospitalization (H=3.207; p=0.016) and on the 7th day of hospitalization (H=3.390; p=0.012). No significant differences were found on the day of admission (p=0.200) and on the day of discharge (p=0.076) (Table 5).

Table 4. Age and disorders of consciousness on individual days of hospitalization

Age	GCS on the day of admission to the ward	GCS on the 3rd day of hospitalization	GCS on the 7th day of hospitalization	GCS on the day of discharge from the hospital
Pearson correlation	–0.180	–0.272	–0.306	–0.395
p	0.073	0.006	0.002	0.000
N	100	100	100	100

p — level of statistical significance; N — number of observations

Table 5. Cause/location of injury and disorders of consciousness on individual days of hospitalization

Cause of craniocerebral trauma		GCS on the day of admission to the ward	GCS on the 3rd day of hospitalization	GCS on the 7th day of hospitalization	GCS on the day of discharge from the hospital
School/workplace	$\bar{x}$	10.0588	10.6471	12.6471	13.9412
	N	17	17	17	17
	SD	2.35772	2.39638	1.90201	1.19742
Home	$\bar{x}$	9.0500	8.9000	8.5000	10.3000
	N	20	20	20	20
	SD	2.83725	3.95900	5.58664	6.25005
Accidents	$\bar{x}$	10.2273	10.4545	10.4545	12.1818
	N	22	22	22	22
	SD	2.58073	2.66775	3.83874	5.31517
Traffic accidents	$\bar{x}$	10.1765	10.8824	11.6176	13.2647
	N	34	34	34	34
	SD	3.13795	2.86848	3.67642	3.36928
Medical complications	$\bar{x}$	7.8571	7.2857	9.1429	10.7143
	N	7	7	7	7
	SD	2.34013	2.05866	2.91139	5.28250
Total	$\bar{x}$	9.7800	10.1000	10.7400	12.3700
	N	100	100	100	100
	SD	2.81977	3.09610	4.10129	4.57851
H		0.200	3.207	3.390	2.185
p		0.200	0.016	0.012	0.076

$\bar{x}$ — mean; N — number of observations; SD — standard deviation; H — Kruskal–Wallis test; p — level of statistical significance

Table 6. Comorbidities and disorders of consciousness during individual days of hospitalization

Comorbidities		GCS on the day of admission to the ward	GCS on the 3rd day of hospitalization	GCS on the 7th day of hospitalization	GCS on the day of discharge from the hospital
No	$\bar{x}$	11.6471	11.5882	12.6471	14.0588
	N	17	17	17	17
	SD	1.65609	1.58346	2.91421	3.63095
Yes	$\bar{x}$	9.3976	9.7952	10.3494	12.0241
	N	83	83	83	83
	SD	2.86246	3.24511	4.21216	4.69295
Total	$\bar{x}$	9.7800	10.1000	10.7400	12.3700
	N	100	100	100	100
	SD	2.81977	3.09610	4.10129	4.57851
Z		0.002	4.920	4.589	2.838
p		0.002	0.029	0.035	0.095

$\bar{x}$ — mean; N — number of observations; SD — standard deviation; Z — Mann–Whitney U test; p — level of statistical significance

Comorbidities and Disorders of Consciousness during Individual Days of Hospitalization

The results of Mann–Whitney tests show that there are statistically significant differences in the assessment of the state of consciousness (GCS) between the group of patients with comorbidities and the group without comorbidities on the day of hospital admission (p=0.002), on the 3rd day of hospital stay (p=0.029), and on the 7th day of hospitalization (p=0.035). However, the differences are not statistically significant on the day of hospital discharge (p=0.095) (Table 6).

Discussion

The study aimed to analyze the influence of variables on the occurrence of disorders of consciousness in patients with traumatic brain injury during individual days of hospitalization. Selected variables, such as gender, age, cause of injury, and comorbidities, were verified and their impact on the occurrence of disorders of consciousness was determined.

In our own research, a larger group of patients after craniocerebral injuries were men (64% of the studied population), while the percentage of women was only 36%. Similar gender proportions were presented in the study by Kaźmierczak et al. [14], where the majority of patients were male.

In our own research, the youngest person to suffer an injury was 19 years old, while the oldest was 96. The average age of the participants was just over 56 years.

The results indicate that the most common cause/site of craniocerebral injury were road traffic accidents (35% of the study participants), followed by accidental accidents and home accidents (18% each). The fewest, only 2% of the study participants, suffered craniocerebral injury due to another cause. In Szewczak's study [15], the most common cause of craniocerebral injury was assault, while in Rutkowska's study [16], the majority of patients suffered injuries as a result of falls, with the second group of patients after road traffic accidents.

The most frequently diagnosed type of craniocerebral injury among the study participants was brain contusion (54% of the study participants). This was followed by abrasions, contusions, skin tears, subcutaneous hematomas (48% of the study participants), and intracranial hematomas (41% of the study participants). In the study conducted by Ciechanowicz et al. [17], the most common types of injury were skull fracture and cerebral edema.

Our own research has shown that as many as 83% of the respondents are treated for at least one comorbidity, while 17% of the respondents do not have it at all.

Assessment of the patients' state of consciousness using the GCS scale revealed that at the time of admission, half of the patients (50%) had moderate traumatic brain injury, 23% had unconsciousness, 18% had mTBI, and 1% had a cerebral death. The patients' state of consciousness on the third day of hospitalization changed as follows: 56% had moderate traumatic brain injury, 19% had mTBI, 17% had unconsciousness, 4% had decortication, 3% had cerebral death, and 1% had decerebration. On the seventh day of hospitalization, 40% had mTBI, 32% had moderate traumatic brain injury, 18% had unconsciousness, 8% had cerebral death, and 2% had decortication and decerebration. On the day of discharge, the patients' state of consciousness improved significantly. Mild disturbances were observed in 73% of the examined patients, while unconsciousness was observed in only 2% of the examined patients.

Analyzing the differences in the mean results of the state of consciousness (GCS) between women and men, it was found that they were not statistically significant ($p>0.05$) at any of the examined time points (days of hospitalization).

The study found that patient age is a significant ($p<0.05$) factor correlating with the level of consciousness assessed on the GCS scale at various times during hospitalization. This means that the older the patient, the lower the mean GCS score. These results suggest that age should be taken into account when assessing patients' condition and planning their care and rehabilitation in the context of craniocerebral injuries.

Our own research on the level of consciousness of patients depending on the cause of craniocerebral injury indicates that on the day of hospital admission and on the day of discharge, there are no statistically significant differences ($p>0.05$) in the level of consciousness of patients depending on the cause of injury. Statistically significant differences ($p<0.05$) were noted on days 3 and 7 of the patient's hospital stay.

Based on the statistical analysis, it can be concluded that the presence of comorbidities has a significant ($p<0.05$) impact on the assessment of the state of consciousness of patients with craniocerebral trauma during individual days of hospitalization, with the exception of the assessment on the day of discharge from the hospital ($p>0.05$). Patients with comorbidities more often show lower GCS results, which may result in poorer functioning of the nervous system and the entire body. The research by Baczuk [18] confirms that the presence of comorbidities has a significant impact on the treatment process.

Conclusions

The disorders of consciousness occurring in patients after craniocerebral injuries during the individual days of hospitalization significantly evolve from severe

disturbances (at the beginning of hospitalization) to mild or no disturbances on the day of discharge from the ward.

The factors with the greatest influence on the change in the degree of consciousness disorders during individual days of hospitalization were the patient's age and the presence of comorbidities.

Implications for Nursing Practice

The clinical condition of patients after craniocerebral injury depends on many aspects, such as the degree of injury, location of the injury, age of the patient, and the health condition of the patient before the injury [19]. Our own studies have shown that disorders of consciousness in patients after craniocerebral injury change during the individual days of hospitalization, which undoubtedly affects the type and time of individual nursing and clinical interventions.

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