

# Language Disturbances Motorcyclists with Head Trauma

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## **ABSTRACT**

This is a quantitative, descriptive, cross-sectional study whose target was to determine the language alterations in motorcyclists with traumatic brain injury, in Sincelejo (Colombia). The population was found in 62 school-aged motorcyclist patients between 15 and 60 years. They were diagnosed by the neurosurgery service with an alert consciousness state through the Glasgow Scale in a Trauma Clinic. They also were in a pre-discharge medical condition, to whom the Boston Test for the Diagnosis of Abbreviated Aphasia was applied. The data obtained were tabulated with the Statistical Package Epi Info 7.1.5.2. The results indicated that 21% of the population presented comprehensive language alteration in moderate craniocerebral traumas with injury to the temporal lobe, 13% an expressive language alteration in moderate and severe traumas with injury to the frontal lobe, 3% a mixed language alteration in severe traumas with affectation in the front-temporal-occipital-parietal lobes, and 63% showed normality in the expressive and comprehensive linguistic parameters in mild craniocerebral traumas that presented a Computerized Axial Tomography without specification of affection in the cerebral cortex. However, some in the use of language in conversational skills were observed some difficulties, as well in the non-verbal aspects of communication. It is concluded that head injuries generated language alterations in the comprehensive, expressive, and mixed components, and in the use of language.

**Keywords:** Craniocerebral Trauma, Language Disorders, Motorcycles, Accidents, Traffic.

## **1. INTRODUCTION**

Motorcycle traffic accidents are one of the head trauma main causes. Due to the different injuries, it causes, accidents become a global Public Health problem, which delimits a simple partial or permanent disability in the driver or passenger. The high global statistics of accidents are due to non-compliance with traffic regulations such as speeding under alcohol or drugs influence, non-use and helmet quality lack, and the vehicle's poor mechanical technical condition.

The World Health Organization-WHO (2021) road safety sixth-week report described that traffic accidents cause 1.3 million deaths and some 50 million injuries per year. The potentiation trend for the next decade of deaths and injuries increases especially in low- and middle-income countries. The Pan American Health Organization-PAHO (2019) report that the road safety situation in the Americas published those injuries caused by traffic constitute the second leading cause of morbidity in young adults between 15 and 29 years of age, attributed to the most vulnerable users: motorcyclists (23%), pedestrians (22%) and cyclists (3%) in middle-income countries.

In Colombia, according to the accident balance of the National Road Safety Observatory (2021), a total of 7,270 people died, 4,312 were motorcyclists, 1,566 were pedestrians, 852 vehicle users, and 471 bicycle users, and 615 of them died from a cause associated with a motorcyclist for speeding, disrespecting traffic signs and driving under the influence of alcohol with a greater occurrence in the Caribbean region cities.

The statistical deaths and injuries bulletin as indicated by the National Road Safety Agency - ANSV (2021) notes that a total of 124 people died. This is a significant increase compared to the deaths average in previous years in the Sucre department. Likewise, the Traffic and Transportation National Police Section of Sucre (2021) confirmed that the road actors that contribute the highest number of deaths and injuries in the department are male motorcyclists with 44.6%, due to non-use of the regulatory protection helmet, with a higher accident rate of 30.2% (42) Sincelejo city. This is how the Admissions Coordination of a private clinic (2019) reported an entrance in the quarterly period of 1,570 people to the emergency room, 1,315 were diagnosed with traumatic brain injury; a significant figure that indicates disabled subjects' high percentage, which confirms that Sincelejo and its surrounding areas do not escape the global reality indicated in current epidemiological studies.

There are language alterations among the possible cognitive difficulties generated by craniocerebral traumas. The neuropsychological point of view affirms that this is caused by a lesion in the cerebral cortex in Broca's and/or Wernicke's area. When it is injured, could externalize an expressive and/or comprehensive linguistic sign.

In this way, Azouvi et al & Ríos et al (as cited in Vales, 2019) suggest that language disorders are very disabling, although only 15% of patients with ECT present pure aphasic syndromes. Regarding comprehension disturbances, these are observed less frequently and are milder. While alterations in the language expression are seen more frequently, showing decreased verbal fluency, increased circumlocutions and paraphrases, and the perseverations appearance. Along the same lines, Muñoz & Melle (as cited in Vales, 2019) indicate other communicative difficulties that have to do with being able to interpret ambiguous sentences, grasp the irony or maintain the discourse logical structure itself, prosody, and the pragmatic

competence. Due to the above, the research group set itself the objective of determining the language alterations in motorcyclists with traumatic brain injury, considering the motorcycle accidents high statistic that occurs in Sincelejo.

However, considering the research purpose and study variables, there are quantitative-descriptive-correlational non-experimental investigations that summarize the current studies related to the subject. At an international level, in Australia, Barwood & Murdoch (2013) investigated with the purpose of determining the mild traumatic brain injury on linguistic cognitive processing influence of selecting 16 patients with mild traumatic brain injury and 16 control participants. The results obtained through the Comprehensive Test Battery for Aphasia applied 18 months after the trauma, indicated statistically significant differences between the group with trauma and normal performance in the high-level language tests, linguistic concepts test, and semantic memory test.

In the control group, in tasks that required complex lexical-semantic operations and that demanded the memory usage to remember, organize, infer, name, associate, build sentences, generate synonyms, understand ambiguous phrases and verb tenses. Likewise, reduced performance in writing tasks was demonstrated and the mild post-traumatic brain injury generates deficiencies in the linguistic cognitive behavior of the patients.

In Argentina, Longoni & Peralta (2011), developed a non-experimental correlational descriptive quantitative study, with the purpose of describing the patient's neurocognitive disorders with severe traumatic brain injury and their results at the discharge time. They applied the Nomination of Boston, Verbal Fluency Subtest vocabulary from the Wechsler Scale of Intelligence to 28 patients. The findings showed that language was affected in 66% of patients with primary education and 60% secondary, with a result the high affectation involvement in 16% and 10% for primary and secondary education, concluding that after traumatic brain injury, language can be disorganized and with pragmatic difficulties, with anomie being the most frequent linguistic deficit and lack of verbal fluency.

Likewise, at the national level Cali, Quijano, Arango, Cuervo & Aponte (2012), developed a study to compare a control group and patients with traumatic brain injury to determine the neuropsychological differences existing at six months of evolution and thus guide intervention programs in accordance with the population needs. A total of 79 patients with a cranioencephalic trauma history with six months minimum of evolution and 79 subjects in the control group were evaluated. The results showed significant differences in orientation, attention, memory, language, reading, and writing tasks, indicating that head trauma leaves significant neuropsychological sequelae, even six months after the traumatic event.

In Medellín, Pérez (2011), carried out a non-experimental-observational investigation, in which the emotional, behavioral, and cognitive alterations presented by patients with

moderate and severe head trauma are analyzed during the acute period following the event. The study was performed on 16 patients who had been admitted to the emergency room or outpatient clinic in selected hospitals. The linguistic component was evaluated 6 times for 3 months, through the Bedside language test and the abbreviated Boston Denomination test, the results showed lower scores in the evaluated areas, which indicates that patients with traumatic brain injury can reach faster recovery responses to stimuli but take longer to recover other functions such as language, orientation, memory, attention, behavior, and functionality.

It is important to highlight that, for Sincelejo-Sucre (Colombia), to date, in a cybergraphic search, no investigative disclosures were found that indicate the linguistic implications generated by a traumatic brain injury resulting from a traffic accident. Currently, two investigations related to the motorcyclist population subject to study are known; but they refer to musculoskeletal disorders by Aldana (2013) and to a socio-economic analysis by Sánchez (2011). From this perspective, this study is relevant, since the University of Sucre becomes the first Higher Education Institution that leads investigative processes under this theme, inciting in the student population and professionals in speech therapy the investigative interest in the line of language disorders in adults.

## **2. MATERIALS AND METHODS**

The research was developed under a quantitative approach, descriptive study type, and cross-sectional design. The 62 patients selected through an intentional non-probabilistic sampling for convenience, met the inclusion criteria. Those patients with motorcycle head trauma accident diagnosed by neurosurgery with imaging tests with local or diffuse injury, hospitalized, in an alert state of consciousness determined by neurosurgical assessment through the Glasgow scale and in pre-discharge condition, aged between 15 and 60 years old and schooled with minimum level primary basic education, who did not present visual, auditory or medical relevance motor difficulties that interfere with the test and associated premorbid conditions performance, treated in the period from April and August 2019 in a private clinic from Sincelejo city.

First, For the collection of information, the informed consent was signed by the family member, to explain the research process, rights, and duties of the subject under study, according to the criteria proposed by the Declaration of Helsinki (2013). Subsequently, the Boston Test Anamnesis Form for the Diagnosis of Goodglass Aphasia (2005) was applied. This allowed the collection of information on the population in socio-demographic and clinical premorbid linguistic aptitudes terms, current communicative capacity, background clinical, neurological diagnosis, lesion, and location, and finally, the Boston Test for the Diagnosis of Aphasia Goodglass (2005) abbreviated version was applied to determine the patient's language alterations under study. The statistical package Epi Info 7.1.5.2 was used

for the data tabulation. Each variable measurement was obtained in tables of frequencies and percentages.

### 3. RESULTS

It is observed that 48% of the patients are between the age ranges of 15-25 years, 39% in young adulthood between 26-40 years, and 13% adults with ages between 41-60 years; 73% belonged to the male gender and 27% to the female gender; 65% were employed and/or self-employed; 19% unemployed and 16% students; 58% attended secondary school, 18% primary, 13% technical and 11% professional; 81% are located in a low socioeconomic stratum and 19% in a medium level; 76% did not use a case during the accident and 24% said they were wearing it at the event, and 65% drove the motorcycle and 35% were mobilized as passengers in the traffic accident. (See Table 1)

**Table 1. Sociodemographic distribution data in the total sample**

Sociodemographic aspects	Frecuency (n=62)	Percentage (100%)
<b>AGE</b>		
Young	30	48
Young adult	24	39
Adult	8	13
<b>GENDER</b>		
Masculine	45	73
Femenine	17	27
<b>OCCUPATION</b>		
Employed / Self -employed	40	65
Unemployed	12	19
Student	10	16
<b>SCHOLARSHIP</b>		
Primary	11	18
Secondary	36	58
Technical	8	13
Professional	7	11
<b>SOCIOECONOMIC LEVEL</b>		
Low	50	81
Medium	12	19
High	0	0
<b>HAMLET USE</b>		
No	47	76

Yes	15	24
<b>MOTORCYCLIST</b>		
Driver	40	65
Passanger	22	35

Regarding the population with trauma clinical characteristics, 38% presented a Computerized Axial Tomography without specifying involvement in the cerebral cortex, 24% involvement in the right hemisphere and 24% in the left hemisphere, and 13% in the left hemisphere bilateral cerebral cortex; 33% a diagnosis of unspecified head trauma, 19% injury to the temporal lobe, another 19% to the front-temporal-parietal-occipital lobes, 16% to the frontal lobe, 10% to the parietal lobe, and 3% in the occipital lobe; 66% mild trauma according to the Glasgow Scale, 27% moderate and 6% severe; 68% did not show acoustic signs and symptoms after the traffic accident, 18% otorrhea, 6% labyrinthine syndrome, 5% hearing loss, and 3% otalgia. (See Table 2).

**Table 2. Distribution of clinical aspects in the total sample**

Clinical aspects	Frecuency (n=62)	Percentage (100%)
<b>AFFECTED HEMISPHERE</b>		
Bilateral	8	13
Straight	15	24
Left	15	24
Not specified	24	39
<b>PLACE OF INJURY</b>		
Frontal	10	16
Tempory	12	19
Occipital	2	3
Parietal	6	10
Fronto- Parieto-temporo-occipital	12	19
Not specified	20	33
<b>TYPE OF INJURY</b>		
Mild TBI	41	66
Moderate TBI	17	27
Severe TBI	4	7
<b>ACOUSTIC SIGNS AND SYMPTOMS</b>		
Does not report	42	68
Hearing loss	3	5
Otalgia	2	3

Otorrhea	11	18
Syndrome Labyrinthine	4	6

Whit the review of the general average performance obtained in the expression tasks, it was identified that 80% showed a high-superior performance, 11% medium-high, 7% poor, and 2% medium. Likewise, it was found that 15% presented errors in their spontaneous speech. It was highlighted that, in mild trauma, 2% presented agrammatism; in moderate trauma, 12% phonemic paraphasias and perseverations and to a lesser extent, 6% coprolalia and logorrhea; and in severe trauma, 50% mutism and 25% agrammatism and phonemic or literal paraphasias. (See Table 3)

**Table 3. Distribution of the average general performance in expression tasks**

EXPRESSION RESULTS	FRECUENCY	PERCENTAGE
High-Superior Performance	50	80%
Medium High Performance	7	11%
Medium Performance	1	2%
Poor Performace	4	7%
Total	62	100%

In the average general performance distribution in the listening comprehension test was found that 38% showed a medium-high performance, 26% high, and another 26% superior. However, 8% exhibited low to poor performance and 2% medium. When analyzing the comprehensive linguistic errors observed in the patients according to the severity of the trauma; it was determined that in mild trauma, 5% presented anomie and semantic paraphasias, 7% unrelated paraphasias, and 2% circumlocution; in moderate trauma, 24% semantic paraphasias and neologisms, 18% circumlocutions, 12% anomies and 6% paragrammatism; and in severe trauma, 50% semantic paraphasias, neologisms, circumlocutions, and anomies; and 25% related paraphasias. (See Table 4).

**Table 4. Distribution of the average general performance in auditive comprehension**

PERFORMANCE	FRECUENCY	PERCENTAGE
<b>Superior Performance</b>	16	26%
<b>High performance</b>	16	26%
<b>Medium – high yield</b>	24	38%
<b>Médium yield</b>	1	2%

<b>Poor performance -low</b>	5	8%
<b>Total</b>	62	100%

Regarding the language alterations behavior found in the studied population, it was found that 21% presented a Comprehensive language alteration determined by a severity scale that establishes communication in which the patient can. With the examiner's help, it maintains a familiar conversation topic, but failures occur when the person attempts to express an idea. Due to reduced comprehension, low-poor performance in listening comprehension tasks of the word, discrimination, commands, and complex ideational material defined by semantic-type paraphasias and /or unrelated; neologisms, circumlocutions, and anomies in the objects denomination and by semantic category; and fluency in speech without content characterized by paragrammatisms. Comprehensive language alterations were shown with a higher incidence in moderate head traumas with lesions at the level of the temporal lobe.

An Expressive language alteration was observed with a 13%, characterized by a severity scale that identifies a communication that is made from incomplete expressions with a great need for inferences, questions, and guessing by the listener that limits information falling back exchange. In conversation weight about the interlocutor; low-deficient performance in expressive linguistic tasks with articulatory agility with clumsiness at the phonetic and syllabic level that evidenced the literal paraphasias presence in a sentence length with occasional emissions of 1 to 4 words without syntactic groupings and/or incomplete simplified forms with grammatical morphemes omissions that determined the presence of syntactic agrammatisms, a melodic line defined by the emission of the word for words and/or sentences limited intonation to short phrases that identified an a prosodic speech, a repetition, recitation and imperfect naming that showed perseverations, phonemic paraphasias and in severe cases mutism. Expressive language disturbances were frequently evidenced in moderate and severe head injuries with lesions in the Frontal lobe.

The 3% of the population studied presented a mixed language alteration established by the speech absence and auditory comprehension characterized by low performance in expression task and comprehension evidenced by mutism linguistic error. Mixed language disorders showed a higher incidence in severe cranioencephalic trauma with involvement of the frontal-temporal-occipital-parietal lobes.

The 63% showed normality in the linguistic parameters due to minimal perceptible deterioration in speech. The patient can express non-subjective difficulties for the evaluator established by high-superior performance in the expression and comprehension tests. However, it was observed that the patients presented difficulties in conversational and discursive skills, and in the non-verbal communication aspects. Likewise, a compromise was evidenced in the information speed processing, attention, verbal memory, and verbal auditory



retention. Likewise, symptoms of post-traumatic amnesia were identified due to the inability to remember information after the trauma and depression due to showing levels of anxiety. The normality in the expressive and comprehensive communicative processes was evidenced in the mild cranioencephalic traumas that presented a Computerized Axial Tomography without specification of affection in the cerebral cortex. (Table 5)

**Table 5. Distribution of language disorders, in the total sample**

LANGUAGE DISORDERS	FRENCUENCY	PERCENTAGE
Expressive language disturbance	8	13%
Comprehensive language impairment	13	21%
Mixed language disorder	2	3%
Linguistic normality parameters expressive and understanding	39	63%
Alterations in the use of language		
Total	62	100%

#### 4. DISCUSSION

In relation to the sociodemographic aspects, most of the patients evaluated belong to the male gender (73%), the "young" age group between 15 and 25 (48%) with employed/independent work dedication (65%), level secondary education (58%), low socioeconomic status (81%) that does not use protection measures (76%) and traveled as drivers of their own motorcycles (65%). These findings could be interpreted due to the fact that the motorcycle riders community in Sincelejo city correspond to the male gender in productive ages, dedicated to motorcycle taxis as an economic activity of "rebusque", within labor informality, added to the growing unemployment by the Few opportunities offered by the environment and their educational level, which causes a significant increase in accident levels due to not complying with traffic regulations and personal protection measures such as the use of helmets. Therefore, the results coincide with those proposed by Montalván (2013) in the clinical and epidemiological characterization of a population with traumatic brain injury, who states that male subjects are mostly exposed to traumatic brain injury, however, the average age. In this case, he is older (45.9 years).

However, the results in educational level terms and socioeconomic status agree with Pérez (2011) and Cabrera et al. (2009), when referring that many individuals with traumatic brain injury have secondary education (57%) and that cranial trauma has a higher incidence in populations with limited economic resources. However, Pérez (2011), when mentioning the studies on the head trauma epidemiology has shown heterogeneous results at the work level.

Regarding the clinical characteristics, and according to the scores established by the Glasgow scale it was evidenced that the patients evaluated presented a higher mild trauma prevalence (66%), with 61% and 39% unspecified hemisphere involvement and cerebral lobe respectively, diagnosed by computed axillary tomography throwing readings, without cerebral cortex conditions. These findings can be presented because most of the traumas evaluated present a mild commitment, to this Bascañana, Labi, Villarreal & Santana (2002), argue that mild cranioencephalic trauma neuropathological substrate is the diffuse axonal injury caused in the mass brain by shearing forces due to sudden deceleration. The gray matter-white matter junction area seems to be the most susceptible to injury. This type of trauma can be difficult to demonstrate with the usual computed tomography and electroencephalography tests, results that coincide with those reported by Bárcena et al. (2006), which indicates that mild trauma is frequent (72%), 16% moderate, and 12% severe.

Likewise, Jaramillo et al (2001), agree with the subject's high proportion of head trauma that did not present a defined location. However, in those specified, involvement of the frontal (16%) and temporal (19%) areas were found, which is like the findings of Pérez (2011) who maintains that, although this does not depend on the causal mechanism, it can be explained because the frontal lobe occupies almost half of the brain and is more exposed to injuries due to its location in the anterior part. Likewise, the temporal lobe is affected by the blow effect and countercoup, and by its location. Regarding the characteristic of the motorcyclist, the results are corroborated with those found by Jaramillo et al. (2001), in their study stating that the majority of the injured were motorcyclists 34% and most passengers, data that are consistent with the investigation results. Regarding post-trauma acoustic signs and symptoms, otorrhea was found in 18%, labyrinthine syndrome (6%), hearing loss (5%), and otalgia in 3%. These findings are interpreted considering what was stated by Bardley (2010) who states that fractures of the posterior area of the skull base can extend to the petrosal bone and the internal auditory canal, thus damaging the vestibulocochlear nerve and producing sensorineural hearing loss, labyrinthine syndrome, or other hearing conditions.

When analyzing the average general performance results of the population expressive language tasks, it was shown that the majority presented a high-superior performance, obtaining a percentage of 80% respectively. These findings can be justified by the spontaneous recovery that patients show when they are in a pre-discharge period. This is how the research results agree with Quijano et al. (2012) who report that, during the initial phase after the traumatic event, the patient appears confused and disoriented, but as days go by this condition tends to improve as part of the spontaneous recovery. Likewise, the authors maintain that the results will depend on multiple factors such as the injury type, the subject's age, and the trauma severity, among other aspects. Given the exposed argument, it is pointed out that much of the population evaluated in the study corresponded to cases of mild trauma, and that, in accordance with the literature, they show a rapid recovery that allows them to reintegrate into society and work life. However, when interpreting the patient's results in the

cases of Severe Trauma (7%), they presented a poor performance in the expression tasks concerning fluency, simple social responses, articulation, recitation, repetition, and naming. These findings coincide with the research carried out by Moran, Solovieva, Quintanar & Machinskaya (2013) in which the absence of language and the difficulty in producing grammatical sentences in a patient with severe trauma are revealed.

On the other hand, at the average interpretation, the comprehensive language level general results evidenced that 52% present conservation with high-superior performance. Those findings are due to the considerable number of patients with minor trauma, who showed a good performance having minor compromise injuries.

Alberdi, Iriarte, Mendía, Murgialdai & Marco (2009), in a review on the sequelae prognosis after brain injury, highlight that most patients with mild trauma recover with adequate information and without additional specific intervention. The spontaneous recovery theory argues for this result, considering that an important proportion of this phenomenon is the underlying neurophysiological processes effect that develop in the brain after some pathological condition. In the population assessed case, an early recovery was evidenced, which explains the rapid recovery observed, which is influenced by the decrease in cerebral edema and the possible hemorrhages disappearance, as stated by Ardila (2005). However, this conclusion differs from those established by Barwood & Murdoch (2013) who, when determining the mild trauma influence on linguistic cognitive processing, found statistically significant differences between 16 cases of mild TBI and 16 control group subjects, in tasks that demanded lexical-semantic operations and the use of memory.

The results of research concerning the language disorders identification in patients with cranioencephalic trauma, showed that 21% presented a comprehensive language disorder in moderate trauma with injury at the temporal lobe level, 13% a language disorder expressive in moderate and severe traumas with lesions at the frontal level, and 3% a mixed language alteration in severe traumas with affectation in the fronto-temporo-occipito-parietal lobes. These findings are justified considering what was stated by Boisson et al. (as cited in García et al., 2002) which refer that traffic accidents, which are surely the most common cause of head injuries, leave language and speech sequelae. In the case of the temporal lobe focal lesions, the Luria acoustic-agnostic and acoustic-amnesic sensory type symptoms are found, like Wernicke's aphasia and classic amnesic aphasia and even to conduction aphasia, which is what those They usually end up being in the sequel situation. Benson & Barraquer (as cited in García et al., 2002). Frontal, prefrontal lesions are usually accompanied by the dynamic frontal or transcortical motor aphasia model, or at least by an alteration in verbal fluency and appetite for language. Frequently, mixed pictures are evidenced when the language zone is involved in extensive traumatism of the left hemisphere, producing mixed aphasias with components of temporal, parietal, and frontal lesions.

In addition, 63% presented normality in the expressive and comprehensive linguistic parameters in mild traumas that presented a Computerized Axial Tomography without specification of affection in the cerebral cortex. However, at language use level, they manifested difficulties in conversational and discursive skills and in non-verbal aspects of communication. These results are related to what was stated by Muñoz & Melle (2004) who describe in their review article "Alterations in the pragmatics of communication after a traumatic brain injury" that alterations in pragmatic skills after a traumatic brain injury are identified by disorders in the norms of conversation, non-verbal aspects and communicative competence. Beukelman & Yorkston (as cited in Muñoz & Melles, 2004). In this sense, although the patient maintains adequate verbal fluency, its use is often realized out of context, and it may be difficult for them to respect the turns of intervention or position themselves at conversation topic relation in a dialogue situation. Also, it presents difficulties to talk about a specific topic, moving easily from one topic to another, difficulties in maintaining a conversation or structuring the speech in a logical or sequenced way, alterations in the non-verbal elements of the conversation, providing excessive information or redundancy, difficulties in placing oneself in the interlocutor place, terminology inappropriate use in relation to the conversation, as a consequence of difficulties communicative competence level, understood as the ability to identify the interlocutor's needs or messages and adapt their responses to listener's demands.

## **5. CONCLUSION**

The results obtained at the sociodemographic level do not differ from those reported in the literature in relation to gender, age, socioeconomic and educational level, the helmet use as a personal protection element and frequency of involvement in the vehicle occupants. Similarly, it is agreed that traffic accidents are the main causes of head injuries.

In relation to the clinical characteristics, the lobes most susceptible to a traumatic brain event are the frontal and temporal, which generates significant alterations in the language comprehension and expression tasks, as supported by the literature. However, these conditions will depend on the affected hemisphere and the injury severity. Likewise, mild TBI is reported as the most frequent case; data that coincides with related research, as well as the predominance of closed TBI.

On the other hand, when referring to the expressive and comprehensive language characteristics in the sample evaluated with TBI, it was shown that, in general, for all the mentioned components tasks, many patients presented conservation and only a minority reported alterations. This is according to the percentiles that determined their performance. This is justified by the high percentage of cases with mild TBI.

When analyzing the linguistic errors by traumatic brain injury severity, it is concluded that at the mild TBI level, there was little commitment in an expressive nature compared to a comprehensive type. For the moderate TBI, the presence of errors concerning both linguistic dimensions were exhibited, as in the severe TBI, showing in the latter a higher complexity rate in the errors presented, given the severity of their injuries.

Finally, in a general way it is concluded that the traumatic brain injuries generated the comprehensive, expressive, and mixed language alteration and at the language use level. Similarly, commitments at the social, family, and economic level, affecting the patient quality of life. Situation that causes a great social impact, considering the frequency with which events are occurring in productive ages, representing an economic imbalance not only for the people involved, but also for the state and health entities.

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